

BOOK OF ABSTRACTS



13TH MEETING OF
YOUNG RESEARCHERS
OF UNIVERSITY OF PORTO

**ENCONTRO
INVESTIGAÇÃO
JOVEM**

**12.13.14
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2020

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**UNIVERSIDADE
DO PORTO**

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CREDITS

Livro de Resumos do 13.º Encontro de Jovens Investigadores da U.PORTO

Universidade do Porto

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PROGRAM

WEDNESDAY, 12 th		THURSDAY, 13 th		FRIDAY, 14 th	
08:00 > 09:00	REGISTRATION	08:30 > 09:00	REGISTRATION		
	PARALLEL ORAL SESSIONS I		PARALLEL ORAL SESSIONS V		PARALLEL ORAL SESSIONS IX
	A1 - Sport Sciences I		A1 - Sport Sciences III		A1 - Agro Food I
09:00 > 10:30	A2 - Engineering I		A2 - Astronomy		A2 - Arts I
	A3 - Sciences of Education I		A3 - Criminology		A4 - Biological Sciences I
	A4 - Health Sciences I		A4 - Health Sciences V		A5 - Language Sciences I
	A5 - Architecture I		A5 - Architecture IV		
10:30 > 11:30	POSTER VIEWING & Coffee Break				
	PARALLEL ORAL SESSIONS II		PARALLEL ORAL SESSIONS VI		PARALLEL ORAL SESSIONS X
	A1 - Sport Sciences II		A1 - Sport Sciences IV		A1 - Agro Food II
11:30 > 13:00	A2 - Engineering II		A2 - Maths & Physics		A2 - Arts II
	A3 - Sciences of Education II		A3 - Psychology I		A3 - Psychology III
	A4 - Health Sciences II		A4 - Health Sciences VI		A4 - Biological Sciences II
	A5 - Architecture II		A5 - Architecture V		A5 - Language Sciences II
13:00 > 14:30	Lunch Break				
	PARALLEL ORAL SESSIONS III		PARALLEL ORAL SESSIONS VII		PARALLEL ORAL SESSIONS XI
	A1 - Chemistry I		A1 - Chemistry III		A1 - Agro Food III
14:30 > 16:00	A2 - Economics & Management I		A2 - Psychology II		A3 - Psychology IV
	A3 - Sciences of Education III		A3 - Literary Studies		A4 - Biological Sciences III
	A4 - Health Sciences III		A4 - Health Sciences VII		A5 - Language Sciences III
	A5 - Architecture III		A5 - Environment I		
16:00 > 17:00	POSTER VIEWING & Coffee Break				
	PARALLEL ORAL SESSIONS IV		PARALLEL ORAL SESSIONS VIII		
	A1 - Chemistry II		A1 - Chemistry IV		
17:00 > 18:30	A2 - Economics & Management II		A2 - Law		
	A3 - Socio-Cultural Studies		A3 - History & Museology		
	A4 - Health Sciences IV		A4 - Environment II		

FOREWORD

Os números falam por si. O IJUP'20 conta com cerca de 900 inscritos e acolhe 487 comunicações (279 orais + 208 posters). O encontro de investigação jovem da U.Porto volta a mobilizar inúmeros estudantes, a suscitar o interesse da comunidade académica e a revelar uma excelente dinâmica de produção científica. Ótimas notícias, sobretudo tendo em conta a intenção estratégica da Equipa Reitoral de tornar a U.Porto numa instituição eminentemente vocacionada para a investigação científica de topo.

A concretização deste objetivo passa, em boa medida, por fomentar uma cultura de investigação entre os nossos estudantes. Neste sentido, estamos apostados, por um lado, em criar na comunidade estudantil uma maior apetência pela investigação e, por outro, em promover a integração de jovens investigadores nos nossos centros de I&D. O talento jovem é fundamental para o ecossistema de ciência e inovação da U.Porto.

Neste quadro, o IJUP assume-se como um instrumento fundamental para desenvolver o mindset dos estudantes e criar rotinas de comunicação, reflexão e debate de projetos científicos. O IJUP é, de facto, um espaço privilegiado para os estudantes mostrarem publicamente os resultados das suas investigações, treinarem a apresentação de comunicações científicas, debaterem questões metodológicas e partilharem conhecimento numa lógica multidisciplinar.

Tudo isto se verifica no IJUP'20, que desta forma proporciona aos participantes uma estimulante experiência de imersão num ambiente em tudo semelhante ao de um grande congresso científico. Este tipo de experiência vai preparar os estudantes para uma potencial carreira na investigação e ajudar os participantes a desenvolverem um conjunto de competências transversais tão valorizadas nos dias de hoje.

Por tudo isto, não quero deixar de agradecer a todas as pessoas envolvidas na organização do IJUP'20, desde o staff técnico superiormente liderado pelo Sr. Vice-Reitor Pedro Rodrigues aos docentes do comité científico responsável pela análise dos projetos selecionados.

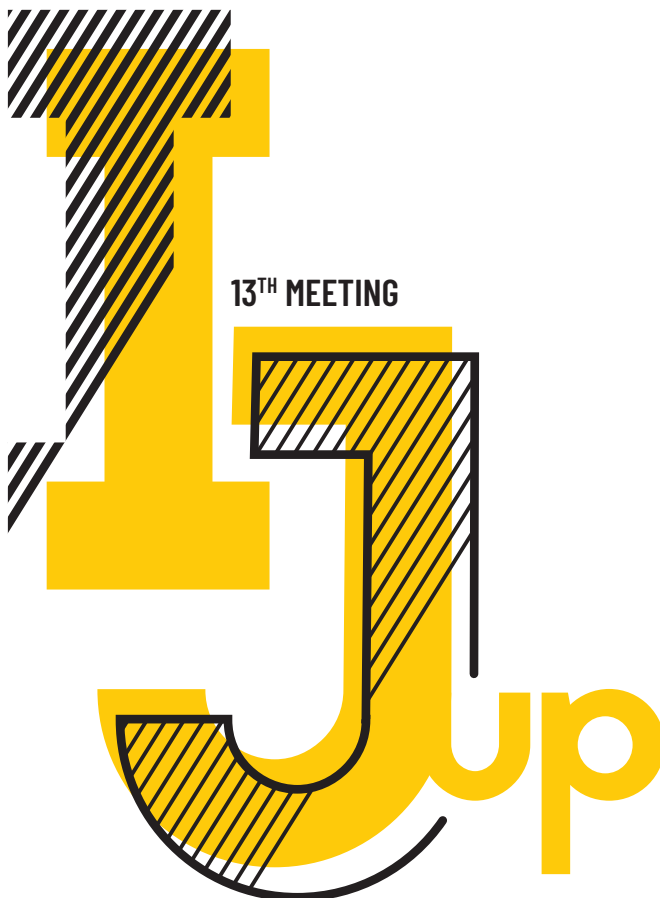
Uma palavra de reconhecimento também para o Santander Universities, que uma vez mais nos apoia na organização do IJUP.

Por fim, impõe-se uma saudação muito especial aos estudantes e aos restantes autores dos projetos apresentados no IJUP'20, a quem desejo as maiores felicidades académicas e sucessos científicos.

António de Sousa Pereira

Reitor da Universidade do Porto

ORAL SESSIONS



- 16538 | 3D Spheroids as an in vitro model to study Prostate Cancer cell lines' behavior

Moreira-Silva, Filipa, IPO-Porto, Portugal

Camilo, Vânia, IPO-Porto, Portugal

Gaspar, Vítor, CICECO-Universidade de Aveiro, Portugal

Mano, João F., CICECO-Universidade de Aveiro, Portugal

Henrique, Rui, IPO-Porto & ICBAS-UP, Portugal

Jerónimo, Carmen, IPO-Porto & ICBAS-UP, Portugal

Prostate cancer (PCa) is the second most common malignancy among men and the fifth leading cause of cancer-related death worldwide. Patients that progress to a castration-resistant prostate cancer do not benefit from any effective treatments, being in vitro studies an important method of drug screening. However, the traditional 2D cell culture method does not mimic the tumor microenvironment. Therefore, more appropriate and complex cellular models are required to better represent human physiology and disease, such as 3D spheroids.

We aimed to establish 3D cell spheroids with different PCa cell lines in order to mimic in vivo features that allows a more accurately drug screening.

Standard 96 well Flat Bottom Plates were coated with 1.5% agarose in culture medium. Afterwards, different PCa cell lines (DU145, PC3, PC346DCC, RWPE) and a non-malignant stromal cell line (WPMY-1) were cultured at different cellular concentrations. The cell spheroids were then monitored during 11 days in order to verify spheroid area and the presence of a necrotic core.

All tested cell lines formed round 3D spheroids after 3 days of incubation, excepting PC3. Since in Primary PCa there is not a necrotic core, we selected the cellular concentration that prevents the establishment of a necrotic core during 11 days. Regarding PC3, grape-like spheroids were formed at a concentration of 250 cells per well (c/w). Concerning the other cell lines, we verified that for DU145 a cellular concentration of 500 c/w and 1000 c/w allows spheroid formation without a necrotic core. For PC346DCC, 250 c/w allowed a round spheroid formation. Regarding non-malignant cell lines, the most appropriated cellular concentration for RWPE was 500 c/w, whereas for WPMY-1, 250 c/w allowed spheroid formation.

We were able to establish 3D spheroids from different Prostate cell lines. This new approach is a promising tool for the screening of potential new drugs, once it better resembles in vivo tumors.

- **16551 | Experimenting with RF-433MHz for Low-Cost Short Range for Edge Device Communications**

Barros, Filipa S., Faculdade de Engenharia da Universidade do Porto, Portugal

Graça, Paula A., Faculdade de Engenharia da Universidade do Porto, Portugal

Mendonça, Helio S., Faculdade de Engenharia da Universidade do Porto, Portugal

There has been an increased research effort in the design of new communication protocols given their use in smart object intercommunication. However, the viability of using short wave and radio frequency communications has been mostly overlooked even given its advantages, such as low battery consumption, low price, and implementation simplicity, in situations where reliability is not a priority.

Commonly used in consumer-level products such as garage controls and wireless alarms, the goal of this experiment is to assert the practical applications of 433MHz communication modules, exploring the capabilities of RF communication in edge device communications.

Two Chipkit Uno32 equipped with 433MHz transceiver modules were used to build a simple proof-of-concept (PoC) of a two-way message transmission device. This PoC consists of a simple message passing between two devices. The messages were expressed in any format (in this case, Morse code), encoded in binary strings and then transmitted using the RadioHead Arduino library. Two auxiliary antennas were used to increase the communication range of the modules.

The use of antennas increases the electromagnetic field created by the communication modules, thus increasing the communication range. During the experiments, this was observed: (1) the use of antennas with 8.6cm (i.e. $1/8$ wavelength) assure communication up to 7 meters and (2) the use of antennas with 3cm (i.e. $1/4$ wavelength) ensures communication up to 12 meters. Further, the communication baud rate was measured with an oscilloscope, with the approximated result of 10kHz.

The set of experiments allows us to conclude that the use of RF 433MHz is suitable for edge device communication for more complex systems, such as in Internet-of-Things products.

- 16552 | Love relationships between inmates: a heteronormative homosexuality?

Canha, Laura N., Faculdade de Psicologia e Ciências da Educação da Universidade do Porto, Portugal

Oliveira, Alexandra, Faculdade de Psicologia e Ciências da Educação da Universidade do Porto, Portugal

Sexuality between female inmates is a poorly addressed issue in the scientific community, mainly due to the assumption of this theme as a taboo. However, same-sex relationships in confinement have been considered a coping mechanism to deal with the deprivations of reclusion, being seen as situational homosexuality, and reproducing heteronormativity.

This research aimed to understand the perceptions of inmates in intimate relationships, regarding their involvement, and specifically the motivations, gender roles, dynamics and meanings of the relationships.

We used a qualitative methodology, via semi-structured interviews, with fifteen female inmates of a Portuguese prison, involved in loving relationships with other female inmates. Subsequently, data were subjected to a categorical type of content analysis.

The results show that only a minority of interviewees perceived their relationship as associated to situational factors or coping mechanisms. Most of them admit the possibility of maintaining their relationship after seclusion, and name love/passion and/or attraction as motivations for the relationship. Although these relationships may mirror heteronormative roles (butch and femme), the reproduction of these roles does not occur, either in the perceived power in the relationship or in sexual practices.

We conclude that situational factors are not the focus of the establishment of these relationships, and that the reproduction of gender roles occurs only externally. Despite the specificities, the relationships are characterized by motivations and dynamics independent of context or sexual orientation.

We hope that this study, by showing a reality without visibility and giving voice to inmates, will allow a better understanding of these relationships and their benefits and may lead to the improvement of life during imprisonment.

Keywords: Sexuality, female imprisonment, love relationships, sexual orientation, gender roles.

- **16553 | The Cross-Competences and Employability of University of Porto Graduates**

Santos, Tiago N.C., Faculdade de Economia da Universidade do Porto, Portugal

Currently, there is a concern in the development of cross-competences due to their importance and valorization in the labor market, perceived as decisive for the graduates professional future and employability (Cardoso et al., 2014; Evers et al., 1998; Parente, 2017; Rocha et al., 2012).

The aim of this study was to analyze the self-assessment of university graduates about their transversal skills considered essential for employability.

The sample consists of graduates from the University of Porto (n = 145), considering that the moment of completion of the academic degree has already occurred, up to a maximum of 5 years, and that many of the former students have already started their professional career in the job market.

This sample includes all graduates from different academic fields, regardless of enrollment. The Evers, Rush and Berdrow questionnaire was used to assess graduates' transversal competences and to divide them into four groups, considered as essential for employability (Evers et al., 1998). In order to know the perceptions of the graduates of the University of Porto, it was decided to conduct a questionnaire survey, administered electronically. In this information collection instrument, a set of sociodemographic, academic and professional questions were also inserted. Data analysis was performed using descriptive and inferential statistics using the SPSS-24.0 (Statistical Package for the Social Sciences) software.

The results found were as follows: Masters graduates have higher results in self-assessment of personal skills compared to those who have a degree; men and women do not distinguish themselves in the perception of transversal competences; there is a positive relationship between the number of years since graduation from college and some cross-cutting skills (creativity, innovation and change and personal skills) and finally there is a positive relationship between monthly net income and cross-competence skills.

- 16558 | Chronic skeletal muscle damage induced by a demanding physical training is not a major physiopathological factor for overtraining development in Wistar rats

Leite, Francisco, Faculdade de Desporto da Universidade do Porto, Portugal

Bovolini, Antonio, Faculdade de Desporto da Universidade do Porto, Brazil

Costa, Catarina C., Universidade de Aveiro, Portugal

Duarte, José A., Faculdade de Desporto da Universidade do Porto, Portugal

It is believed that successive muscle damage accumulation due to the training overload is the origin of overtraining syndrome (OTS). However, there is no scientific direct evidences associating the chronic structural muscle damage induced by training overload with the occurrence of OTS. Therefore, this study tests the conjecture that a successive accumulation of muscle damage owing to the training overload is in the OTS origin, using the soleus (SOL) and tibialis anterior (TA) muscles of Wistar rats exposed to a demanding exercise training protocol. Animals were randomized grouped in the control group (CG, n=5) or in the exercised training group (EE, n=10). The EE group performed a treadmill running training (-20°; from 25m/min, with progressive increase of 1.25m/min per day) for 60 min/day, 6 times/week. The animals were sacrificed 1 (EE1, n=5) and 3 weeks (EE3, n=5) after the beginning of the training program. Food intake, body weight, ability to perform work, hair appearance, and animals' behavior were measured during the protocol. After sacrifice, SOL and TA muscles were prepared for histological analysis. Both showed muscle damage signs in EE1 and EE3 through the increase of tissue necrosis, cell degeneration, and inflammatory activity. Nevertheless, the exercise training protocol was not able to induce OTS. Simultaneously to the occurrence of muscle injury, the exercised muscles exhibited adaptative signs, such as enhanced collagen content and cross-sectional area. In conclusion, the great amount of chronic muscular damage in SOL and TA is not associated with the OTS in the short and medium-term. Moreover, muscle damage demonstrates different behaviors according to the type of work that each muscle performs, questioning the use of systemic markers of muscle damage as reliable indicators to study the relationship between skeletal muscle damage and OTS.

Key words: TRAINING OVERLOAD; MUSCLE INJURY; ECCENTRIC EXERCISE; SOLEUS MUSCLE; TIBIALIS ANTERIOR MUSCLE;

- 16559 | Mea culpa, mea culpa, mea maxima culpa: neoliberalism, psychologization and scientific research

Araújo, Hugo, Faculdade de Psicologia e Ciências da Educação da Universidade do Porto, Portugal

The present study explores the relationship between the neoliberal paradigm - effectively seen in the Universities' new public management (NPM) - and the psychologization phenomena, with the intent to raise the scientific and general communities' awareness about the growing instrumentalization of Psychology and knowledge's commodification, particularly in the scientific research. Thus, we explored the Center for Psychology at University of Porto's functioning dynamics interviewing twelve researchers belonging to this center and understanding the data through a thematic content analysis. The confirmation of the research questions allowed us to conclude that the neoliberal ideology, by the implementation of the NPM, enters the scientific research exalting the technocratic and efficient criteria, promoting psychologizing discourses that, in their turn, occupy the public arena. Furthermore, this pioneer exploration in Portuguese context allow us to realize that, although there's a preference for Anglo-American Mainstream Psychology, there's a clear investment in research diversity, for both theory and methodology.

Key words: Neoliberalism, Psychologization, Scientific Research, New Public Management.

- **16560 | Training of the technique running in prepubescent soccer - effects on velocity and agility**

Brusin, Bruno B., Faculdade de Desporto da Universidade do Porto, Brazil

Rebelo, Antonio N., Faculdade de Desporto da Universidade do Porto, Portugal

The present study aimed to verify the effect of the training of the running technique on the speed and agility of prepubescent soccer players.

The study lasted 12 weeks, in which two groups (experimental and control) were submitted to different training programs. The experimental group conducted 3 practices of running technique and 3 specific soccer practices per week, while the control group performed only the 3 specific weekly football practices. A homogeneity test was performed in order to ensure that there were no significant differences between the groups.

All athletes were subjected to speed and agility tests before and after training programs. The speed test consisted of a 30-meter sprint with a speed assessment at 10 and 30 meters. As an agility test we used arrow head, held left and right. The tests were performed on synthetic grass, using photoelectric cells to measure the test time.

The results of this work showed that the control and experimental groups improved their performance ($p < 0.05$) in speed and agility tests after 12 weeks. For the moment x group interaction we obtained the following significance values: velocity at 10 meters (0.79), speed at 30 meters (0.63), agility to the right (0.72) and agility to the left (0.83). therefore, there were no significant differences in the magnitude of evolution of each of the groups.

In conclusion, the training of the running technique did not influence the speed and agility performance of footballers at prepubertal ages.

- 16561 | Parallelisms in Almada Negreiros' work

Silva, Clara M., Faculdade de Letras da Universidade do Porto, Portugal

Having been published recently (2015), «O Pierrot que nunca ninguém soube que houve» (1921-2) is a hybrid text that combines drawing and calligraphy. Taking into consideration the equivalent techniques and combining processes that can coexist in painting/ drawing and in verbal art, it is our main goal to study the distance and/or contact points in Almada Negreiros' work. The chosen *corpus* has evident intermediality marks, being the simultaneous contrasts studied by Sonia and Robert Delaunay the main transmedial technique triggered. In this context, simultaneous contrasts are not only conceptualized as the contrast between different colours. A possible definition would be the opposition between two different elements - visual or verbal - that prolong and/or enhance our perception. Examples shown in «O Pierrot que nunca ninguém soube que houve» are 1) its subtitle «Tragedia ilustrada com sol e palmeiras» and the green and lilac colours. Both visual or verbal opposite elements, when put in contrast, seem to have the immediate effect known as «defamiliarization»/«ostranenie» or «estrangement» formulated by Viktor Chklovski.

Keywords: Intersemitotics, sign, word, image, parallelism.

- 16568 | Writing as a process: Some experiences with pre- and post-writing activities

Hamivka, Andriana, Faculdade de Letras da Universidade do Porto, Portugal

This study aims to highlight the importance of pre and post-writing activities in the quality of written expression of secondary school students. Developed within the pedagogical internship of Portuguese and English teaching, this study, respecting the principles of an action research project, starts from a theoretical approach that advocates the relevance of writing, its models, the teacher's role in teaching and learning the writing skill, the evaluation of the texts produced and the notion of error. The reflection on this theoretical ground is the basis for the creation of a wide range of practical activities, described and analysed in this study, and applied to the conducting of the classes during the pedagogical internship. The work we designed and the strategies we used do not completely solve students' writing problems, but they are a contribution to making them aware of the characteristics and sensitive areas of their writings in a more targeted and engaging way. Writing is a difficult but rewarding process.

"Saber existir pela voz escrita", as stated by Pessoa (2014: 341), although gratifying, is not an easily accessible task, therefore it is important that students face difficulties inherent to the writing process in the school context, and know how to find motivation and willingness to progress. This development will always be unfinished, as each new level introduces "a new ignorance" (Rancière, 2010:20). Walking the paths of writing does not imply going through a process that Amor (2001: 168) describes in the following way: "único e linear, num percurso com hora de partida e chegada. Sempre sem saber exatamente quando e onde chegar." This project focuses on the awareness of the steps that frame the writing, in order to, in a motivating environment, improve the quality of the texts displayed by the students, and cultivate their taste for writing, goals we consider achieved, as their texts reveal great improvements, although there is still much to explore.

- **16572 | The incubation and graduation of enterprises: cases of success and failure**
Alegre, Teresa C., Faculdade de Letras da Universidade do Porto, Portugal

The competitiveness patterns changed since the last two decades of the twentieth century. It has been, among other factors, the origin of new ways of entrepreneurship. In this framework, the business incubators emerged in Europe as a new way of promoting entrepreneurship, developing innovation and boosting enterprises. Incubators and incubation's programs also emerged in the academic context allowing the transfer of scientific knowledge into the market, namely in Scientific and Technological Parks.

This study is focused on cases of success and failure of graduated enterprises that have gone through an incubation period. A mixed research is made, through a multiple case study, on enterprises that developed their business projects at the University of Porto Scientific and Technological Park - UPTEC. The main goal is understanding the role of the incubation's influence, in medium and long-term, for the survival and sustainability of enterprises.

The relevance of this study points to the fact that there isn't yet a systematic and in-depth analysis of the enterprises' performance and sustainability after the programs as well as of the influence and impacts of incubation during the post-incubation period.

Acknowledgments:

Master Thesis Dissertation in Sociology, Faculty of Arts and Humanities, University of Porto

- 16573 | Application and exploration of machine learning algorithms to longitudinal data

Garcia, André, Faculdade de Ciências da Universidade do Porto, Portugal

Costa, Joaquim, Faculdade de Ciências da Universidade do Porto, Portugal

With the increasing incidence and prevalence of diseases, cohort studies are becoming indispensable tools in fields like epidemiological research. This type of study is a particular form of a longitudinal study, in which measurements are not restricted to single variables and they can be seen as a vector of repeated measurements over time, thereby producing trajectories. Thus, it's important to study and analyze the existence of homogeneous subgroups of individuals trajectories. This helps to identify relevant trajectories patterns and track individuals who are very likely involved in the same or similar processes. In case of large data sets, using supervised classification solutions is almost unfeasible, but on the other hand, unsupervised approaches such as clustering can get good results. For such analysis, we will work with several clustering types such as partitioning, model-based, hierarchical and soft-clustering methods. More specifically, we will use K-means with Euclidean and Fréchet distance, the methods developed in [2], a new mixture of models for the model-based clustering introduced in [3], the mixed effects model with embedded smoothing splines introduced in [4] and the hierarchical clustering. These methods will be compared to each other in artificial and real datasets (like the ones used in [2] and more). We will also look into the criteria that determinates the optimum number of clusters and try to come up with something new (still future work to be done).

[1] James Ware Garrett Fitzmaurice, Nan Laird. *Applied Longitudinal Analysis*. John Wiley & Sons, Inc., New Jersey, 2004.

[2] Joaquim Costa, Martina Mascarello, Ferreira, Rita Gaio. Some Developments in the Clustering of Longitudinal Trajectories (Submitted)

[3] P. McNicholas, B.Murphy. Model-based clustering of longitudinal data. The Canadian Journal of Statistics

[4] Monica Golumbeanu et al. Proteo-Transcriptomic Dynamics of Cellular Response to HIV-1 Infection. Nature Scientific Report

- **16574 | Development of a Mentoring project in the 2nd and 3rd CEB: A Deliberate Psychological Education approach**

Brigas, I., Faculdade de Psicologia e Ciências da Educação da Universidade do Porto, Portugal

The mentorship project presented here was developed under the Deliberate Psychological Education Model (DEM) and the structural-cognitive conceptual approach. In this project 9th graders were provided with training sessions during the 1st term of the school year that were designed to enable them to mentor 5th grade students during the 2nd and 3rd term of the school year. These 5th graders were transitioning from elementary schools to a new school (EB 2,3) and came from vulnerable families, a factor that has detrimental psychological consequences on the students' adjustment to a new school context. This project used a quasi-experimental methodological design comprising an experimental group (the mentors) composed of seven 9th graders from two classes of the same school. These were divided into three sub-groups, each of which was assigned to a group of four or five mentees, all of whom came from the same 5th grade class. The pre-test and post-test of this design comprised a questionnaire intended to evaluate the efficiency of the intervention based on a set of inter and intra personal skills (for the 9th graders: communication, altruism, civic responsibility, critical thinking, personal responsibility, leadership, decision making, self-esteem, satisfaction with school; for the 5th graders: altruism, civic responsibility, personal responsibility, perception of support, self-esteem, satisfaction with school). The mentors group was subjected to several qualitative assessment tools, namely observation, gathering of data from their journals and questionnaires comprising both open and closed ended questions. A process evaluation was developed. Results point towards a high impact in terms of general psychological development in all the mentors and across several soft skills. The impact on the mentees varied according to the level of their involvement on the project and whether a close relationship with a mentor had been formed.

Keywords: Deliberate Psychological Education

- **16575 | Architectural Photography: A Singular Visual Narrative Device**

Paulos, João, Faculdade de Arquitectura da Universidade do Porto, Portugal

Leão Neto, Pedro, Faculdade de Arquitectura da Universidade do Porto, Portugal

Photography, from its inception, has been associated with architecture for a large number of people. From the twentieth century, with the rapid spread through the media, and because it became a tool that was available to a large part of society, photography makes the world of architecture accessible to a large number of people, shortening the distance to the oeuvre. The experience and direct contact with architecture lose relative importance, since photography is able to visually register this reality with unparalleled similarity. But also, it aroused the curiosity of many to visit the works, as well as allowing people to be informed about some of these architectures without having to physically visit them.

The main focus of this study is to understand how it is possible to use architectural photography beyond the object of registering the work, as a document, but also as a kind of sensitive register, capable of awakening in the viewer a moment of reflection on an architectural space, leading him to wonder about it. Moreover, this more disciplined perspective gives the architect an awareness of how space is really appropriated and explored by its users.

Through a visual and critical poetry, photographers Iwan Baan and Nuno Cera portray problems of the modern city through their photographs. They create a visual narrative that takes the viewer on an introspective journey into these subjects and spaces, which are often of his knowledge, but which are shown from a new critical and methodical point of view that instructs him to a new reality. Therefore, these authors are case studies and, together with the literary review of this work, they are the foundation and references for a photographic investigation project associated with the VSC Project.

This case study is the practical object where the author tries to apply an architectural photography model on the different dynamics and transformations of the metro station spaces of the Porto metropolitan area.

- 16576 | “Being busy is the only way to recover”: occupation and employment influence in drug misuse recovery

Leite, Ângela S., Faculdade de Psicologia e Ciências da Educação da Universidade do Porto, Portugal

Cunha, Ana C., Faculdade de Psicologia e Ciências da Educação da Universidade do Porto, Portugal

Gonçalves, Filipa, Faculdade de Psicologia e Ciências da Educação da Universidade do Porto, Portugal

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Pinto, Marta, Faculdade de Psicologia e Ciências da Educação da Universidade do Porto, Portugal

Literature has identified the importance of social context in drug misuse recovery process. So, it's crucial to consider factors related to socio-environmental conditions, such occupation that is essential for a successful recovery. This research is inserted in an european project, D.U.R.E.S.S. (Drug Use Recovery, Environment and Social Subjectivity), funded by SICAD (General Directorate for Intervention on Addictive Behaviours and Dependencies) and emerged in the ambit of ERANID European project. It intends to understand the influence occupation has in drug misuse recovery, what are the useful occupations on recovery and what are the main difficulties and benefits of having an occupation. Each of the nineteen participants on the methadone program kept a health diary for approximately six months, where they registered all the ideas they had about occupation. Data were analyzed through thematic content analysis. The results suggest that occupation is a very important influence in drug misuse recovery. The most important ones were employment, courses and occupation activities. These eases recovery, allowing drug users to be busy and don't think about drugs. On top of that, they also provide stability to people who use drugs, increasing their responsibility, self-realization and social contact, while they can learn and feel integrated in society. During the same process they felt some difficulties, such as the relationship with colleagues, tiredness, stress and lived injustices, namely related to schedule. Occupations should be interesting and aligned with their need, while treatment centers should create them to develop competences and skills on people who use drugs.

Key words: occupations; employment; recovery; rehabilitation; drug misuse.

- 16577 | Parental Intentions, Pathways to Parenting and Experiences in the Health Services of Trans People in Portugal

Marinho, Inês, Faculdade de Psicologia e Ciências da Educação da Universidade do Porto, Portugal
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There is very little research that has been conducted regarding parenting in trans or non-binary people in the Portuguese context. This study intends to explore parental intentions and the methods chosen to achieve parenting in self-identified trans or non-binary individuals. Furthermore, it aims to understand how health services are helping them in this area, by studying the experiences of these people in these services. This is a qualitative study, relying on the discussion occurred in four focus groups as a method of data collection, and on content analysis for its subsequent treatment. Thirteen people self-identified as trans and as non-binary, with ages between 19 to 43, and with diverse sexual orientation participated in the study. Through analysis, Parental Intention, Methods to parenthood and Experiences with health service were identified as primary categories. It was found that half of the participants in the sample wanted to become parents in the future and the vast majority of the others had an indefinite position on this subject. Adoption was the preferred method by the sample concerning the achievement of parenting, contrary to the sexual intercourse. All participants reported being informed about the reproductive consequences related to gender-affirming procedures. A lower percentage was clarified on the possibility of preservation of fertility, despite the fact that majority of the sample did not consider acting upon this option. The delay of the medical procedures, the lack of preparation and formation of professionals prepared to work with trans people, and the use of cis terminology and inadequate gender identity pronouns were the highlighted by the participants as promoters of negative experiences through the processes of gender transition and sexual reassignment. The results of this exploratory study provide relevant information for professionals who intervene with trans population.

- **16579 | INTEGRATION / ADAPTATION / RECONVERSION Urban planning of the coastline facing the rise of sea level applied to Vila Chã**

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The purpose of this investigation stems from personal interest in understanding the recent dynamics that devastate the Portuguese territory, particularly the coastal landscape, with the recent concerns in relation to coastal villages with the risks of rising sea water levels (foreseen by the reports of the International Panel on Climate Change, NASA, etc.) as well as the worsening coastal erosion identified by the Portuguese Environment Agency. In this way, the role of the architect as a re-organiser of urban space is reviewed, reflecting on how to prevent changes in a work process and the design of strategies, in order to protect the natural heritage, built heritage and the communities.

In this way, the study of the controversial national Coastal Shoreline Programme, which will be soon implemented in Northern Portugal, becomes essential. The programme not only calls into question the displacement of the inhabitants of their area of residence, but also the disappearance of part of human relations with the territory. As it happens in Praia and Facho located in Vila Chã (Vila do Conde), where the continuity of the artisanal fishing is hindered and part of the centennial landscape of the "sea houses" eradicated.

As such, the Portuguese context and its situation aggravated by the lack of planning, with the intention of creating an intervention strategy, through the study of possible scenarios of action in the coastal territory, are discussed. Recognizing that an effective strategy does not only reflect on the technical aspects of risk mitigation as it may result in an acceptance by the population leading to stagnation of the process one one hand, or the extinction of the fishing community of Praia and Facho on the other, it is proposed to take a strategic view based on the preservation of local identity, valuing it in the same way that it integrates, adapts and reconvertes in a resilient territory, thus applying it to the practical case - Facho and Praia in Vila Chã.

- 16581 | The Relation of Contrast and the polarity change in sentences and adjectives

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The aim of the present study, of a semantic nature to correlate the Relation of Contrast (Kehler, 2002) with the polarity change in sentences and in adjectives. With this in mind, we constituted a corpus of 50 books reviews, written by non-professional critics, that were published on two Portuguese blogs (O sabor dos meus livros and Mente literária) and a website (Goodreads).

Although this textual genre has been the object of study of several works mainly concerning to film reviews (cf., for example, Silva et al. 2015; 2018), we did not find any research concerning the European Portuguese (EP) that, on the one hand, focuses on the characteristics of books reviews and, on the other hand, on the rhetorical relations and sentiment analysis approach (here, we follow the Appraisal Theory, by Martin & White (2005)).

Thus, to analyze the role of Relation of Contrast (RC) in the polarity of sentences, we first annotated the polarity of the sentences under analysis and then annotated the polarity change operations according to the proposal of Trnavac et al. (2015) - Reversal, Intensification, No Change and Downtoning -, requesting the collaboration of three more EP native speakers to confirm my annotation.

As for the adjective polarity change parameter, we wanted to assess whether the adjectives change their polarity when they occur in one constituent that is connected to another by RC. For this, through a questionnaire answered by 93 Portuguese speakers, we obtained the primary polarity of the adjectives using the positive, negative and neutral values. From here, me and the three other native speakers, made the annotation of the polarity change operation.

Finally, we concluded RC influences the polarity of the sentence, but not the polarity of the adjectives in EP.

- 16582 | Space-Confined Physical Vapor Deposition of Ionic Liquids

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The superficial dynamics of ionic liquids (ILs) is one of the most important research areas concerning materials' chemistry due to their preferential location in confined spaces.[1-3] Two different anions ([OTF]⁻, [NTf2]⁻) were used to understand their effect on ILs dynamics. The physical vapor deposition for droplets and thin films of 1-ethyl-3-methylimidazolium bis (trifluoromethyl sulfonyl) imide ([C2C1im][NTf2]) and 1-ethyl-3-methylimidazolium triflate ([C2C1im][OTF]) onto polycyclic aromatic hydrocarbons (PAHs; pentacene, rubrene, perylene, among others) was performed. Physical vapor deposition, scanning electron microscopy, and UV-Vis spectroscopy were used for the morphological and optical characterization of thin films.

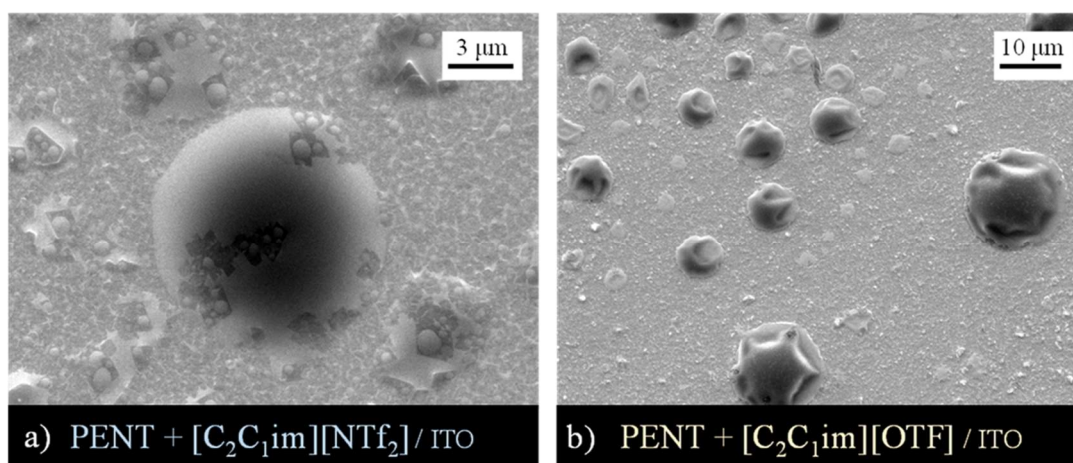
The ILs droplets presented different shapes and behaviors concerning their preferential location in confined spaces.[3] Sequential and simultaneous deposition of ILs with pentacene thin films (Figure 1) were explored in order to understand the nucleation and growth mechanisms for these mixtures. A molecular explanation of the nanostructures produced, considering the physical and chemical properties of the distinct anions, is proposed. The interpretation of the preferential location of the IL droplets into the PAHs confined spaces and their effect on PAHs crystallinity and film topography is presented. Moreover, metal-coated quartz crystal surfaces with high roughness were used as a source of confined cavities allowing to explore and formulate theoretical models for the ionic liquid dynamics onto space-confined surfaces.

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SEM images of mixtures of pentacene and ionic liquid prepared by simultaneous vapor deposition: detailed thin film morphology of mixtures of pentacene with [C2C1im][NTf2] (a) and with [C2C1im][OTF] (b).

- 16583 | Iodine food sources and iodine status of pregnant women of the IoMum cohort: the role of dairy products

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Introduction: The role of dairy products in the iodine supply to Portuguese pregnant women is unknown.

Aim: To evaluate the impact of dairy consumption on the iodine status of pregnant women of the IoMum cohort.

Methodology: Pregnant women were recruited at the time of the 1st fetal ultrasound scan at São João Hospital Center when they provided information on consumption of iodine-rich foods and a spot urine sample. Women with 10-14 weeks of gestation with confirmed fetal vitality and who signed the informed consent were included, while those taking levothyroxine were excluded (total n=468).

Urinary iodine concentration (UIC) was determined by inductively coupled plasma mass spectrometry (ICP-MS) according to the CDC's method 3002.1.

A logistic regression model was used to assess factors associated with low iodine levels with adjustment for several co-variables. Independent variables tested were milk, cheese and yogurt consumption frequencies. Differences were considered statistically significant whenever P value <0.05.

Results: Higher milk intake frequency was associated with higher UIC (P = 0.015), particularly in the non-iodine supplemented group (P = 0.002). In this group, women reporting consuming milk less than 3 times a month had a median UIC of 52 µg/L and only 8% reached the recommended values (≥ 150 µg/L). Milk consumption < 3 times a month by these women was associated with an increased risk of UIC < 50 µg/L [OR (95% CI): 2.93 (1.06-8.62)] and < 100 µg/L [OR (95% CI): 4.34 (1.50-12.64)]. The highest UIC (160 µg/L) was observed among supplemented women that reported consuming milk once a day. The consumption of yogurt and cheese did not affect the UIC of the studied population.

Conclusions: Milk, but not yogurt or cheese, showed a positive impact on the iodine status of pregnant women, mainly among those who did not take iodine supplements.

Trial registration number: NCT04010708.

- 16584 | Authentic language examples and materials on the development of pragmatic competence - the case of Portuguese as a foreign language
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Pragmatic competence, as part of several components that make up the knowledge of a language, is of increasing interest to researchers, teachers and learners on the context of the teaching and learning of a foreign language. However, its teaching and development are not yet, or not sufficiently, implemented when it comes to the case of Portuguese as a foreign language, as shown by teaching materials or by some guiding documents that help in the planning of curricula and classes. This work was carried out with students of Portuguese as a foreign language from levels A1 to B2, in a non-immersion context, in the Johannes Gutenberg-Universität in Mainz. The action-oriented research project has looked for ways and results of developing pragmatic competence in the students' foreign language through the use of authentic materials, specially through authentic informal conversation recordings, and through the contact with native speakers as providers of authentic live examples of language use. We tried not only to work on the pragmatics of oral communication, but also on the pragmatics of written communication, having used examples from online chats and social networks in order to teach students to interact in such contexts. The work shows how input provided by authentic materials and examples can be an essential tool towards developing the students' pragmatic competence in the foreign language, alongside with a more natural communicative competence, as proven by results obtained with students.

Keywords: Pragmatics, Portuguese as a Foreign Language, Authentic Materials, Native speakers

- **16585 | Memories to lose: A Farewell to some Heritage Sites?**

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Abstract: Memory usually goes hand in hand with physical reminders. Throughout history, every civilization engraved its right to be recalled and to transmit to future generations its elementary values at the cost of its creations. However, if time spreads a mystique aura it also carries numerous hazards, especially when it comes to cultural heritage. Loss of significance, neglect and conflictual interpretations are some of the threats related to cultural sites recognized as endangered. Besides, the increasing number of accidents and natural occurrences is harming cultural properties and imposing a new attitude. Although, most of the sites considered in risk by UNESCO remain in the List of World Heritage in Danger for years. Antagonistically, some are never inscribed as threatened. Considering the previous premises, we propose an analysis of UNESCO's List of World Heritage in Danger (2018-2019) having as main goal the comprehension of the hierarchies and dichotomies related to the safeguard, preservation, conservation and communication of different sites.

Keywords: Memory, Heritage, UNESCO's List of World Heritage in Danger.

- **16587 | Evolution of Learning Approaches aiming a better performance in Anatomy Education Courses**

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The current medical curricular reforms favoured the implementation of Computer-assisted Learning (CAL) as a pedagogical tool. Additionally, the paradigm of personalized and interact learning, brought by Learning Analytics, raised questions about how students' cognitive profiles influence their interaction with this new learning methods. Nonetheless, taking these profiles in consideration is vital for designing a learning environment that potentiates the learners' academic achievements. This study was conducted to understand how medical students' approaches to learning influence their adherence to CAL and their academic success in anatomy education. Thus, 671 medical students enrolled in Musculoskeletal (MA) and/ or Cardiovascular Anatomy (CA) courses were allocated to three groups (MA Group, CA Group, MA+CA Group). Students' main learning approach was assessed through Approaches to Study Skills Inventory for Students (ASSIST) questionnaire and they were invited to attend anatomy CAL training sessions during one-month period. Despite not assessing the evolution of learning approaches in a long-term, this study found a pattern of differences in learning approaches between MA and CA groups ($p < 0,01$). The MA+CA group didn't show statistically significant differences from either MA and CA groups. In all three groups, there were no statistically significant differences in attendance to training sessions between different learning approaches, suggesting that adherence with the CAL platform is independent from students' learning approaches. Therefore, CAL methodology is a reliable complement to the traditional medical curriculum that guarantees an egalitarian access to knowledge for the students. Also, medical students learning approaches seem to change from the first to second year. The reticence in changing learning approaches appears to be associated with higher failure to complete anatomy courses.

Key words: learning approaches; anatomy; computer-assisted learning

- 16588 | Walking ground reaction force prediction based on raw acceleration in normal weight to severely obese subjects

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Introduction: Currently, there is no way to objectively prescribe and monitor exercise for bone health improvement in obese patients based on mechanical loading intensity. Our aim was to develop accelerometry-based equations to predict peak ground reaction forces (pGRF) on normal weight to severely obese subjects. Methods: Sixty-four subjects (45 females; 84.6 ± 21.7 kg) walked at different speeds (2, 3, 4, 5 and 6 km.h⁻¹) on a force plate equipped treadmill while wearing accelerometers at ankle, lower back and hip. Regression equations were developed to predict pGRF from accelerometry data. Leave-one-out cross-validation was used to calculate prediction accuracy and Bland-Altman plots. Actual and predicted pGRF at different speeds were compared by repeated measures ANOVA. Results: Variables included in the final equations were body mass and peak acceleration. Our results showed that the coefficients of determination on all equations were above 0.89 and that Bland-Altman plots indicated a good agreement between actual and predicted pGRF. All models presented an accurate prediction, with a mean absolute percent error (MAPE) below 6.7% and a root mean square error below 104.1N. No significant differences were observed between actual and predicted pGRF for each walking speed. Accuracy indices from our equations were lower than previously developed equations for normal weight subjects, namely a MAPE approximately 3 times smaller, lower dispersion Bland-Altman plots and bias tending to zero. Conclusion: Walking pGRF in normal weight to severely obese subjects can be accurately predicted by accelerometry-based equations, representing an easy and accessible way to determine mechanical loading intensity in clinical settings.

KEY-WORDS: force plates; raw acceleration; gait; mechanical loading; activity monitor.

- **16589 | Physical Vapor Deposition of Organic Semiconductor Materials**

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This project aims the study of semiconductor thin films created by a physical vapor deposition (PVD) procedure and subsequent structural, optical, morphological and electrical analysis. Several compounds were studied, among which Alq3, NPB, spiro-TAD, and spiro-MeOTAD, which are of great importance to material science and which are used as charge carriers in OLEDs and OPVs.[1,2] Morphological properties like homogeneity, uniformity, and thickness of the films were tested by scanning electron microscopy. This analysis also enabled the determination of the existence of crystallization and granular formations. Optical properties were explored by analyzing UV-Vis spectra of the films for different thicknesses, and the band gap was calculated. The electrical properties were determined by I-V curves. A thermal stability study was made through two distinct techniques. The differential scanning calorimetry technique allowed the determination of the glass transition temperature, the melting temperature, the enthalpy of fusion and its associated entropy. The thermogravimetric analysis technique made possible the determination of the decomposition temperature of both compounds studied. Another of the central objectives of this project was to obtain gold nanofilms through the sputtering method, using a commercial sputter coater. Furthermore, an electric circuit capable of obtaining I-V curves for bilayers and multilayers and its corresponding data acquisition software were developed within this project.

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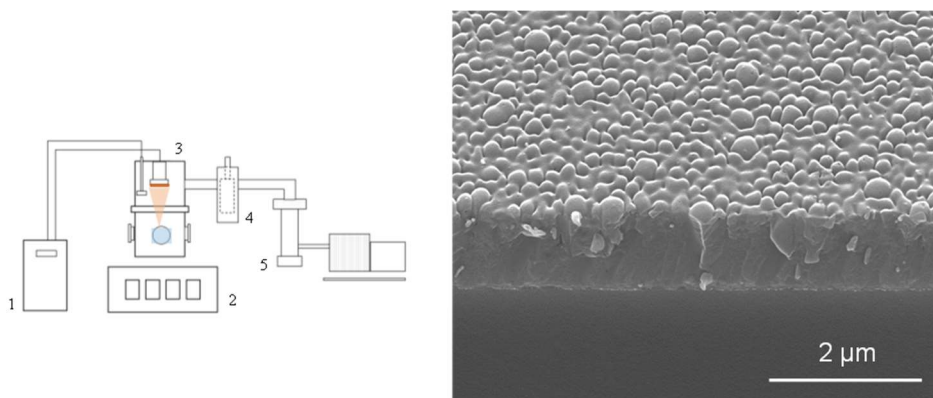


Figure 1. SEM image of a thin film of tris-(8-hydroxyquinoline)aluminum (Alq3) prepared by physical vapor deposition (scheme of the apparatus on left).

- **16590 | Alternative film exhibition in Portugal, 2007-2017: preliminary results**

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Film exhibition is fairly essential when it comes to culture, however there is still a lack of information about it, especially concerning the non-commercial circuits or alternative exhibition. In Portugal it is clearly a "minor" sector, with insufficient scale, public support and cultural visibility.

This master research is part of an ongoing project about "Non-Commercial Film Exhibition in Portugal" . The main motivation for this research was the possibility of contributing to the knowledge and understanding of how the non-commercial film exhibition sector operates, the agents involved, type of films that are exhibited, target demographic, place of exhibition and resources used.

One of the goals is to analyze statistical data from ICA (Portuguese Cinema and Audiovisual Institute) between 2007 and 2017. This data provides information about the agents, their location, screens, films, box office data, and public financing, among other variables, allowing to analyze different aspects of 'alternative' Portuguese exhibition, namely regional inequalities. Some preliminary results of this ongoing research will be presented.

Besides, recently, there have been slight changes in cinema and audiovisual policies which are central when it comes to European cultural policies. In Portugal, changes in public aid and policies regarding, art, cinema and digitization have been a current theme and a comparison with different European models is also of interest, so as to understand the effects public policies have on cinema.

This research will grant a deeper knowledge about cultural economics plus an outlook on non-commercial film exhibition and its impact on the economy as a whole.

- 16594 | A critical perspective of Portuguese cultural landscape management models

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Cultural Landscapes, inscribed on the UNESCO World Heritage List, are classified as having unique heritage values that justify their worldwide recognition. However, the great human pressure to which they are subjected to, both in the context of socio-economic and political development, requires that mechanisms be developed to ensure the safeguarding of the exceptional values that characterizes these *Sites*.

The Portuguese cultural landscapes, namely the Cultural Landscape of Sintra, the Alto Douro Wine Region and the Pico Island Vineyard Culture, are very different from each other, both in terms of size and the criteria that led to their inscription on the UNESCO World Heritage List. Assuming the essentially artistic character of the first, and the agricultural character of the following two, it is crucial that the bodies responsible for their management react in order to reconcile development interests with the preservation of cultural landscapes in a balanced way.

The main difficulties that Portuguese cultural landscapes currently face are the lack of recognition of the concept of Cultural Landscape in national legislation and, consequently, the absence of a model that presents guidelines for the management of these *Sites*. This legislative gap results in the use of heterogeneous territorial management or development tools, that are never fully suited to the management of cultural landscapes, as well as the different development of the respective management models. This divergence naturally assumes different results, with greater or lesser degree of achievement of the objective of safeguarding the inherent heritage values of each UNESCO classified Cultural Landscape.

The communication aims to present a comparative and critical reflection on the management models present in the three Portuguese cultural landscapes classified by UNESCO, giving orientations and suggestions for the improvement of each one of them.

- **16596 | New Developments in the Electricity Sector and their Impact on the Labour Market: Evidence from Portuguese Firms 2002-2017**

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Power systems have been suffering profound changes due to new developments in the electricity sector, namely decarbonization, decentralization, and digitalization. The study of the impact of these changes is of extreme importance since the electricity sector is one of the most important sectors in the economy, having great impacts on other sectors and societies in general.

Exploring a rich administrative matched employer-employee dataset - "Quadros de Pessoal" - this study provides a comprehensive characterization of the electricity sector in Portugal over the 2002-2017 period, aiming to evaluate to what extent changes in the sector is supported by the routine-biased technological change (RBTC) hypothesis.

The descriptive analysis shows that the liberalization in this sector did affect the industry structure, leading to the entry of new players and the downsizing of its workforce by the existing firms. At the worker level, the data indicate a decrease in employment share in routine (cognitive and manual) and manual task intense occupations and an increase in abstract occupations.

The econometric approach demonstrates that workers in routine cognitive task occupations are more likely to separate from the current firm than similar workers in other occupations. Regarding wage premiums according to occupation task intensity, the results reveal a clear positive trend in hourly wages for all occupations, except for those employed in routine manual tasks who experienced a lower wage growth in the 2002-2017 period.

The empirical results seem to support the RBTC hypothesis in the sense that we observe a substantial decrease in employment shares in routine cognitive occupations and a slight decrease in the rate of growth of wages of workers employed in routine task intense occupations compared to workers in abstract or manual occupations.

- **16600 | Writing workshops as a means to promote students autonomy on writing**
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The school is the institution that ensures the formation of active, critical and autonomous citizens (Portugal, Ministério da Educação, 2018a, 2018b), so it has the responsibility of teaching the knowledge and procedures necessary for students' future. These include writing as an activity necessary for today's social and professional life (Barbeiro & Pereira, 2007, p.5). The teaching of writing in Portugal begins with literacy, in the 1st cycle of education, and continues until the end of compulsory education, focusing on the mastery of various textual typologies, which allow students to write autonomously. This research project, carried out within the scope of the teaching practicum, has the main goal of promoting the autonomy of high school students in writing in Portuguese and in German. In order to achieve this goal, two intervention cycles were developed for each language, supported by a theoretical foundation that corroborates the relevance and urgency of writing pedagogy, oriented to the explicit work of writing in its different phases: planning, translating and reviewing (Flower & Hayes, 1980, pp. 12-13). The writing workshops (Calkins, 1989, Cassany, 1990, Vilas-Boas, 2003a), complemented by supporting writing strategies, was the methodology tested in this project. The results of this investigation, collected from the documentary analysis of the students' texts, the research diary written during the action cycles and the questionnaires applied to the classes, demonstrated the effectiveness of the writing workshops in raising awareness of the complexity of writing and promoting the autonomy of the students in writing activities.

Keywords: writing, text typologies, autonomy, writing workshop, process oriented.

- 16601 | The community(s) of the Monastery of S. Salvador de Travanca on the eve of its extinction: the (dis)uses of heritage.

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The benedictine community was one of the most influent monastic communities in Portugal and Travanca, a northern parish in Amarante, welcomed it for more than six centuries.

The relationships established between benedictines and the local community of Travanca are the motto of this communication and the reflection on the disuses/uses of the heritage created by both is a particular complement in this investigation. The jurisdictional and socioeconomic powers of the benedictine community shaped the cultural landscape of the coast-north of Portugal, through their directives and their influence on the spiritual and temporal ways of living. With the present study it was possible to verify the transformations that occurred in the surrounding space to the monastery in the late XVIII and early XIX centuries with special emphasis on the fence, the "passais", the "terreiro" and the water supply system.

For spatial perception of the socioeconomic power of the Monastery of S. Salvador de Travanca we have identified the annexed and presentation parishes, in which the monastery was charging the "foros", as well as the socioeconomic exploration units - of "casais".

Throughout the history of the monastic complex of Travanca there are several moments of heritage disuse, where we highlight the period after the extinction of religious orders and other more recent moments. At this point we reflect on the relevance of concepts such as "interpretation", "presentation" and "mediation" in heritage.

The action of preservation and mediation that we present at the culminating of this work is intended to involve the local community and public administration entities about the monastery's heritage, getting awareness to its sustainable maintenance and conservation, respecting the architectural, social, and spiritual memory of space, so that the monument remains alive and valued.

- 16602 | "TREMENDOUS" DISCOURSE STRATEGIES IN DONALD TRUMP'S POLITICAL INTERVIEWS

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According to Hoffman (2013: 472), in a political interview "the candidate is asked about his or her policy stances, and is then forced by the interviewer to defend those positions in the face of opposition". Authors, such as Deluca and Peebles (2002), claim that televised political discourse - just like political interviews - do not reflect rational debate, but rather, emphasize image, emotion, and style.

This study aims to present some of the linguistics features used by Donald Trump in political interviews, for the construction of the President's ethos authenticus.

Firstly, a written corpus was constructed: ten transcriptions of Donald Trump's political interviews, which occurred in 2018. Secondly, the work was undertaken through the study of diverse categories of linguistic analysis, using the computerized text analysis software Corpógrafo. Preliminary data showed simple vocabulary and grammatical constructions, in addition to speech acts that often constituted face threatening acts.

Donald Trump's discourse showed high frequency of the first-person singular personal pronoun in comparison to other pronouns, short simple sentences only connected by and and but (no synonyms for these connectors were found), and recurrent adjectives such as great and tremendous. These phenomena can translate in what Holes (2013) calls speech accommodation, which happens when the speaker adjusts his discourse to the speech style of the other participant - which could also be a strategy for the President to get closer to his electorate. Face threatening Acts with little or no mitigation were also found.

This direct, frontal and unmitigated style has contributed to the construction of the authentic ethos of Donald Trump: politically incorrect, with little sensitivity to discursive conventions, and lack of State posture, which the President early on assumed to be his ethos. It is hypothesized that the use of these linguistics features might lie in Donald Trump's marketing campaign.

- 16603 | Optical, Morphological and Electrical Properties of Vapor-Deposited Pentacene Thin Films

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The main purposes of this project are to understand the morphological, optical, and electrical properties for vapor-deposited thin films of pentacene, an organic semiconductor compound with great relevance for science and engineering (Figure 1). A physical vapor deposition procedure was used to prepare pentacene thin films with high purity and homogeneity. This method was explored and optimized by monitoring the temperature of sublimation, vapor pressure, molecular flow rate and deposition time.[1] The morphological properties and a precise determination of the thin film thickness of vapor-deposited thin films were explored with a high-resolution scanning electronic microscope (SEM). The optical properties of pentacene films, including the bang gap energy determination, were studied by UV-Vis spectroscopy. The experimental results allowed to develop a method to predict the thickness of pentacene thin films from their absorbance at the maxima. The electrical characterization of pentacene thin films was made by determining current-voltage characteristic curves (I-V curves) for multilayers of gold(cathode)/pentacene/ITO(anode) with different thicknesses of pentacene film. The experimental results were used to derive the conductance of the system by associating the variation that occurs when the film thickness gets gradually bigger with the voltage that gets applied to the sample and the current that flows in it.

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Acknowledgments

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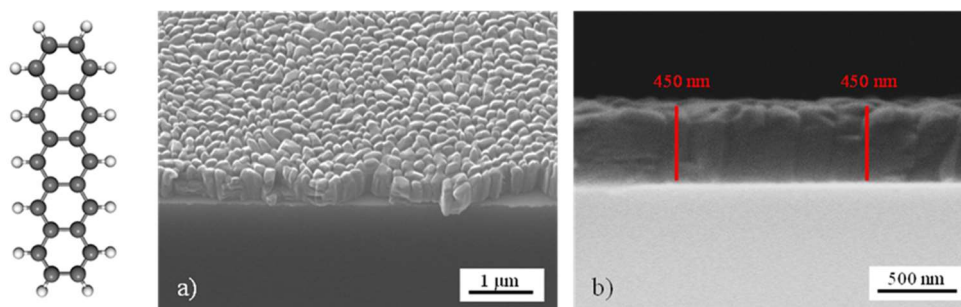


Figure 1. Micrographs of a vapor-deposited thin film of pentacene. Top (a) and cross-sectional views (b) acquired using secondary electron and backscattered electron detectors, respectively.

- 16607 | *Mycobacterium avium* infection leads to bone loss due to an increased osteoclastogenic activity

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The incidence of infections by non-tuberculous mycobacteria such as *Mycobacterium avium* is increasing worldwide. Usually these mycobacteria infect the respiratory tract but are also capable of disseminating systemically and infect other tissues, such as the bone, leading to osteomyelitis. However, how bone infection is established and what are its local pathologic consequences remains unclear.

This work aimed to characterize the effects of *M. avium* infection on bone marrow architecture and consequent dysregulation of bone metabolism. As bone tissue constantly undergoes formation by osteoblasts (OBs) and resorption by osteoclasts (OCs), the function and development of both cell types might be altered during this chronic infection. Hence, we proposed two possibilities: (1) *M. avium* could infect myeloid cells leading to OC formation and consequent increase in their activity; (2) mesenchymal stem cells (MSC), the progenitors of OBs, might be altered during *M. avium* infection.

First, we used an in vivo mouse model to determine whether the infection altered OCs. We found that infection led to a loss of bone marrow parenchymal tissue due to the formation of IFN γ -dependent granulomas. We also noted that cortical and trabecular bone seemed reduced. Furthermore, gene expression studies indicated an increased osteoclast differentiation and function which could underlie a subsequent bone resorption. Afterwards, we assessed whether MSC differentiation into OB was affected by infection. We infected MSC in vitro, and found that these cells were permissive to mycobacteria growth. Further studies are required to determine whether infected MSC have a compromised OB differentiation potential.

With this work, we intend to contribute to the elucidation of the mechanisms responsible for altered bone homeostasis during chronic infection, and to the development of potential therapeutic approaches for bone pathologies resulting from infection or inflammation.

- 16608 | How Computer-Assisted Learning influences medical students' performance in anatomy courses

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Introduction: Anatomy is an essential subject of the medical curriculum. Despite its relevance, the curricular time and logistical resources devoted to teaching anatomy are declining, favoring the introduction of new pedagogical approaches based on computer-assisted learning (CAL). CAL provides an insight into students' learning profiles and features, which are correlated with knowledge acquisition.

Objectives: The aim of this study was to understand how training with CAL platforms can influence medical students' anatomy performance.

Methods: A total of 611 medical students attending Musculoskeletal Anatomy (MA) and Cardiovascular Anatomy (CA) courses were allocated to one of three groups (MA Group, CA Group, MA + CA Group). An association between the performance in these anatomy courses and the number of CAL training sessions was detected.

Results: In both the MA Group ($r = 0.761$, $p < 0.001$) and the MA+CA Group ($r = 0.786$, $p < 0.001$), a large positive correlation was observed between Musculoskeletal Anatomy performance and the number of CAL Training Sessions. Similarly, in the CA Group ($r = 0.670$, $p < 0.001$) and the MA + CA Group ($r = 0.772$, $p < 0.001$), a large positive correlation was observed between Cardiovascular Anatomy performance and the number of CAL Training Sessions. Multiple linear regression models were performed, considering either Musculoskeletal Anatomy or Cardiovascular Anatomy performance as the dependent variable.

Discussion: The results suggest that using CAL platforms to study has a positive dose-dependent effect on anatomy performance. Understanding students' individual features and academic background may contribute to the optimization of the learning process.

Key words: medical education; undergraduate education; learning profiles; anatomy academic performance; computer-assisted learning; computer-assisted training; learning analytics.

- 16610 | “Passion for sale”: Psychosocial determinants of merchandise impulse buying in football fans

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Research on impulse buying has been growing over the last decades, but the literature on the topic still lacks studies that explore in depth the psychosocial factors involved in this behaviour. To address some of these shortcomings, this paper investigates the influence of social comparison and team identification on impulse buying of merchandise. This research also explores the hypothesis of a mediating effect of emotions in this relationship.

Data was collected through an online questionnaire. Answers from 167 Portuguese football fans (103 female and 64 males, Mean age = 24.65 years, SD= 8.69) were analyzed according to a 2 (Social Comparison: downward vs. upward) x 2 (Team Identification: weak vs. strong) experimental design. Social comparison was the manipulated variable.

The results indicated that the tendency to buy merchandise impulsively is higher when the participant is strongly identified with his team, and the upward social comparison further triggered this buying impulse. When team identification is weak, there are no significant differences between upward or downward social comparison situations on impulse buying. It was also found that the greater the team identification, the greater the intensity of negative emotions felt at an upward social comparison, causing a greater impulse buying tendency. On the other hand, when team identification is weak, only a downward social comparison can increase the impulse buying tendency through positive emotions. Finally, some suggestions are made for future studies.

Keywords: impulse buying; social comparison; team identification; emotions; football fans; sports merchandise; experimental method; mediation analysis.

- **16611 | Social and political responses to silting of Cávado river mouth (1750-1870)**
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During Early Modern Age, Cávado river mouth was affected by silting, like others portuguese rivers, causing floods and public health problems, destruction of religious buildings, agricultural fiels sterilization and navigation and anchorage difficulties.

This presentation aims to exhibit empirical answers found by the population, and by administrative institutions for their survival and for removing sand, based on analysis of municipality council records, economic memories, geographical descriptions, the «memórias paroquiais», cartography, correspondence between peripheral institutions and central government and receipts from a local tax, the «real de areia», between 1750 and 1870.

The empirical answers analyzed will be natural fertilization (seaweed, crabs and marl) and adaptation of crop fields («campos de masseira»). On the other hand, the "scientific" and governmental solution analyzed will be the plumbing of Cávado river, but it never materialized. The «real de areia» tax it is a compromise between empirical and scientific solutions adopted by Barcelos and Esposende municipalities in order to solve the problem in the short and long term. Despite these various attempts, the silting of Cávado river mouth has continued and man has been unable to overcome the course of nature.

- **16613 | Towards an useful industrial heritage, a proposal for urban regeneration**
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The Portuguese territory is deeply marked by post-industrial structures in process of ruination. Physical indicators of an industrial past, these architectural structures have heritage value, regarding their antiquity, the quality and exceptionalism of its construction processes and, as we want to highlight, as repositories of collective memories that define and mark the local communities to which they belong.

This paper results from a Masters dissertation which studies the possibilities offered by these elements as enhancers of a new urbanity in the place to which they are inserted. The research is based on a specific case study - A Fábrica de Cima - situated at Castelo da Maia, in the Metropolitan Area of Porto (Portugal), and develops an architectural project for the existing structure. It proposes a new program intended to be useful for the surrounding community, aiming to ally the reactivation of the existing structures and its preservation and valorisation as heritage.

A new method is proposed as an hypothetical intervention strategy towards these industrial buildings, one which considers the surrounding context and the various circumstances which define it, proposing a project in continuity with the metamorphosis of the existing structure. To build such approach, it was made an analysis of similar contemporary cases which offer experimental alternatives to other canonical proposals, these examples are: the case of Fábrica Confiança in Braga; and the various reactivations of Asphalt Green in New York, Factory no 8 in Humpolec and Goldsmiths - CCA in London.

Finally, we design an architectural intervention for the case study, materializing some aspects from the research, the original industrial program is replaced by a new epicentre, facing it as a mean of civic participation, cultural and artistic production and social fomentation, allying the will of local dynamization of Castelo da Maia and valuing the preservation of the existing post-industrial structure.



A Fábrica de Cima (photo: André da Fonseca, 2019)

- 16615 | Study of antioxidant compounds in coffee using a low pressure chromatographic system with amperometric detection

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The use of monolithic columns in FIA based low pressure chromatographic systems has been increasingly explored due to their advantages, such as compatibility with peristaltic pumps and high superficial area (responsible for the high chromatographic efficiency).

In a previous work done by this group of investigation, a low pressure chromatographic system based on ion pair equilibrium, featuring a 1 cm-length C18 monolithic column, and a boron doped diamond (BDD) amperometric detector was implemented for the determination of trigonelline in coffee extracts [1].

In present work, this analytical strategy is currently being exploited focusing the determination of antioxidant compounds in coffee. In these studies, the extracts from two coffee samples, green and roasted Robusta, are being analyzed. The experimental results, referring to the application of different potential values at the BDD working electrode and to the utilization of different mediums (at pH < 1, pH = 4 and pH = 7) for the eluate adjustment prior to the detection, will be presented. Using this simple low-pressure chromatographic system with the experimental conditions so far selected, it was possible to obtain 5 signals in the extract of green Robusta coffee sample's chromatogram, which demonstrates the system's potentiality.

The chemical identification of the compounds associated to each observed signal, using the ESI-MS technique, is currently in hands.

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Acknowledgments

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- **16616 | Formulation of uncoated tablets containing co-processed excipients**

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Vilaranda, André, Faculdade de Farmácia da Universidade do Porto, Portugal

Vale, Andreia, Faculdade de Farmácia da Universidade do Porto, Portugal

Guerra, Sónia, Faculdade de Farmácia da Universidade do Porto, Portugal

Gabrieli, Yohanna, Faculdade de Farmácia da Universidade do Porto, Portugal

Sousa Lobo, José M., Faculdade de Farmácia da Universidade do Porto, Portugal

The aims of this work were: i) to evaluate the flow properties and the moisture content of eight co-processed excipients and of acetylsalicylic acid (ASA); and ii) to study the influence of co-processed excipients on the mechanical strength of tablets and on drug release characteristics. ASA was used as a model of a poorly soluble drug, and high functionality excipients two-in-one (Cellactose® 80, MicroceLac® 100, StarLac® and Prosolv® SMCC HD 90), three-in-one (CombiLac®), four-in-one (Ludiflash® and Pharmaburst® 500) and five-in-one (F-Melt® type C) were studied. Eight tablet formulations were prepared by direct compression using a single-punch compression machine. Afterwards, physical characterization, drug content determination, in vitro dissolution studies and disintegration time tests were performed in the obtained tablets. The main conclusions of this work were: i) all co-processed excipients presented good flow properties and therefore can be used in direct compression; ii) concerning the moisture content, excipients displayed a percentage less than or equal to 4%. Ludiflash® and MicroceLac® 100 showed the lowest moisture content (< 1%). Differently, Prosolv® SMCC HD 90 presented the highest moisture content (4%); iii) the tablet friability was less than or equal to 1% for all co-processed excipients, except for StarLac® which presented a percentage of 1.56; iv) Prosolv® SMCC HD 90, CombiLac®, Pharmaburst® 500 and F-Melt® type C showed the shortest disintegration time (<= 56 s). In contrast, MicroceLac® 100 exhibited the longest disintegration time (220 s); and v) Prosolv® SMCC HD 90, Pharmaburst® 500 and F-Melt® type C displayed the fastest and highest drug dissolution rate. On the other hand, Ludiflash® exhibited the lowest and slowest drug dissolution rate. In sum, the studied co-processed excipients can be used to formulate immediate release and orodispersible tablets by direct compression with desired mechanical strength and drug release characteristics.

- 16617 | Alkyl Chain Length Effect On The Phase Behavior Of Binary Mixtures Of Ionic Liquids

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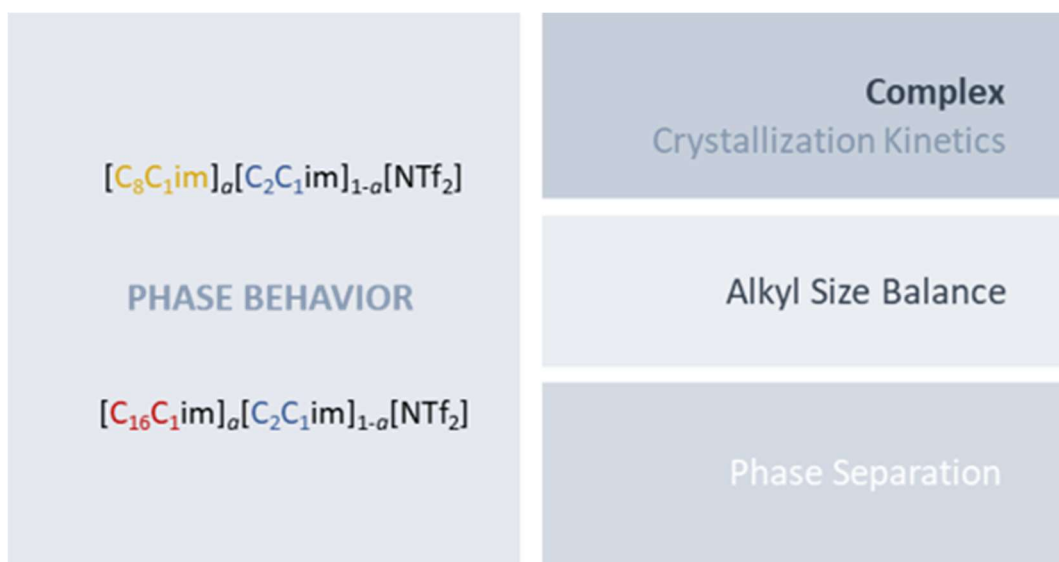
Lobo Ferreira, Ana Isabel M.C., CIQUP, Portugal

Santos, Luís M.N.B.F., CIQUP, Portugal

The aim of this work was to study the properties of some binary mixtures of ionic liquids, in which the anion (bistriflimide) was kept and the chain length of the imidazolium cation was altered. Differential Scanning Calorimetry (DSC) was used to study of the SLE (solid-liquid equilibrium) phase diagrams of the [C8C1im][NTf2] / [C2C1im][NTf2] and [C16C1im][NTf2] / [C2C1im][NTf2] mixtures. For the [C8C1im][NTf2] / [C2C1im][NTf2] system no signs of crystallization were detected, however it was possible to check that the values for the glass transition and the glass transition heat capacity change presented regular behavior. It was also verified, through DSC results, that the mixture [C16C1im][NTf2] / [C2C1im][NTf2] presented a large range of immiscibility that appears to be overlapped with the solid-liquid equilibrium zone. Experimental evidence were found that support the existence of solid-liquid equilibrium in the region of high mole fraction for [C16C1im][NTf2].

The heat capacity ($T = 298.15 \text{ K}$) for each of the 1:1 mixtures was measured using the Drop method in a high precision differential calorimeter. The result for the [C8C1im][NTf2] / [C2C1im][NTf2] mixture reveals regular behavior while the result for the [C16C1im][NTf2] / [C2C1im][NTf2] system reveals irregular behavior, typical of the formation of heterogenous systems with phases in equilibrium.

With this work it was possible to conclude that ionic liquid mixtures present a phase behavior that is highly dependent of the combination of sizes of the alkyl chain. This behavior appears as a consequence of the existence, in each of the mixture's components, of a larger or smaller predominance of polar or non-polar domains that restrain the differentiation of the level of nanostructures and the potential of interaction between the mixture's components.



Ionic Liquid Mixtures

- 16618 | In and out of control: Ballet dancers' self perceptions of emotional intelligence and dispositional flow

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The field of positive psychology emerges as the privileged area for the study of human optimal functioning. In this context, positive variables, such as optimism, satisfaction or well-being, play a significant role in the optimization of diversified dimensions of human realization, from interpersonal relationship quality to optimal performance. However, research on the influence of such variables is scarce among artists.

The present study intended to analyse the dynamics of trait emotional intelligence and dispositional flow in a sample of Portuguese ballet dancers: It was hypothesized that the variables assessed were positively correlated (H1) and that more experienced dancers would present higher levels of trait EI and flow (H2).

The sample included 152 ballet dancers, of which the majority were females (90.7%) and ballet students (87.4%). The dancers answered 4 self-report instruments: The Trait Emotional Intelligence Questionnaire (TEIQue SF); the Dispositional Flow Scale adapted for physical activity (DFS2); a measure for the evaluation of dance practice and a small sociodemographic questionnaire, both designed specifically for this study.

The results confirmed the positive correlation between trait EI and flow ($r = .43$). It was also confirmed that more experienced dancers presented higher levels of emotional intelligence, particularly in the dimension self-control. However, experience in the task wasn't a differential factor for self-perceptions of flow in this sample.

Results also showed that ballet students who attended recreational, free dance courses presented higher levels of well-being, self-control and perceptions of flow than those who attended professionalizing, articulated dance courses.

This study corroborates the previously found associations between positive variables, and reinforces the need for research focused on such variables in specific contexts of realization as privileged processes of human optimal performance.

- 16619 | The abstract form in the expanded field of art: shaping a notion of presence

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This work speculates on aspects that reveal the presence of abstract forms within the notion of expanded art practices. Taking the works of artist Sissel Tolaas (1963) and Ryoji Ikeda (1966) as abstract forms by the means of the aesthetic synaesthetical notion each practices explore, my study intends to reflect on the concept of abstract form beyond the abstractionist phenomenon and beyond pure visuality. I will frame this study ontologically on the notion of temporality by Georges Didi-Huberman (1953), in the concept of formalism proposed by Henri Focillon (1881-1943), and will also consider the greek parameters of the Apollonian and the Dionysian by Friedrich Nietzsche (1844-1900) as well as the concept of Einfühlung by Wilhelm Worringer (1881-1965). My aim is to contribute to the understanding of the potentialities of the abstract form in the expanded field, considering the role of the senses of smell and hearing in the experience of abstraction, and analyzing how, many times emerging from the phenomenical dimension and an apparent rationality - here understood by the greek concept of logos -, *the form rises as abstract and chaotic in its own formal universe.*

Key words: abstract form; aesthetic synaesthetical experience; notion of presence; expanded field of art.

- **16620 | ROBOTIC PROCESS AUTOMATION IN SHRAED SERVICE CENTERS AND ITS IMPLICATIONS FOR THE HUMAN RESOURCES MANAGEMENT: AN EMPIRICAL ILLUSTRATION (IN PORTUGAL)**

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Description of the implementation process of robotic solutions, as an automation tool, in Portuguese Shared Services Centres (SSC) and discuss its impacts, namely in the intervention of companies' Human Resources departments (HRD). The intention is to verify if the introduction of robotics is allowing the "replacement" of workers and, if not, identify the causes for this and the way the Centres are dealing with the potential "excess" of workers and which is the role of HRD. To answer these questions, ten interviews were conducted with General Directors, Project Managers and Human Resources Officers of six companies, whose SSC adopted Robotic Process Automation (RPA) solutions, representing companies on which prior knowledge was available on the fact that they would have embarked on these processes. Five of these companies are listed on the Euronext Lisbon, representing 39% of the weight of the current PSI 20, that is the Portuguese benchmark index. The implementation of robotics was, in all cases, supported by external consultants and always with the objective of training internal resources in order to autonomously guarantee the continuity of the project and future implementations. The impacts experienced focus on the efficiency in the way the tasks are now performed, the effective reduction of hours in the execution of the current activities, the need to adopt new responsibilities within the companies for the RPA solutions' management and development and also the release of workers for tasks with higher added value. The data reveals that the introduction of robotics is helping to "replace" workers from these centres, but in a small dimension, supported by reactive human resources policies (e.g. retirements without replacement, internal mobility and reduction of outsourcing) rather than proactive (e.g. workers redundancies). As far as it is known, this is the first empirical work in Portugal on the adoption of robotics in SSC.

- 16621 | Effects of bariatric surgery and an exercise intervention on physical activity in severe obese patients

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Objectives: The aim of this study was to evaluate, in patients with severe obesity that underwent bariatric surgery (BS) i) the effects of BS on daily physical activity (PA) and anthropometric variables and ii) to evaluate the repercussions of a physical exercise program performed between 1 to 6 months after BS, on the daily PA pattern. Methods: Thirty subjects with ages between 18 and 65 years, body mass index (BMI) $>40 \text{ kg.m}^{-2}$ or $>35 \text{ kg.m}^{-2}$ with obesity-related comorbidities, referenced to perform Roux-en-Y Gastric Bypass (RYGB) or Sleeve Gastrectomy were randomized in two groups: i) one intervention group (n=20) and ii) one control group (n=10). Patients allocated to the control group (CG) received the usual medical follow up following BS with no structured recommendations about exercise. Patients allocated to the exercise group (EG), in addition to the usual medical follow up participated in a supervised multicomponent exercise-training program, for 75 minutes, 3x/week in alternative days, for 5 consecutive months. All patients were assessed at between 1 to 3 months before BS and again 1 and 6 months after BS for determination of the PA pattern and anthropometric variables (body mass, body mass index (BMI), waist and hip circumference). Results: Significant differences were detected in light PA (LPA; $p = 0.038$), moderate to vigorous PA (MVPA; $p = 0.004$) and hip circumference ($p = 0.039$) when patients were compared before and 1 month after BS. The analysis of anthropometric and PA variables of patients divided in CG and EG at 1 and 6 months after BS showed no significant group effect (all $p > 0.05$) for any of the studied PA variables. Conclusion: BS, as expected, resulted in a significant decrease in the mean values of all anthropometric variables assayed, however no clinically relevant effect related to PA was observed. A multicomponent regular exercise program had no effect, showing no efficacy in modifying PA and sedentary time variables.

- **16622 | Injunction procedures: the balance between justice and efficiency**

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This paper will focus on injunction procedures, as established in a European Union level, through the Regulation (Ec) no. 1896/2006 of the European Parliament and of the Council of 12 December 2006 and in a national level, through the "Decreto-Lei nº 269/98", from 1 of September, and guarantee the swift and efficient recovery of outstanding debts over which no legal controversy exists.

With the reform of the Portuguese injunction procedure system operated by "Lei n.º 117/2019", of 13 of September, that "saves" the regime from unconstitutionality, the question that remains to this day is whether or not injunction procedures, guaranteeing efficiency, are sufficiently protective of the defendant's fundamental rights?

There must be a reasonable proportionality balance between the means employed and the aim sought to be achieved when fundamental rights are restrained: the good and fair administration of justice and the limitations aimed at preventing courts from becoming overloaded, guaranteeing the proper functioning of the judicial and, must proportionally prevail facing the right to a defense and to a fair trial.

While injunction procedures, in theory, may fill out each and every one of these criteria, in practice, it is still dubious whether or not a sufficient protection is granted to the defendant, especially considering that the main reason this means is employed is the value of the claim, that, considering the Portuguese economic panorama is considerably disproportionate.

The recent Portuguese regime alteration is of great importance as it takes into consideration these defensibility concerns, even so, it can be argued that this alteration per se, is not sufficient to guarantee a just process, where the defendant has a say in the definition of "what is right and must be executed".

- **16623 | SEX, PLEASURE AND WORK: AN EXPLORATORY RESEARCH ON SEX WORKERS' SEXUAL PLEASURE**

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The sexuality of sex workers is a very underdeveloped topic in research, which may be related to the stigma attached to this population, as well as the low importance given to female sexual pleasure. Like anyone else, these professionals are entitled to their sexuality, pleasure and intimacy and can develop relationships outside the business context.

The purpose of this research is to understand the sexuality of women involved in commercial sex, both in their intimate relationships and in their business relationships. To this end, we seek to understand their attitudes, beliefs and meanings ascribed to both sexual pleasure and intimacy in both contexts.

This investigation adopted the qualitative method. Twenty semi-structured individual interviews were conducted with female sex workers who were currently involved in an intimate relationship and subjected to content analysis.

The analysis of the results shows that sex workers involved in an intimate relationship are able to obtain sexual pleasure with their partners. In addition, these women seek this pleasure and, depending on their level and need for satisfaction, actively do so in both private and commercial contexts.

The conclusions point to the importance of having intimate relationships and to the expression of female sexuality in the lives of sex workers.

We hope that the present study may help to deconstruct some of the stereotypes associated with women engaged in sex work, notably those that associate them with the inability to derive pleasure, as well as to emphasize the importance of sexuality for these women.

Key Words: sex workers, sex work, sexuality, sexual pleasure, intimate relationships, woman.

- **16627 | The role of the media in the feeling of insecurity: a qualitative study**

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Through the use of the qualitative approach, specifically through the application of twenty semi-structured interviews (n=20), this study sought to understand the role of the media in insecurity feelings related to crime, not only from the meanings attributed to the media but also from the experiences situated in the local and social context of each one. It was also our aim to understand if the area of residence (rural and urban), as well as certain sociodemographic characteristics (such as gender), were important in the way meanings are attributed to the media and its relations with insecurity feelings.

One of the conclusions we can highlight is that it is not possible to establish a causal relationship between media consumption and insecurity feelings. Indeed, media do not have a linear influence on the insecurity feelings, as a panoply of meanings has emerged, which makes their impact differential. Thus, aspects such as the sensationalism, the location of the reported crime, the realism of the news and the proximity to the event are examples of factors that emerged with great relevance in this investigation. In other words, the news that the interviewees presented as capable of enhancing their perception of risk, fear of crime and the adoption or reinforcement of safety behaviors are those whose content is contextualized, based on investigations, facts and even motivations, and the episodes occurring near the area of residence - making it possible to know the victim and/or the offender. In addition to these, it was found that both the area of residence and the indirect victimization experiences shape the insecurity experiences and the importance that reported news have for individuals.

In short, this study allowed to reach a depth and diversity of meanings of insecurity feelings, through several approaches that were the basis for their understanding and confirms the relevance of studying this topic from experiences and discourses.

- **16628 | Genomic Characterization of the Prostaglandin E2 Pathway in Gastric Cancer Development**

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Gastric cancer (GC) is the fifth most common cancer worldwide and the third leading cause of cancer-related deaths. GC incidence rate in Portugal, especially in the Northern region, is one of the highest in Europe. PGE2 plays a key role in tumor development and its levels are mainly regulated by COX-2 and MRP4, responsible for PGE2 synthesis and transport out of the cell, respectively, and 15-PGDH and PGT, responsible for its inactivation. Even though there are distinct signatures across ethnic populations, most published studies are focused on Asian populations. Thus, our main objective was to characterize the genomic profile of the genes that encode the proteins mentioned above (PTGS2, ABCC4, HPGD, and SLCO2A1, respectively) associated with GC risk using a tagSNP approach in a Caucasian population from the Northern region of Portugal. Additionally, we further assessed the influence of the most relevant polymorphisms in their expression. In this preliminary study, 51 tagSNPs were genotyped in 222 FFPE samples from patients with histological confirmation of intestinal-type GC and 476 cancer-free controls using the MassARRAY® iPLEX Gold Technology or by Real-Time PCR through allelic discrimination. The mRNA expression was assessed by Real-Time PCR. Eight tagSNPs were identified as susceptibility biomarkers for GC development: rs689466 in PTGS2 gene, rs1678374, rs1678405, and rs1751031 in ABCC4 gene, rs2303522 in HPGD gene, and rs10935090, rs11915399, and rs9821091 in SLCO2A1 gene. Furthermore, rs2303520 and rs11915399 polymorphisms were found to have an influence on the expression of HPGD and SLCO2A1 genes, respectively. The MDR analysis identified an overall three-factor best interactive model composed by age, rs689466, and rs1678374, associated with a 17.6-fold increase in GC risk. In conclusion, our results highlight the importance of the PGE2 pathway in gastric carcinogenesis and its role in the modulation of GC susceptibility in Caucasian populations.

- **16632 | An Inexhaustible Will of Infinite: From pain to creation**

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An Inexhaustible Will of Infinite: From pain to creation is a project focused on body and on will that seeks to examine the possibility of art being simultaneously a pacifier and an intensifier in artistic production.

Through the analysis of case studies and of a reflection arising from artistic practice - built through constructive and, sometimes, destructive processes, associated with a will for involvement between a body and an action -, it is sought to understand how art acts in the appeasement of suffering while contemplating the sentience's enhancement in bodies on the verge of numbness. It is intended to study the convergences related to philosophy and art in a commentary on the presence and action of pain in artistic production and to understand the value added by art to health.

The intention is also to consider how one starts from pain to creation and how, through the Nietzsche's creative will and intoxication, nightmares, daydreams and impulses can generate new artistic forms.

It is envisioned to understand how the artist shapes the ghosts, representing them in a plurality of subjects, where catharsis can guarantee sanity.

The study is based on Arthur Schopenhauer, Friedrich Nietzsche, Gilles Deleuze, and Jean-Luc Nancy, on the artistic production of Louise Bourgeois and Felix Gonzalez-Torres and on a practice-based research.

Keywords: Will - Wellbeing - Body - Artistic creation - Pacification - Intensification – Sentience



As Parcas

- 16633 | Tree-Preference Matters: Participation and Stewardship in Urban Tree-Planting Initiatives. A North Adams Case Study

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The benefits of urban tree planting programs to improve canopy cover and quality of life in lower-income neighborhoods have been well studied. However, the success of these programs often relies on local residents' participation and stewardship of newly planted trees. This project describes an urban tree planting plan in the North Adams that used a landscape preference survey to determine public attitudes toward different tree types and planting configurations. Understanding these attitudes is critical because limited space for street tree plantings necessitated that the majority of trees be planted in private yards.

The study explored local residents' motivations to participate in an urban forestry program and their willingness to have a tree planted in their yards. Participants were asked to rate a series of computer-simulated images that showed different urban tree types that were available at different locations in the same residential setting, a typical urban multi-family home.

A total of 118 residents participated in the study. The results underline a stronger preference for flowering and fruiting trees than for large shade trees despite the fact that the rationale for this initiative is increasing tree canopy to lower energy consumption. Participants indicated that important reasons for their tree choices were aesthetics and environmental concerns. The most preferred landscapes had a mix of different tree types and, in general, had trees with colorful foliage or flowers. Willingness to participate in the program was related to community's awareness of the benefits generated by urban trees, environmental knowledge, and experience in tree care practices. The discussion points to the need to tailor tree planting programs that incorporate local residents' landscape preferences and values as a way to build participation and stewardship for urban trees. Educational efforts about the benefits of urban trees and tree care training also may increase participation.

- **16634 | ObEMMA - Observatory of Electronic Music and Media Arts**

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ObEMMA is a pioneering observatory for monitoring, mapping, diagnosis and promotion of research in the fields of electronic music and media art in Portugal. It is characterized as an exhibition circuit of artistic practices of the creative industry, without neglecting the statistical-descriptive analysis, in relation to the data collected, which aims to be made available on the online platform of the observatory.

The data consists in, approximately, 600 dj's/producers, 200 labels and events promoters, 100 festivals, parties, conferences and other occurrences, 100 locations, moreover academic studies, research, press, platforms, collectives and other structures that contribute to the industry in study. The methodology is based on the individual assemble of artists, their work and the entities associated with them by online platforms and social media, such as Facebook, Soundcloud, Bandcamp, Beatport, etc.

The pilot phase of ObEMMA includes data management exclusively in electronic music, bibliographic research, design of indicators and future planning of the structure to be implemented. This is being carried out in collaboration with CIC.Digital, CITCEM and FLUP with weekly tasks like engaging in research events, looking out for calls, writing articles, organizing our own workshop and helping with the website, being designed by an IT expert.

<http://obemma.pt/>

- 16635 | The Rise of the Machines? Understanding Consumers' Motivations to Use Automated Service Technologies

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Customers increasingly orchestrate their everyday activities with the support of technology (Kunz et al., 2019), leading to new opportunities and corresponding challenges (Kaplan & Haenlein 2020). The service sector is increasingly adopting automated technologies, including service robots, chatbots or virtual assistants (Huang & Rust, 2018). IBM (2017) predicts that by 2020, 85% of customer-firm interactions will be conducted without human intervention.

This study focuses on consumers' motivations to use automated service technologies, namely AI-based Voice Assistants (VA) such as Alexa. Through a cross-sectional study, we empirically validate the conceptual Service Robot Acceptance Model (sRAM) developed by Wirtz et al. (2018). According to the authors, service robots are "system-based autonomous and adaptable interfaces that interact, communicate and deliver service to an organization's customers" (p.909) that can have physical or virtual representations.

Results show that "perceived usefulness", "trust" and "rapport" are the main motivations for VA acceptance in service encounters. We were unable to verify the positive impact of "perceived humanness", which only proved to be significant, yet negative, when considering less experienced customers. No differences were found regarding consumers' proneness to adopt automated technologies.

The contributions of this study are threefold. First, we contribute to bridge a gap in the literature, since research on automated service technologies is still in its infancy and has been largely conceptual. Second, we build on previous research while empirically validating the conceptual sRAM (Wirtz et al., 2018), considering a specific technology (VA). Lastly, we extend the sRAM by incorporating the moderating role of customers' experience and proneness to adopt automated technologies in service encounters. The study also intends to provide managerial guidance on how to successfully implement such technologies.

- 16637 | About Ficar in Progressive Constructions

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The Portuguese language has the verb *ficar*, which is often used in resultative constructions and is characterized by having more than one functionality: staying in a certain place (A Maria *ficou* em casa.), presenting the result of a change (A Maria *ficou* doente.) or may behave like an aspectual operation verb (*ficar a* + infinitive) (A Maria *ficou a estudar*.). In this way, this work aims to study the behaviour of the verb *ficar*, as an indicator of change, in progressive constructions (which, in European Portuguese, are, typically, carried by the construction *estar a* + infinitive) with adjectives (A Maria *está a ficar* mais calma.), in an attempt to characterise not only the verb *ficar* and the progressive constructions but also the adjectives (type of adjective and its possible graduation) that occur in them (Cunha, 1998, 2004; Veloso & Raposo, 2013, a.o).

Thus, for data analysis, we selected examples of two distinct *corpora* (CRPC and CETEMPúblico) built with adjectives, whose tense of "*estar a*" would be in one of following: Presente, Pretérito Perfeito and Imperfeito, Futuro and Condicional (simple times of Indicativo). The selection of examples that were of interest to the study only had two criteria in consideration: 1. the presence of adjectives and 2. the occurrence of the selected tenses for the study.

In this study, it was possible to conclude that the presence of the verb *ficar* in progressive constructions seems to demonstrate the loss of the characteristic completeness and resultative meaning of this verb, presenting the progressive a progression which seems to prevail. Besides, it was also possible to conclude that *ficar* in these constructions, selects mainly qualifying adjectives and that the selected tense is mostly Presente do Indicativo, which occurs in more half of the analyzed examples.

Keywords: *ficar*, progressive constructions, tense, adjective

- **16638 | From humanity and nation to teams and publics. Different collections of humans and the collective nouns in European Portuguese**

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This work presents a reflection upon the class of collective nouns that denote groups of humans in European Portuguese (EP). We will start from a consensual framework such as given by Bosque (1999), Lopes (2005) and Raposo (2013). We will make use of tests proposed by these authors to identify a collective noun in opposition to other non-collective nouns and also to describe the unsystematic behavior within this class. Having established the ontological problem and its grammatical reflection on EP, we will try to show what really distinguishes a collective noun from other nouns that, although meaning a collection of people, don't belong to this grammatical group and, in this sense, we will present a theoretical framework based on Ritchie (2013, 2014, 2017) and Vries (2018). In the following, we will exhibit the results of an empirical analysis in EP. The analysis was performed on a set of 1288 sentences involving the nouns público, equipa, comissão, grupo collected from the corpus CETEMPúblico. The results will show that a collective interpretation is mandatory with collective nouns in SU position but also that differences of interpretation may occur when combining these nouns with different types of states. Two hypotheses will be proposed: a mereological interpretation and a possible scale. Finally, we will also present a special context of the noun grupo that might contradict Raposo's proposal (2013): grupo behaving not exclusively as a dependent collective noun. Our aim is to reflect upon some generalizations about collective nouns, trying to show the diversity and richness of the class. We also aim to show that a collective noun has a structural-functional basis that differs it from other nouns that denote sets or collections of people but do not presuppose this same structure and therefore have a different grammatical behavior. Lastly, we also seek to show how a language can reflect the needs of social creation and the consequences of social construction.

- 16639 | Nostalgia in J. D. Salinger's *The Catcher in the Rye*
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Filled with melancholic shades, the concept of *nostalgia* often refers to a feeling of an idealized longing of the past, something the Portuguese word describes best, the *saudade* of happy moments once lived one vehemently wishes to go back to. This idealized longing describes the position of Holden Caulfield, Salinger's protagonist, towards his childhood, a time he not only wants to recuperate but also has great difficulties in abandoning. Holden goes as further as wishing to preserve it in himself and in anyone whom he still believes can be saved from the corruption of adulthood. Despite *Catcher* being about the emotional downfall Holden experiences, it is not through him, at least not directly, that we as readers learn this. The conclusion comes to us through slight brush strokes of action in the narrative of despair and pression, both from the outside and the inside.

More than physical journeys, the journeys Holden embarks on through time are the one thing that help him cope with the haunts of life. Nostalgia works cathartically for it is through remembering and relieving the past in a nostalgic way that Holden is able to ripen his position in the world which so many troubles it has taken him to find.

This presentation shows how Holden Caulfield's nostalgic speech, his journey to the past, has a cathartic effect in his personality and in his attitude towards the ones who previously, during and afterwards his metaphorical fall were a part of his life. The main elements and agents at the service of storytelling will be analyzed, showing how they are essential to the process of self-illumination that comes across in Holden's final farewell to his rebel teenage years. Because nostalgia is so deeply related to Portuguese culture, a final comparison between the novel and Fernando Pessoa's poem "*A criança que fui chora na estrada*" completes the study of Holden's struggle.

- 16640 | Handball: The tactical perspective of the coaches 14 - 15 years old age group of Porto Handball Association

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José António Silva, Faculdade de Desporto da Universidade do Porto, Portugal

The aim of this study was to analyze the perspective of handball coaches of the Porto Handball Association 14 - 15 years old age group level regarding tactical and technical factors considered important for the realization of an effective game in the attack, defense and transition phases. The sample consisted of ten adult male team coaches of the Porto Handball Association. Information was collected through individual interviews using a question guide. The treatment of the collected information was done through the Collective Subject Discourse method. The results show that regarding: (i) the offensive phase in the individual aspect, decision-making is an essential requirement for effective offensive play; (ii) regarding the group aspect, the execution of decision-making, exchanges, circulation of the ball, movement of the players, blocks, successive penetrations, screens and "go and go" allow an effective offensive game; (iii) the offensive transition phase, coaches are in favor of stimulating rapid defense-attack transition and understand that the effectiveness of training in reduced games is through direct counterattack and counterattack supported. To prevent the opponent's rapid transition to the attacking ground, coaches understand that defensive recovery must be done regularly. In the defensive phase, individual aspect, there is an understanding that defensive posture and travel speed are important for individual defensive effectiveness. In addressing group defensive collective means, the coaches indicated that defensive exchanges, aids and counter-blocks promote effective defense. Summing up the results allowed to identify tactical-technical variables relevant to the coaches for each phase of the game.

- **16642 | Producing film reviews as a means towards learning argumentative writing**

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Conducted during our teaching practice in Portuguese and English, in the light of the principles of Action-Research, this project was aimed at assessing the impact of the production of film reviews on the argumentative writing skills of Secondary Education students. The strategy conceived was targeted at 10th and 11th-graders attending a local private school. To attain our goal, we selected films that invite critical reflection, permeated by relevant topics, which are linked to the Programs of both subjects. Short films were given a place of primacy in our action plan, given their ability to portray compelling narratives in a short amount of time. The discussion of interpretive possibilities arising from the films was combined with the analysis, based on pair work, of models of film reviews. We valued pupils' contact with authentic and semi-authentic materials as they help to reproduce good examples of language and argumentative strategies, enriching their knowledge on the genre: film criticism. The project's theoretical framework focuses on the concepts of argumentation and film reviews, as well as their place in the regulatory documents for teaching Portuguese and English. By evaluating the pupils' texts and their level of engagement, through the application of a questionnaire, we concluded that our strategy was successful. A significant number of students enjoyed the activities and produced well-structured texts, making their overall perspective about the films clear. The arguments and examples to which they resorted were pertinent and imaginative, including lexis and grammar derived from the film reviews they had studied. Indeed, respecting the text genre, using suitable language, choosing relevant information and establishing good coherence connections among their ideas stand out as the areas in which the students obtained the highest scores.

Keywords: written argumentation, film criticism, teaching Portuguese and English.

- **16643 | Updated constraints on rolling tachyon models**

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Rolling tachyon models provide an interesting alternative to Λ CDM, motivated by string theory. Moreover, they also unavoidably lead to a varying fine-structure constant and naturally predict that the magnitude of its variation is determined by the slope of a potential which also impacts the dark energy equation of state. Therefore, astrophysical tests of the stability of the fine-structure constant and cosmological data jointly constrain these scenarios. In this contribution we present the latest constraints on these models, showing that they require values of the dark energy equation of state that are indistinguishable from Λ CDM while still allowing for measurable values of the fine-structure constant.

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- 16650 | Assessment the ecological status of Ribeira de Silveirinhos: physical and chemical parameters and benthic macroinvertebrates

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Lotic ecosystems are characterized by great variability and complexity of biotic and abiotic levels being affected by natural and anthropic factors. Water is a high economic and social value resource, highlighting the need for long-term sustainable system-specific management. In this perspective, in 2000 the Water Framework Directive (WFD) was created with the specific aim of protection and improvement of water quality, regarding the analysis of different elements: general physical and chemical parameters, biological elements, and hydromorphological characterization. Benthic macroinvertebrates are the most widely used organisms for assessing the ecological status of lotic ecosystems, as they are sensitive to different pressures, exhibiting perceptible variable responses in terms of abundance and composition. The main objective of this study was to evaluate the water quality of the Ribeira de Silveirinhos (in Serras do Porto area). For this purpose, physical and chemical parameters were measured, and samples of benthic macroinvertebrates were collected in five sampling sites along the Ribeira de Silveirinhos. Physical and chemical parameters showed high values of phosphates concentrations (reference value for a good ecological status: $\leq 0.10\text{mg/L}$), due to the agricultural activities present in the riverbanks. According to these parameters, the two upstream sampling sites present a good ecological status while the remaining sampling sites are classified as poor ecological status. Regarding the macroinvertebrate community, low values of abundance and richness were recorded, classifying this aquatic ecosystem as poor, according to the WFD. This study was developed in an area with a high ecological peculiarities, being important to promote its maintenance and to complement with studies on soil occupation and its impact on the aquatic system.

Keywords: WFD, water quality monitoring, lotic organisms.

- **16651 | Effect of abiotic stress in Plant Specific Insert (PSI) expression and localization**

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Adverse conditions caused by abiotic stress modulate the plant development and growth by altering some morphological and cellular mechanisms. To face this problem, plants, along with physiological adaptations, developed intracellular mechanisms, including changes in protein production and trafficking or modifications of the endomembrane system. Cardosins are aspartic proteinases isolated from cardoon plants whose expression and trafficking varies with the metabolic activity of the tissues and may also respond to stress situations. The Plant Specific Insert (PSI) is a domain present in some aspartic proteinases that modulates their trafficking to the vacuole in a non-conventional way, bypassing the Golgi. It is known that stress situations can alter protein sorting to the vacuole, changing their routes via a Golgi-independent pathway. Our goal is to evaluate the expression levels of different aspartic proteinases and respective PSIs in plants submitted to different abiotic stresses (osmotic, oxidative, saline and heavy metals) and relate their response to the specific pathway they follow to the vacuole. Preliminary results point to a different response of the three aspartic proteinases under study, AT1G11910, which is upregulated to all the stresses, excluding the heavy metal, AT1G62290, that is downregulated for the oxidative stress, and AT4G04460, is upregulated for the saline stress and downregulated for the zinc stress. Apparently different aspartic proteinase genes respond differently to different types of stress, indicating a fine-tuned regulation.

- **16654 | The effect of urbanisation on mussel population and attributes**

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Over the years, human have profoundly transformed Earth's ecosystems through myriad activities, including modification and degradation of natural habitats disturbing terrestrial habitats, atmosphere and aquatic realms. Urbanisation increases the pressure on ecosystems and their respective services. Nowadays approximately 3 billion people live on the coastline worldwide and thus causes many impacts in marine ecosystems. The mussel *Mytilus galloprovincialis*, Lamarck 1819 inhabits rocky shores in the Mediterranean and extends northward to the coast of France, United Kingdom and Portugal. This mussel is one of the most abundant invertebrates in rocky shores, influencing the biodiversity of intertidal ecosystems. Thus, it plays an important ecological role. Moreover, it is economically relevant, being intensively cultured and/or harvested in many countries as Portugal. Because of the importance of this specie the study of its response of urbanism is increasingly important. The objective of the study is to understand how urbanisation influences the attributes of *M. galloprovincialis* populations. In this study six shores were selected, three in an urban area and other three in a non-urban area. At each shore, were considered two sites and at each one of these sites four samples were collected to evaluate the density, percentage of cover, depth of clumps, size-frequency distribution and condition index of *M. galloprovincialis*. The results demonstrated that mussel density was significantly higher and the size of the mussels was significantly smaller in non-urban shores. The other studied variables did not show any significant differences.

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- 16655 | The influence of training patterns on physical and technical performance of youth male volleyball players

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The purpose of this study was to analyze the influence of training patterns (i.e. number of sports practised, volleyball starting age and years of volleyball practice) on physical and technical performance of youth male volleyball players. Sixty one players were analyzed on the following physical conditioning tests: 5m/20m/30m Velocity, Foot tapping, Agility, Sit-ups, Medicine Ball Throw and Horizontal Jump. The Technical Performance tests included: Reception (reception A, B or outside of the target), Setting (setting to z4), Service (service to z1, z6 and z5) and Spike (spike to z1 and z5). One-Way ANOVA was used to examine the relationship between the variables. Post hoc analyses were conducted using Bonferroni tests. Effect sizes were determined using eta-squared values. The results showed that the volleyball starting age was not a differentiating factor between the players in the variables examined. However, the years of volleyball practice differentiated the players on some physical and technical performance tests, namely the Spike to zone 1 ($p=0,006$) and the Agility test ($p=0,04$). Here, the less the years of practice in volleyball, the better the performance is in the action of Spiking to zone 1. On the contrary, the more experience players achieved a better performance in the agility test. The results also shown that early specialized players in volleyball achieved a better performance in Serving to zone 1 ($p=0,04$), to zone 5 ($p=0,02$) and to zone 6 ($p=0,02$), but no results were found for the other tests. This study suggested that the player's early developmental pathways could influence their physical and technical performance.

Key words: training patterns; physical condition; technical performance; youth sport; volleyball

- 16656 | Asteroseismic grid modeling of the Kepler LEGACY sample: Investigating the helium enrichment law

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The helium abundance is an extremely important element in the construction of models of solar-type stars. However, this element cannot be measured directly from observations due to the low temperatures that do not allow these spectral lines to be detected. A solution to this is to use the helium enrichment law, which relates the initial abundance of the helium with the one of the heavy elements. Considering the results from different observations, the helium enrichment ratio ($\Delta Y / \Delta Z$) is usually accepted to be between 1 and 3. In this study, we used the *Kepler* LEGACY stellar sample in order to explore the systematic uncertainties associated with the stellar parameters (mass, radius, mean density and age) obtained by using two stellar grids constructed with different values of $\Delta Y / \Delta Z$ (1.4 and 2.0). We have found biases in the derived stellar masses and radii that indicate the grid with higher $\Delta Y / \Delta Z$, produces smaller masses and radii. These present systematic uncertainties of 2.6% and 1.1% for mass and radius, respectively. We report a good agreement in terms of the derived mean densities, with statistical uncertainties comparable to systematic uncertainties. In addition, we compared our results with the ESA's PLATO scientific requirements, showing that differences in the treatment of $\Delta Y / \Delta Z$ lead to results in the limits imposed (being these 2-4% for the radius, 10-15% for the mass, and 10% for the age).

- **16659 | Cocrystallization of olanzepine: A way to improve chemical and physical stability**

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An active pharmaceutical ingredient can undergo transformations during processing such as amorphization, polymorphic conversion or hydration. These transformations can result in differences in important properties such as, stability, solubility and bioavailability. It is therefore important to improve API stability during processing. This stabilization can be done through cocrystallization. Olanzapine (OLZ) has the ability to undergo conversion into different polymorphic forms having more than 50 polymorphs known [1]. Therefore, in this work, a cocrystallization screening procedure was performed with five coformers in seven different solvents with the final objective of producing a cocrystal able to improve the stability of OLZ during processing. Cocrystallization was performed through a slurry ultrasound-assisted method [2]. The cocrystallization products were analyzed by mid infrared spectroscopy. Three of the coformers (malic acid, citric acid and nicotinamide) gave indication of cocrystal formation. Nicotinamide was chosen to produce the cocrystal in a higher scale to be further characterized by differential scanning calorimetry and X-ray powder diffraction. Future work will be done in order to evaluate the stability of the cocrystal in different humidity conditions.

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- 16660 | New synthetic anthocyanin-based pigments as pH-sensors for incorporation in food packaging

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Nowadays, there's a major concern about the safety, quality and shelf life of food products. This concern has triggered the curiosity of investigators, namely, in the development of "smart packages", that can inform the consumer, in real time, of the physico-chemical and microbiological state of the product. This information can be obtained through the incorporation of molecules (sensors) which can be activated by an external stimulus such as pH, water or O₂. From these, pH has been the focus of a greater number of studies because its relevance in the determination of the deterioration in many food products.

Generally, a pH-sensor system consists in a pH-sensitive pigment immobilized on a solid matrix. The naturally-occurring or bioinspired pH-sensitive dyes are more desired and suitable for application in food packed products, avoiding the potential harmful brought by the synthetic ones. Bearing this, anthocyanins are water-soluble pigments present in many plants belonging to the flavonoids family, exhibiting a number of color changes according to the pH of the aqueous media. These pigments can undergo in annelation reactions, becoming pyrano-anthocyanins, resulting in a greater color stability and intensity, over a larger pH interval comparing to their precursors.

The focus of this study was the design and the synthesis of bio-inspired pyrano-anthocyanins, that exhibit color changes within the same pH range of the deterioration of some food products (e.g. dairy and meat). As previously mentioned, the synthesized compounds will be then immobilized in thin films for incorporation in food packaging.

- **16661 | THE PROCESS OF SEXUAL GROOMING OF MINORS ON THE INTERNET: DIFERENT PERSPECTIVES**

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Online grooming, is, in general, the process by which an adult utilizes digital tools, such as the Internet, mobile phones, chat rooms or online games, to actively seek out or contact a minor for the purpose of developing a sexually abusive relationship and/or behaviour. This process has been subject to research in recent years, however, both in Portugal and in other countries, investigation on the phenomenon is scarce. The main objective of the present study was to explore and understand, in depth, the perspectives of minors and offenders about the process of sexual solicitation on the Internet, seeking to deepen the contributions of previous studies. To this end, qualitative methodology was used, and in-depth interviews were conducted with six participants, including an offender who was previously convicted for crimes related to sexual grooming online and child pornography and five female participants who had experiences of grooming before reaching adulthood. All interviews were transcribed verbatim and were subject to content / thematic analysis. The results of this study revolved around three major themes: on how participants move about in the online space; on how they perceive and signify the strategies applied in online grooming, namely, the ones involved in the access to, selection of and contact with the victims, among which is child pornography, as highlighted in this study; and the internal processes, specifically a set of perceptions, motivations and justifications which, according to the participants, were involved in the process of grooming. The results demonstrated that, according to the information shared by the participants, all these dimensions are interrelated, are situated in the personal, social and virtual context in which they move, and grant the grooming process its dynamic nature.

Keywords: Sexual grooming; Sex offenders; Internet; Offenders; Minors.

- 16662 | Specified values of addendum thickness in spur gears' teeth: relationship with profile shift x

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Spur gears are widely used and subjected to precise standardization as regards their geometry. A detailed introduction to the field of gear transmissions using spur gears is found e.g. in [1,2].

Profile shift is required for their use in optimal conditions in a variety of situations, including the problem of imposed center distance or the question of durability enhancement through reduction of maximum values of specific sliding (g_{smax}).

In these circumstances, it is necessary to know the limits for profile shift (x) values, related with the required minimum values of addendum thickness (s_a) and gear's number of teeth (z). Clearly, the limit situation where addendum thickness is made zero is generally unsuitable for practical applications, and keeping some minimum thickness related with the modulus (m) of the gear is advisable or required.

For given values of addendum thickness ($s_a = 0.1m$, or $0.2m$, ...), the equations for solving the problem involve an implicit solution depending on x which is not readily obtained. The purpose of the present work is to develop a simple to use tool for the calculation of x values. The solution is presented based on the use of modules of existing mathematical programming software.

The result is a Python application presented on a 3D plot $x=f(z, s_a)$ allowing the user to choose x in order to achieve a desired s_a value.

Given that very low values of s_a weaken the teeth on a local level, such application gives an easy to use tool for the designer to define profile shift x leading to s_a values deemed adequate for maintaining teeth resistance.

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- **16663 | *Marchantia polymorpha* as a model for the study of cellular traffic**

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Marchantia polymorpha is a land plant within the bryophytes, with a very wide distribution and is increasingly being used as a model plant with a large set of molecular tools available for its study and manipulation. The life cycle of *M. polymorpha* is dominated by a haploid phase that is advantageous in terms of genetic and biochemical approaches. We aim to establish in vitro cultures of *M. polymorpha* as a model of intracellular traffic and, more specifically, the study of the PSI (Plant Specific Insert). PSI is a domain of about 100 amino acids found in some aspartic proteases that is involved in host defence and vacuolar targeting and as all saposin-like proteins, functions through interactions with the lipid membranes in vitro. Two different methods for the transformation of *M. polymorpha* were used involving co-culture with *Agrobacterium tumefaciens*. Both gemmae and thalli of *M. polymorpha* were cultured in B5 medium. To evaluate the transformation efficiency two different markers were used: a PSI::mCherry fusion and an endoplasmic reticulum marker - GFP::HDEL. Both methods employed are similar except in one step, which was the use of vacuum to improve the infiltration of *Agrobacterium* in the biological material. We successfully obtained stable in vitro cultures of *M. polymorpha* by cultivating both thalli and gemmae. Furthermore, preliminary results show that *Agrobacterium* vacuum infiltration of *M. polymorpha* seems more efficient than the commonly used methods to obtain transformants. In the end, we expect to validate this model for the study of endomembrane trafficking and particularly PSI-mediated sorting to allow comparison with the most common plant model used - *Arabidopsis thaliana*.

- 16665 | C2 Methylation Effect on the 1-Alkyl-2,3-dimethylimidazolium Trifluoromethanesulfonate Ionic Liquids

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This work presents the study of the methylation effect at the C2 position of the imidazolium ring on the physicochemical properties of the ionic liquids (ILs) 1-ethyl-2,3-dimethylimidazolium trifluoromethanesulfonate and 1-butyl-2,3-dimethylimidazolium trifluoromethanesulfonate.

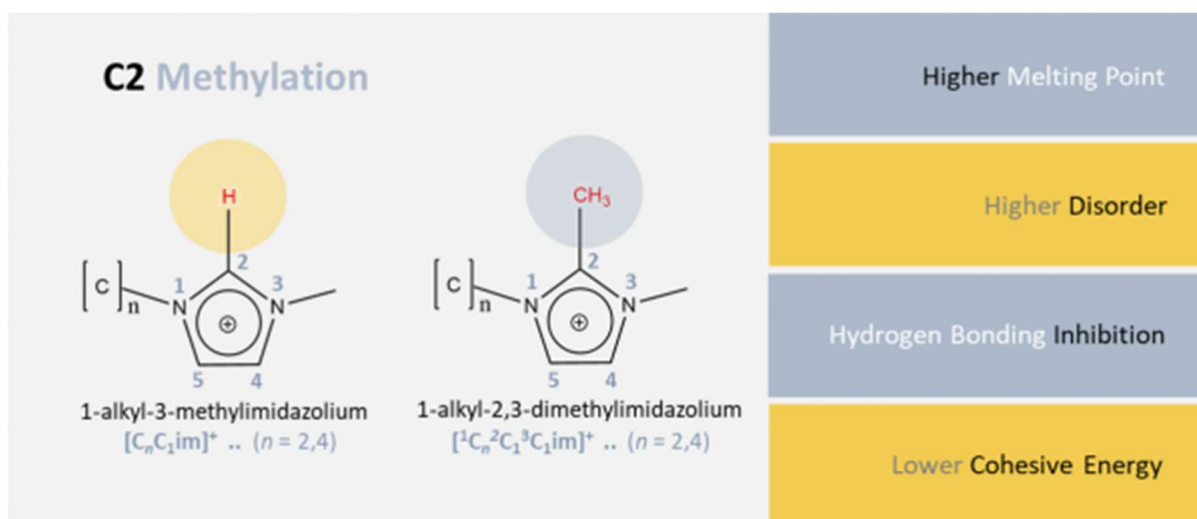
The solid-liquid equilibrium and thermal stability of both ILs was evaluated by differential scanning calorimetry "DSC" and thermogravimetric analysis "TGA" respectively. High precision, isobaric heat capacities at 298.15 K, of these two ionic liquids were measured using a drop calorimeter "Drop-Cp" [1]. The temperature dependence of the vapor pressure was measured by a Knudsen effusion method combined with a quartz crystal microbalance "KEQCM" [2]. The enthalpies and entropies of vaporization were derived from the fitting of the experimental vapor pressure data to the integrated form of the Clausius-Clapeyron equation. The effect of C2 methylation was evaluated and analyzed by comparison with the physicochemical properties of the non-methylated analogues.

The experimental results unraveled the nature of the C2 methylation on the melting and vaporization properties of trifluoromethanesulfonate ILs. Additionally, these results indicate that the interaction between the [OTf]⁻ anion and the acidic hydrogen at C2 position of the cationic ring as a significative impact on the physicochemical properties of this ILs. The melting and vaporization data also suggest that for the ILs with the shorter alkyl chains, the substitution of the C2 hydrogen by the bulkier methyl group lead to an increase of the disorder of the solid phase (higher absolute entropy) which drastically increases the melting temperature.

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C2 methylation on the imidazolium ring of trifluoromethanesulfonate ionic liquids.

- **16670 | The search for an Intent: (re)reading Palazzo Silvestri Rivaldi, in Rome**

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The Palazzo Silvestri Rivaldi, property of the *Istituti di Santa Maria in Aquiro* (ISMA) since 1975, is a Renaissance building complex in Rome composed by two main buildings (a palace and a villa) and other adjoining constructions and gardens. Set in an area of great historical and cultural importance, Palazzo Silvestri Rivaldi creates not only a visual relationship but also establishes an urban connection with the Colosseum and the Roman Forum.

The present paper proposes to reflect on the meaning and significance of Palazzo Silvestri Rivaldi as a potential future cultural complex, associated with the Imperial Forum Archaeological Park, through the understanding of its typology, character and urban significance, in order to (re)assume a prominent place in the city of Rome.

Through successive additions the Palazzo has lost its character and clear relation to the surrounding urban fabric. Additionally, it is evident the lack of use and poor maintenance of both the Palazzo and garden spaces, accentuated by the existing surrounding urban problems, resulting in no public participation or utility. Consequently, Palazzo Silvestri Rivaldi is invisible to the city, requiring a re-reading and intervention criteria that will allow its return to the urban context.

A parallel between alternative architectural, urban and social contexts should be established, considering an in-depth reading of Palazzo Silvestri Rivaldi in order to focus on an appropriate conceptual, formal and programmatic options within the archaeological museum typology set in a heritage context. Hence, the proposed readings attempt to enhance the most interesting points that might prompt new proposals for its conversion, with significant added value in the context of the city of Rome, providing urban and social development.

This study is part of an ongoing master thesis on Master's Degree in Architecture, at FAUP, 2019/20, under the supervision of Helder Casal Ribeiro.

- **16671 | Incremental Housing, Project to the Program of Self-Construction in Santa Maria da Feira**

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Lage, José A., Faculdade de Arquitectura da Universidade do Porto, Portugal

This presentation features the research in-progress on "Incremental Housing, Project to the Program of Self-Construction in Santa Maria da Feira" which has been developed in the context of Master's Degree in Architecture at FAUP, under the supervision of Professor Alberto Lage.

The right to proper housing has been, through the years, a recurring theme of debate at many levels (social, economical, political and architectural). Due to this, multiple solutions and housing care programs have been created and implemented for the most needed populations.

Within the extensive theme of housing, it occurred an opportunity to operate within an existing housing program. This housing care program is the "Program of Self-Construction" in Santa Maria da Feira. It consists in providing support to solve housing shortage for low-income households living in the area, namely residents who have vacant house or land, and want to recover or build their own houses.

The practical side of this work will then be the consequence of a detailed theoretical study and will consist in the creation of a project that best fulfills the premises of this program. Concepts and methodologies concerning social and low-budget housing will be analyzed, starting with strategies of self-construction, incremental housing, and prefabrication with the use of SIP panels. These strategies are assumed to give better responses to the contemporary housing needs, compared to those implemented by most of the current housing policies.

- 16672 | Remote Sensing methodology to assess water quality over Portuguese reservoirs

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Reservoirs are subject to anthropogenic stressors, becoming increasingly degraded. They provide habitats to a large amount of species as well as critical ecosystem services. Therefore, it is necessary to evaluate changes within reservoirs and understand their magnitude and implications towards the ecosystem. In this study we intend to validate the utility of remote sensing techniques to assess the ecological potential of Portuguese reservoirs, established by the Water Framework Directive (WFD). The WFD defines several metrics to assess water quality that require field work followed by laboratory analyses, making the process slow and expensive. Remote sensing techniques can provide a complementary solution that is cost effective and practical, has a broad coverage and that can be frequently executed. The Multispectral Instrument onboard European Space Agency satellite Sentinel-2 has suitable spatial resolution (10, 20 and 60m) to monitor water bodies like reservoirs. The study area is composed of four Portuguese reservoirs: Aguieira (centre), Alqueva (south), Pocinho and Miranda do Douro (north). Sentinel-2 Level 1-C imagery data was selected and later downloaded from EarthExplorer regarding the years 2017 and 2018, for the different study sites. The images were then processed with Atmospheric Correction Processors and later used as input for the "Waterquality" package in R software in order to achieve the water quality of the selected reservoir in a temporal and spatial scale. Finally, the outputs of the "Waterquality" package will be compared with in situ data collected from the four reservoirs through statistical analyses. With the results of this work we intend to validate a coherent Remote Sensing methodology that aids the current methods required by the WFD, but also to analyse spatial and temporal differences between the reservoirs and the years 2017 and 2018.

Keywords: Water quality; WFD; Sentinel-2; Water turbidity; Chlorophyll a; Cyanobacteria

- 16673 | Functional feeds to tackle meagre (*Argyrosomus regius*) stress: physiological responses under chronic and acute stressful conditions

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Castro, Carolina, CIIMAR, Portugal

Coutinho, Filipe, CIIMAR, Portugal

Guerreiro, Inês, CIIMAR, Portugal

Pousão-Ferreira, Pedro, IPMA, Portugal

Matos, Elisabete, Soja de Portugal

Oliva-Teles, Aires, CIIMAR/FCUP, Portugal

Couto, Ana, CIIMAR/FCUP, Portugal

Under intensive rearing conditions fish are often exposed to husbandry-related stressors such as acute water temperature changes, crowding, handling, transportation, or confinement. In fish, stress response is initiated by the endocrine system, which regulates the secondary stress response factors that alter the distribution of resources, such as energy sources and oxygen, to vital areas of the body, and may compromise hydro mineral imbalance and the immune system. These events render fish more susceptible to disease and reduce production yield. To mitigate such effects, fish antioxidant response to stressors can be modulated nutritionally, since nutritional factors were reported to differently affect fish oxidative status.

The need to diversify Mediterranean aquaculture species has recently arisen to face market saturation by gilthead seabream (*Sparus aurata*) and European seabass (*Dicentrarchus labrax*). Meagre (*Argyrosomus regius*) appears as potential candidate to Mediterranean aquaculture diversification, with high growth rates, good processing yield, nutritional value, and market acceptability. Meagre is, however, very sensitive to stress.

Having this in mind, the present work aimed at developing aquafeeds that allow fish to cope with husbandry-related stressful conditions, thus improving fish growth, health and welfare. For that, algae extracts pre-selected in our lab for their antioxidant potential (*Nannochloropsis gaditana* and *Fucus vesiculosus*) were incorporated in balanced dietary formulations for meagre with the major goal of contributing to reduce physiological imbalances resulting from sustained (temperature fluctuation) and acute (grading/manipulation) stressors. To achieve such goals, effects of diets including algae extracts on stress biomarkers and antioxidant enzymes activities were analyzed.

- **16674 | Illegal Fishing in Portugal: Perceptions of law enforcement agents**
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The presentation intends to address the results of a research which is, to the best of our knowledge, the first of its kind in Portugal dealing with environmental crimes from a criminological perspective - Green Criminology. It is the result of a study commissioned by the Portuguese Society of Study of Birds (SPEA) and was also my masters' dissertation. The main purpose was to understand the perceptions of law enforcement agents in relation to illegal fishing in Portugal. This investigation focused particularly on the geographical area of Peniche and the Berlengas islands.

It aimed at understanding the views of law enforcement agents in relation to preventive activities, inspection and repression measures that are used regarding illegal fishing. It also explored existing resources (material and human) for such tasks, as well as the available training for law enforcement agents. It sought to understand the agents' views regarding the dissuasion and operative effectiveness of their activities. It went on to consider their views regarding existing fishing laws and its changes; the interinstitutional connection in the scope of their role; perceived difficulties in fulfilling their tasks and what changes the agents see as necessary to improve their law enforcement activities. For the purpose of this research, a qualitative study was completed which involved semi-structured interviews of 13 law enforcement agents.

The results allowed a description of the law enforcement agents' perceptions regarding the dimensions mentioned before. In the presentation, a special focus will be given of the following dimensions: (i) what interviewees consider to be the most common offenses related with illegal fishing; (ii) their views regarding the effectiveness of the enforcement tasks they do; (iii) perceived difficulties in their everyday operations regarding illegal fishing; (iv) the impact of fishing activities on the environment; and (v) the perceptions about fishermen.

- 16675 | Effects of ecologically relevant concentrations of the contraceptive 17 α -ethinylestradiol to *Daphnia magna*

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The 17 α -ethinylestradiol (EE2) is a synthetic hormone derivated by the natural hormone estradiol and is commonly used for humans medications as well as livestock and aquaculture activity. As a consequence of its high use it has already been detected in different water bodies including surface waters at different concentrations. This compound is resistant to biodegradation representing a potential environmental concern mainly for non-target organisms. *Daphnia magna* is a small and freshwater planktonic microcrustacean filter commonly used in ecotoxicological studies. This study aimed to evaluate the effects of chronic exposure of EE2 in reproductive, behavioral and biochemical parameters of *D. magna*. Five concentrations were tested (0.01, 0.1, 1, 10 e 100 μ g/L EE2) defined based on the levels found in the aquatic environment. A control group (without chemical) was included in the experimental design. Each treatment included 15 individualized replicates. Daily monitoring was performed and mortality, life story parameters (age at first reproduction, offspring and growth rates) and subindividuals parameters (biomarkers of oxidative stress and genotoxicity) were evaluated. Preliminary results revealed significant changes in life history parameters of *D. magna* when exposed to EE2, namely decrease in age at first reproduction and somatic growth rate. According to previous results the contraceptive EE2 represents a potential chemical pollutant, since significant effects were recorded for levels already reported in the wild, namely for environmentally-exposed non-target organisms.

Keywords: Water contamination; Pharmaceutical; *Daphnia*; Life story parameters; Oxidative stress; Genotoxicity.

- **16679 | Modern dwelling in São Paulo: vertical tenements in Higienópolis**

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The housing subject is one of the most important and central accomplishments of the modern movement. In the early 1930s, in São Paulo, the first apartment buildings began to emerge at the Higienópolis neighborhood, which was previously strictly residential and consisting of mansions. Named "vertical tenements" (*cortiços verticais*), the new building typology was strongly opposed by the local population. However, by the early 1970s, the urban fabric was already completely transformed and most of the mansions had been replaced by vertical buildings, mostly residential, and the few remaining mansions occupied by companies or institutions.

Nevertheless, the 1940s and 1950s are defined as a moment of affirmation of the *paulista* modernist movement and the production of collective housing is intense. The Higienópolis neighborhood, with its privileged plots close to the city center and the Paulista Avenue, calls the attention of real estate investors and becomes the stage for Brazilians and foreign architects to produce a remarkable set of modernist collective housing with great architectural interest.

This paper intends to deepen these issues through the analyses of three collective housing buildings in the Higienópolis neighborhood, between the 1940s and 1950s, in order to understand their design options and compositional themes: Prudência Building, by Rino Levi (1944); Louveira Building, by João Batista Vilanova Artigas (1946); and Lausanne Building, by Adolf Franz Heep (1953).

This study is part of an ongoing master thesis on Master's Degree in Architecture, at FAUP, 2019/20, under the supervision of Helder Casal Ribeiro. We intend to contribute to the understanding of the Brazilian and São Paulo's modernist architecture and debate the transformations of the ways of living in order to underline the modern condition and its reflexes in the contemporary architectural scene.

- **16680 | Between times: yesterday's tomorrow is not today**

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This article does not aim to give objective answers, but to create questions.

However, it intends to contribute to a better understanding of the evolution of artistic practices and the notion of artistic medium, highlighting the influence of the social and temporal context in which they are developed. To this end, an analysis of the exhibitions 'This is Tomorrow' and 'Is this Tomorrow?', held in 1956 and 2019 respectively, at the Whitechapel Gallery in London, will be carried out. Through the parallelism between the exhibitions, we do not seek to debate differences between modern and contemporary art, but to reveal and analyse the interest of asking the same question to two generations of artists and architects who have been temporally separated for 60 years and to analyse the different perspectives on ways of thinking, approaching and responding. To do this the criteria chosen were based on the analysis of the curators and participating artists in each exhibition as well as the context in which each one took place.

During the research, approaches to the works of the exhibitions were used as an example. The references on which the work was based were the catalogues of each individual exhibition as well as the Whitechapel Gallery website and an article in The Guardian newspaper. In relation to final considerations, such as the exhibition, Is this Tomorrow of 2019, there are no objective conclusions, but there is, on the contrary, indeterminacy, questions that "give anyone something to think about" remain open. Since current events are the "tomorrow" of the proposal made in 1956, how is it possible to provide a reflection in relation to what was expected? And with what perspective does Contemporary Art face the future, today? Student ID:

Key words:

Tomorrow, future, media, contemporary art, artistic practice.

- **16681 | Exploring Leaders and Followers' Perspectives on The Role of Technology in Leadership**

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Technological growth and the inherent widespread use of internet-mediated technologies has been a constant throughout the years. Thus, in organizational settings, work changed in accordance, evolving to virtual forms. Furthermore, leadership remains central in these settings and even more when presential coexistence is not a constant. The e-leader virtually links the workers and the organization, nurturing a social influence process that guides them, constructively, through development opportunities and to common goals (e-leadership).

This study focuses CEiiAs' leaders and followers' perspectives on e-leadership and its dynamics. Through qualitative interviews with five e-leaders and two e-followers, we unveiled perceived advantages and disadvantages of e-leadership (context-specific, that impact on communication, coordination, planning and formalization), self-perceived roles regarding the process (as caregivers, communicators, conciliators, honest and direct, present, instigators and / or solvers), insights on the aspects associated with its operationalization (internet connection, nationality and culture, time zone, language, experience and relational aspects) and perceived e-leaders' characteristics linked to positive results (instrumental competencies, social skills and specific strategies). Moreover, it was possible to set a clear image of this ever-growing phenomenon and set ground for overall improvement of e-leadership practices. Finally, research gaps were identified for future investments.

Key words: Technology, E-leadership, Virtual teams.

- **16682 | Within a topographical Portico: (re)reading the Woodland Crematorium**

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The Woodland Crematorium, represents the last great work of the architect Gunnar Asplund, and plays an exemplary role in his professional path. Located in the Woodland Cemetery, in Stockholm, designed with Sigurd Lewerentz, in 1915, this building establishes a particular dialogue with the landscape, creating an atmosphere of peace and serenity, that tries to respond to the pain and feelings of personal loss.

The ensemble, formed by three chapels and a crematorium, is preceded by a continuous portico. This portico is the main element articulating volumetrically the whole ensemble, composing the first impact on the cemetery's main entrance. Through several architectural themes, symbolic notions, and an atmosphere intent, Asplund drafts the main portico as a temple, ascended by a long promenade, permeable and in constant dialogue with the surrounding nature.

This paper intends to understand and synthesize this enigmatic work, within Asplund's oeuvre, through the notion of an exceptional architectural element: the topographical portico. This monumental shelter welcomes, before and after the funeral ceremony, constituting an important transitional space between interior and exterior but, above all, of permanence and enriched discourse with the whole landscape.

This study is part of an ongoing master thesis on Master's Degree in Architecture, at FAUP, 2019/20, under the supervision of Helder Casal Ribeiro. It is our objective to emphasise the importance of this project in understanding modern architecture's contribution to contemporary discourses and narratives.

- **16686 | Lipid nanoparticles as carriers of anthocyanins derivatives for topical application**

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Anthocyanins are present in many foods and beverages being responsible for plants coloration, cellular growth and regulation of fruits maturation. Over the years, several in vitro studies have demonstrated their overall beneficial health effects including antioxidants and antimutagenic properties. Moreover, anthocyanins also display vibrant colours which makes them targets of interest for cosmetic and food Industries. However, in aqueous solutions these molecules are very instable, and their colour is depending of the pH of the medium which difficult their application. Thus, anthocyanins derivatives, that present a higher chromatic stability, represent a promising alternative concerning their use in topical formulations such as hydrogels and creams [1]. With this in mind, the main goal of this work is to use lipid nanoparticles to enhance the bioavailability of anthocyanins derivatives [2, 3]. For that, different lipids and surfactants were used and the size, polydispersity, zeta potential and encapsulation efficiency of the compounds were evaluated over time.

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- 16690 | Identification of New Drugs Against Biofilm Formation and Development in *P.aeruginosa*: a Computational Approach

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Biofilms are highly organized communities of bacteria attached and enclosed in a self-produced matrix. These structures show differences in gene expression when compared with similar free-flowing cells. Furthermore, they are highly resistant to antibiotics and host immune response and affect both human tissues and medical devices.¹ One of the main mechanisms of biofilm formation is Quorum-Sensing (QS), the intercellular communication in bacteria. This mechanism results in alterations in gene expression in a population density dependant manner.² *P.aeruginosa* is a highly pathogenic gram negative bacteria capable of forming biofilms through QS. The development of potent inhibitors against these QS mechanisms is a promising therapeutic strategy to combat *P.a* related infections.³

Molecular Docking⁴ is a computational method used to accurately predict the preferred binding pose between two molecules. Virtual Screening⁵ (VS) is the application of docking to large databases of compounds. The development and optimization of specific VS protocols capable of identifying compounds with inhibition potential against LasR is a possible strategy to reduce biofilm formation in *P.aeruginosa*.

This work reports on the identification of compounds for the inhibition of quorum-sensing in *P.aeruginosa*. Several molecular docking software were used in the screening of large databases of natural, marine and FDA approved compounds with unknown activity against LasR. The best performing compounds can now be tested experimentally for their action against LasR.

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- **16691 | The impacts of PNBE for reading diffusion**

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This paper aims to demonstrate the results of a diagnostic evaluation on the functioning of the National School Library Program (PNBE), an existing program in Brazil created by the State of São Paulo government. The program aims to promote and encourage reading in students and teachers by distributing literary, research and reference books in the public-school network throughout the State. The methodology used to obtain the results was to follow the entire book distribution process in a school of São Paulo from 2015 to 2016 to understand which genres students prefer, which are the most widely read and why students choose any particular genre over others. The first task made has been account for the organization of book collections as soon as they arrived at the school.

In addition to considering the inventory made by the library manager and controlling the amount of books delivered, the research team used, as primary data source, the controlling forms that contained the entry and exit registry of the titles borrowed by the students during the time-period considered for the research. These data were analysed as a way to deduce the student's preferences by grouping and classifying the chosen titles.

It was observed that the titles destined to high school levels were delivered in 2015, and only in 2016 the distribution process focused on elementary and youth education levels.

It is also reasonable to infer that as students grow older, their interests evolve from simpler text formats to a broader and more complex range of text types. This evolution indicates that the deeper their linguistic competences are, the wider their interests. The immediate consequence is that the PNBE has an strategic function on long-term educational policies - there must be consistent public investment in the program through time, given that students tend to be demanding for different types of texts as they age, and the public schooling structure must be prepared to cope with these needs.

- **16692 | The feminist critique and a new way of thinking about the museum**

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From the second half of the twentieth century, supported by the need to think of museums as democratic places and more open to its community, a new relationship between museum and public has been established. These new ways of thinking about the museum, have spurred the rise of critical currents concerned with new ways of adapting long-standing museums practices to change political, social and cultural circumstances. Among these currents, I am interested in understanding the role of feminist critique of institutions, and how it has driven the emergence of museums and spaces dedicated to women artists. According to the thesis "Feminist Curatorial Interventions in Museums and Organizational Change: Transforming the Museum from a Feminist Perspective", Laura Diaz Ramos argues that there is a contradiction between feminist and institutional values. It is understood that despite its historical vocation of giving artworks a public existence, the museum is an institution traversed by diverse political and ideological interests. Unable to change established institutions, feminist strategies are more efficiently incorporated in alternative spaces, located at the margins. However, this position is disputed by professionals of the field, who believe that this distance further reinforces the idea of exclusion. To understand these contradictions, the challenges and difficulties encountered by these institutions, i used as a case study the Frauenmuseum, founded in 1981 by artist Marianne Pitzen and a group of interdisciplinary women who worked in the city of Bonn.

Ramos, L.D. (2016). Feminist Curatorial Interventions in Museums and Organizational Change: Transforming the Museum from a Feminist Perspective. Thesis submitted for the degree of Doctor of Philosophy. University of Leicester, Leicester. 217pp.

Keywords: Museum, Woman's Museum, Feminist Critique, Alternative Spaces

- **16694 | Multicopy versus unicopy genes as potential molecular markers for the detection of sesame as an allergenic food**

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Food-induced allergies affect a significant part of the world's population, being faced as an emergent problem of public health. Sesame is an important allergenic food with an overall allergy prevalence of 3.7% among the European population. Like other seeds, sesame allergy is generally life persisting, being the cause of severe and systemic adverse immune responses in sesame-sensitized/allergic individuals. Due to its wide presence in processed foods, such as bakery products (often as hidden allergens), the development of analytical methods to detect traces of sesame in foods is of utmost importance.

This work intends to develop DNA-based methods for the detection/quantification of sesame in foods: qualitative PCR and real-time PCR. Multicopy (Cytochrome c oxidase (COX) 6b-1 and peroxiredoxin genes) and nuclear genes (encoding Ses i 2 and Ses i 7 allergens) were targeted as potential molecular markers for the specific identification of sesame using *in silico* tools, which allowed designing 7 primer pairs. To confirm specificity, all primers were experimentally tested using a collection of n=72 species of animals and plants, including peanut and mustard because of being potentially cross-reactive species with sesame. For method development, model foods containing sesame, such as breads or crackers, were prepared in a concentration range of 10-0.0001% (w/w).

Preliminary results revealed that one pair (Ctc-F2/Ctc-R2), targeting the gene COX 6b-1, presented no cross-reactivity with the tested species, being selected as the molecular marker for sesame identification. By qualitative PCR, an absolute sensitivity of 1 pg of sesame DNA was achieved for the selected primers. Currently, a real-time PCR method is being developed aiming at quantifying sesame at trace levels in processed foods.

Acknowledgments: This work was supported by FCT through project AlleRiskAssess - PTDC/BAA-AGR/31720/2017. C. Villa is grateful to FCT grant (PD/BD/114576/2016).

- 16695 | In vivo, in vitro and in silico studies of new antifouling compounds obtained by synthesis

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Biofouling is defined as the undesirable colonization of submerged surfaces by fouling organisms and represents a major economic nuisance for the maritime industries worldwide.[1]The most used strategy to combat this problem is the use of antifouling paints,however these paints are toxic to marine organisms and to environment[1].Thus,the development of greener antifouling agents for practical use has been a priority[2].In this work,46 nature-inspired compounds synthesized in the Laboratory of Organic and Pharmaceutical Chemistry were tested as potential ecofriendly antifouling compounds.All compounds were screened using *anin vivo* anti-settlement bioassay with mussel *Mytilus galloprovincialis* larvae. 13 compounds were active against settlement of mussel larvae($EC_{50} < 25 \mu g \text{ mL}^{-1}$).In order to assess the possible mechanism of action of these 13 compounds,the inhibition of the enzyme acetylcholinesterase as evaluated and only 1 compound reached 35% of inhibition at $100 \mu M$.The ability to inhibit the growth of biofilm forming bacteria was evaluated for 2 compounds and both compounds were able to inhibit(28-52%)the growth at $15 \mu M$.The ecotoxicity test on a non-target species,*Artemia salina*,was evaluated for 11 compounds and results showed that 8 compounds are non-toxic to this species($50 \mu M$).*In silico* calculation of LogKow values showed that 8 compounds have low potential for bioaccumulation($\text{LogKow} < 3$). With this study,1 chalcone,1 flavone,2 phenolic derivatives and 2 acetophenones were selected as the most promising.[1]Amara,I.et al,Environmental toxicology and pharmacology 2018,57,115-130.[2]Almeida,J.R et al,The science of the total environment 2018,643,98-106.Acknowledgments:Work provided by StrategicFundingUID/Multi/04423/2019 and projects:PTDC/AAGTEC/0739/2014(POCI-01-0145-FEDER-016793;project9471-RIDTI);POCI-01-0145-FEDER-028736,co-financed by COMPETE2020,PT2020 and EU over ERDF and by FCT over national funds.SFRH/BD/114856/2016.SFRH/BD/147207/2019.

- 16696 | Effect of thermal processing and food matrix in the immunoreactivity of soybean and lupine proteins

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Legumes of the Fabaceae family are considered good sources of proteins and essential elements, like vitamins and lipids, being worldwide consumed. However, they also play an important role in the scenario of food allergy. Soybean and lupine are such cases, whose allergies are increasing in overall prevalence at global scale. From the industry point of view, soybean and lupine protein isolates and concentrates have high technological interest, due to their emulsifier properties, gelling capability, texture improvement and water binding. Therefore, those technological products are often added to processed foods, such as meat and bakery products, posing a concrete health risk for the soybean or lupine-allergic individuals. This work aimed at studying the combined effects of thermal processing and food matrix on the immunoreactivity of soybean and lupine proteins used as ingredients in meat and bakery products, respectively.

The effects of baking, mild oven cooking and autoclaving on the protein profiles and immunoreactivity were evaluated, using model foods mimicking the production of soybean-containing cooked-hams/sausages and lupine-containing breads, by NATIVE- and SDS-PAGE, and immunoblotting. In meat mixtures, the results revealed considerable protein fragmentation in autoclaved sausages, with decreased immunoreactivity of soybean trypsin inhibitor (as protein marker). Likewise, the lupine gamma-conglutin immunoreactivity was slightly reduced in wheat flour mixtures compared to rice, but it was more marked in baked lupine/wheat breads. The analysis of 22 commercial foods allowed identifying lupine gamma-conglutin in 4 products (breads, toasts and flour) and soybean trypsin-inhibitor in 5 sausages, enabling further discrimination of autoclaved samples from other mildly heat treated foods.

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- 16697 | Serine-based surfactants as potential drug delivery and antimicrobial agents

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Due to the rapid emergence of resistant bacteria, the development of new antimicrobial agents is of the utmost importance in biomedical chemistry. [1] Quaternary ammonium surfactants have shown to present interesting antimicrobial properties, yet their applicability is rather limited due to their high cytotoxicity. [2]

A possible solution to this issue is the combination of classical antibiotics, with already tested therapeutic and economic benefits, with novel delivery systems based on cationic surfactants, attempting both, to bypass the mechanisms of antibiotic resistance, and to increase the clinical effect.

In this context, our research group has been devoted to the synthesis and physicochemical evaluation of several serine-based cationic surfactants. [3-5] Herein, we present the results obtained in the evaluation of the biophysical interactions of some of these surfactants with model lipid membranes with different surface charges. The *in vitro* antibacterial activity of the liposome-forming surfactants was also evaluated, aiming at the establishment of a novel strategy to fight infection: encapsulation of antibiotics in liposomes that show antimicrobial activity *per se*.

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- **16698 | Addressing landscape connectivity in biodiversity conservation strategies in the African Sahel**

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Habitat connectivity is key to ensure species persistence in changing arid freshwater ecosystems. Systematic conservation planning finds relevant areas to ensure species dispersal and mitigate the negative effects isolation. This study simulates the effects of allocating isolated management units in the hydrologic network using longitudinal connectivity to find a minimum set of connected priority freshwater sites to represent all species. Twenty-six water-dependent taxa from 59 mountain rock pools (Gueltas) of three Mauritanian mountains are used as case-study. Eight scenarios were tested in Marxan to find priority conservation areas integrating water residency time and different connectivity rules between Gueltas and upstream areas. A new framework is presented that considers isolated management units in its hydrological context and helps to minimise the downstream propagation of threats into local biodiversity hotspots. Seven Gueltas were always selected and are essential to achieve representativeness in the solution. Incorporating water residency time in connectivity resulted in solutions with higher water availability throughout the year, which is crucial to ensure water-dependent species dispersal in arid regions. Incorporating connections between upstream areas optimises the representation of corridors and selects Gueltas in areas with lower human footprint. Therefore, considering different types of connectivity affects the selection and number of priority Gueltas and the habitat suitability of upstream areas. The results obtained from spatial prioritisation tests revealed important locations for local biodiversity by combining terrestrial and freshwater conservation and allows inter-mountain species dispersal. Moreover, promotes species persistence by preventing the propagation of threats into Gueltas. The framework developed allows addressing connectivity in conservation planning that is scalable to regions with similar wet-dry climatic conditions.

- 16699 | Biodegradation of two widely used fluorinated pesticides, beta-cyfluthrin and cyhalofop-butyl

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The insecticide Beta-cyfluthrin and the herbicide Cyhalofop-butyl are two fluorinated pesticides highly used worldwide. Due to their widespread use, trace concentrations of these compounds have been detected in several environmental compartments, potentially bringing negative consequences to diverse ecosystems and organisms, including humans (Cycon & Piotrowska-Seget, 2016; Zhou et al., 2018). This work aimed to investigate the potential of bacteria originated from sediments of an estuarine area subjected to anthropogenic contamination, to biodegrade these pesticides. Fluoride release was used as an indicator of biodegradation since it often constitutes a critical step in the biodegradation of fluorinated molecules (Murphy et al., 2009). An enrichment process was carried out along 8 months, during which 5 mg L⁻¹ of pesticide were supplemented individually to the microbial cultures (obtained by mixing sediment with mineral medium) in 21-day periods. Sodium acetate (400 mg L⁻¹) was also supplemented as a co-substrate in intervals of 3 days. Fluoride release and bacterial growth were monitored at the beginning and at the end of each 21-day period. Results so far obtained showed an increase of the biodegradation performance along the enrichment process by the enriched microbial cultures, with defluorination of Beta-cyfluthrin and Cyhalofop-butyl reaching 71% and 100%, respectively, at the end of the enrichment process. In the future, we intend to test the biodegradation of both pesticides as sole carbon source, study their biodegradation kinetics, and characterise the involved microorganisms using both culture-dependent and independent methodologies.

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- **16700 | Doxorubicin and mitoxantrone cause dissimilar effects in the brain of different age mice: an in vivo chemobrain study**

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Chemotherapy-induced cognitive impairment, also referred as 'chemobrain', has been observed in cancer patients. Doxorubicin (DOX) and mitoxantrone (MTX) are two chemotherapeutic agents that may cause 'chemobrain'. Our work aimed to evaluate the effects of clinically relevant doses of DOX or MTX on the brain of male CD-1 mice at 3 different ageing stages [juvenile (4 weeks), adult (3 months) and old (18-20 months)]. Mice received a total cumulative dose of 6 mg/kg MTX or a total cumulative dose of 18 mg/kg DOX, except the oldest group that received a total cumulative dose of 9 mg/kg DOX. Mice were euthanized 1 week (adults and old) or 17 days (juvenile) after the last injection. To evaluate the brain's redox status, total glutathione (tGSH), reduced glutathione (GSH) and oxidized glutathione (GSSG) levels were determined, as well as, the GSH/GSSG ratio. To evaluate the brain's energetic status, ATP was measured. In the left-brain hemisphere of adult mice, the expression of protein biomarkers of putative damage in the hippocampal formation was evaluated, using immunofluorescence microscopy. Brain levels of GSht, GSH and GSH/GSSG ratio were significantly decreased in DOX adults. MTX did not cause significant changes in the brain glutathione levels. The juvenile mice treated with DOX revealed higher ATP levels, while no changes in ATP levels were seen in adult or old mice treated with DOX or in any of the MTX-treated animals. Our data suggests that DOX and MTX cause dissimilar effects in the brain of different aged mice that need further research.

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- 16701 | Social Information Processing and aggressive behavior in children – core findings and exploratory adaptation of the Social Information Processing Interview Preschool [SIPI-P].

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Previous research suggested that poor/biased Social Information Processing [SIP] and aggressive behavior are associated. Children with aggressive behaviors tend to encode more hostile cues, interpret ambiguous situations as hostile and access and choose more aggressive responses, once they see them as positive. The current study aimed to explore the relation between SIP and reactive and proactive aggressive behavior in children aged 7 -10. To reach this goal, the Social Information Processing Interview - Preschool [SIPI-P], a scenario-based instrument of evaluation of SIP, was translated and adapted to the Portuguese language and culture. To measure proactive and reactive aggressive behavior, parent's and teacher's ratings were used. The study sample consisted of 99 children recruited from 4 urban elementary schools. The psychometric properties of the instrument were examined and the associations between children's SIP patterns and parents and teachers reports of children aggressive behavior were analyzed. Results show that the SIPI-P has a poor internal consistency and a good inter-rater reliability. A positive association between reactive and proactive aggressive behavior was found. The results did not reveal the existence of an association between biased SIP and reactive and proactive aggressive behavior, as hypothesized. However, in the scenario-based instrument, children that attributed a hostile intention to peer conduct constructed more aggressive responses than children that did not. Children perception about other's actions are important to explain aggressive behavior, more specifically, when children perceive peer's conduct as hostile they tend to formulate responses in an aggressive way. Given the importance of this knowledge for prevention and intervention purposes, more studies are needed to validate the current findings and to further develop measures of SIP for Portuguese context. Keywords: Social Information Processing; Aggressive behavior; Children

- **16702 | Watching the universe expand in real time**

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The redshift drift of objects following the Hubble flow provides us with a unique (but still unfulfilled) opportunity to watch the universe expand in real time, and in a model-independent way. The first practical proposal for this measurement emerged in the context of the ELT (the so-called Sandage-Loeb test), but in recent years redshift drift measurements with other facilities have also been proposed. In this contribution we provide a comparative analysis of the constraining power of these measurements for various cosmological scenarios. Our analysis includes the latest techniques and facilities proposed in the Astro 2020 white papers call.

- **16706 | Hydroxytyrosol bis-esters antioxidant activity in a liposomal system**

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The knowledge of the interaction of antioxidants (AO) with lipid membranes is crucial to understand the distribution of these molecules in the body, and to establish relationships between the physico - chemical properties and their biological effects. Hydroxytyrosol (HT), a strong radical scavenging molecule, has a hydrophilic nature and therefore has very low diffusion into biomembranes. Therefore, it was our aim to increase the hydrophobicity of HT by synthesizing HT bis-esters with different alkyl chain sizes (C12, C16 and C22).

The antioxidant activity of hydroxytyrosol bi-esters (phenolipids), with the same reactive groups but of different hydrophobicity, towards oxidation initiated by 2,2'-azobis(2-amidinopropane) hydrochloride in a soybean phospholipid liposome system was studied. The stability of liposomes increased when compounds were added to the liposome suspension, 0.2 - 1 fold. However, the antioxidant activity of these phenolipids decreased progressively with increasing chain length. When the compounds were incorporated into the liposome during their preparation, the stability of liposomes increased even more (from 1.9 to 2.1 fold) and the compound with the best antioxidant activity was the C22 derivative. Differences between results may reflect the better location of compounds into the liposome structure when added during their preparation. These results strongly support the idea that the efficiency of an AO correlates with its location in the membrane.

Acknowledgements

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- **16708 | Tracking Nitric Oxide Production caused by Melanoma-Macrophages Interaction**

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Melanoma is a type of cancer that has great ability to form metastases in various sites of the body, including the central nervous system (CNS). Nitric oxide (NO) plays a dual role within the tumor microenvironment. While low concentrations of NO can play pro-tumor functions, promoting tumor growth and invasion, high concentrations of NO are involved in tumor cell death. Cells of the immune system, namely peripheral macrophages and microglia, the resident macrophages of CNS, are able to produce high concentrations of NO, playing a critical role in the control of tumor progression. However, tumor cells have been shown to produce immunosuppressive mediators that will shift macrophages phenotypes from pro-inflammatory M1 into anti-inflammatory M2. Whether this human melanoma-macrophages interplay impacts on NO production by macrophages/microglia is still unknown.

Therefore, we studied the effect of the human A375 melanoma cells secretome on the production of NO by peripheral macrophages (THP-1 differentiated cells) and microglia.

Incubation of THP-1 macrophages or microglia with lipopolysaccharide (LPS; 100-1000 ng/mL) increased NO production without affecting cell viability. Immunocytochemical results have shown an increase in iNOS expression by THP-1 macrophages and microglia, when stimulated with LPS, confirming that these cells express the machinery required to increase NO production.

Six and 24 h secretomes did not change THP-1 macrophages viability. Additionally, 6 h secretome decreased LPS-induced NO production from $157 \pm 20\%$ to $115 \pm 10\%$ ($n=4$, $p<0.05$) in THP-1 macrophages and from $137 \pm 12\%$ to $100 \pm 5\%$ ($n=4$, $P<0.05$) in microglia, while 24 h secretome decreased LPS-induced NO production significantly only in microglia, from $133 \pm 15\%$ to $96 \pm 9\%$ ($n=4$, $p<0.05$).

This study demonstrates that the human A375 melanoma cells produce immunosuppressive factors leading to an inhibition of NO production by peripheral macrophages and microglia that favors tumor growth and escape.

- 16710 | Patterns related to wolf predation on free-ranging horses: implications for damage prevention

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In northern Iberian Peninsula, free-ranging horses are relevant prey for wolves, representing an ecological context poorly studied worldwide. Particularly, in northwestern Portugal and Galiza, an autochthonous breed of mountain ponies, the Garrano, raised under a free-ranging regime, provides a stable food resource for wolves that generates socioeconomic conflicts. In Portugal, wolf damages are compensated in order to mitigate losses of livestock owners. However, the compensation system is inefficient and the legally required measures to prevent wolf attacks are difficult to implement for free-ranging horses. Thus, research in wolf-horse interactions can promote new solutions to minimize wolf predation and adequately compensate owners.

The aim of this study is to investigate patterns related to wolf predation on free-ranging horses in Serra d'Arga (Viana do Castelo). We assessed the prevalence of horses in wolf diet and prey selection, estimated wolf predation rates on horses based on GPS telemetry of a collared wolf and identified individual horses in wolf diet remains using innovative procedures based on non-invasive genetics to enlighten further wolf-horse interactions.

Results showed that free-ranging horses comprise the majority of wolf diet (>85% of consumed biomass) and are under strong positive selection by wolves. Predation impact was approximately 40% of the annual horse population, with estimated kill rates of 5.8 horses/month, reaching values of 0.5 horses/wolf/month considering the estimated size of the local pack (n=12). Genetic individual identification of horse remains found in wolf scats and predation sites is introduced in this work for the first time as an innovative approach that allowed to identify 46 different horses consumed by wolves. Overall, predation seems biased towards males considering their availability in the area. We discuss measures to mitigate wolf predation on horses related to herd management and alternative compensation systems.

- 16711 | Remarks on specific sliding and Hertzian contact on spur gears

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The design of spur gears involves, among many others, the problems of (i) equalizing maximum specific sliding values $g_{s,max}$ using profile shift x , and (ii) evaluating Hertzian contact pressure, see, e.g. Henriot [1] or the standard [2].

However, it is noted that Henriot's procedure to equalize $g_{s,max}$ when z_1+z_2 is small involves the use of $a'>a$; and it is easily recognized that the maximum contact pressure does not occur at the pitch point. These facts raise an interest in clarifying (i) which disadvantage in terms of balanced $g_{s,max}$ will be associated with the use of $(x_1+x_2)=0$, and (ii) what is the difference between the maximum and pitch point contact pressure.

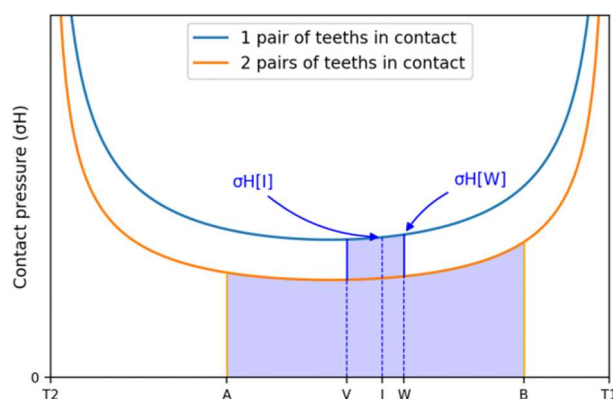
As regards balancing $g_{s,max}$, when using symmetric profile shift values $(x_1+x_2)=0$ the center distance is maintained, but if using x_1 different from $-x_2$ the consequent a' different from a can be inconvenient for the designer. It is therefore relevant to quantitatively evaluate the difference between $g_{s,max}$ using non-symmetrical or symmetrical profile shift.

Although ISO 6336-2 specifies the calculation of the Hertzian contact pressure at the pitch point, it is likely that at another point along the contact line the contact pressure will be higher, raising the question of quantifying the difference between the maximum and pitch point contact pressure.

Python codes were developed for both problems, and results over wide range of input data presented graphically. The ratio of $g_{s,max}$ values using symmetrical or non-symmetrical profile shift was found to increase with decreasing z_1 (for identical $i=z_2/z_1$), reaching near 3 for $z_1=15$ and $i=2$. As regards contact pressure, the difference between maximum and pitch point values was found to increase with decrease in z_1 (for identical $i<5$), and reached 33 o/oo for $z_1=15$ and $i=2$.

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Hertzian contact along gearing

- 16712 | Clinical pharmacokinetic study of a drug via in silico sublingual administration

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The study of the pharmacokinetic behavior of new chemical entities is an essential part of the successful development of a new drug. In the last decades, numerous in silico methodologies have been developed for the research of new drugs mainly focused on the study of pharmacodynamic, pharmacokinetic and toxicological parameters. Those methodologies have as main goal to optimize the whole research work of new drugs and thus to obtain the greatest possible amount of data about the molecule of interest precociously.

In this project, we used the GastroplusTM simulation software to the in silico study of pharmacokinetic profile of a drug. First, we used this methodology to compare the simulated pharmacokinetic profile to the one obtained found in conventional experimental studies like clinical trials and then we studied the applicability of this methodology to solve a practical case of a drug that presented an unfavorable profile. This drug was used in clinical trials to Alzheimer's and Huntington's diseases, having shown promising results in the first trials, but the results of wider trials were disappointing, and it was abandoned by the pharmaceutical industry due to lack of therapeutic efficacy. Suggesting a pharmacokinetic problem being a main cause to the lack of efficacy, we used GastroplusTM to explore in silico the advantages of using another route of administration then through immediate-release tablets, in the case a sublingual formulation, to improve drug's pharmacokinetic profile.

- 16713 | NOVidade: implementation and evaluation of an intergenerational program with elders and university students

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Today's society is no stranger to social stratification along generations and its consequent distancing between young and old. This phenomenon has contributed to a growing lack of knowledge on the realities of each generation, as well as to an increase in ageism, loneliness and low social cohesion. In response, intergenerational programs are viewed as one of the possible social vehicles through which different generations can develop mutual meaningful relationships, while promoting meaning construction and life purpose.

This study presents the construction, implementation and evaluation of an intergenerational program that involves 9 elderly women and 7 female university students as participants. Following a quasi-experimental methodology, it compares the participants' group to a control group composed of 5 female elders and 9 female university students. It refers to an action research project, based on a mixed approach (quantitative and qualitative) of data collection and analysis. The following scales were administered pre and post-intervention: Inventory of Psycho-social Balance (IPB; Domino & Affonso, 1990; Portuguese version developed by Veiga, 2004), Philadelphia Geriatric Center Morale Scale (Lawton, 1975; Portuguese version by Paúl, 1992) and the Intergenerational Activity Questionnaire (Dellmann-Jenkins, 1997). Qualitative data were obtained through two focal interviews (one for each generation) and through the analysis of participants' logbooks.

Results showed positive effects of the implementation of this program in both generations, especially in terms of reduced ageism in the young and loneliness in the elderly. This study seems to sustain relevant impact, as its contributions may enhance the development of other programs alike, promoting generation closeness, ageism reduction and personal development through intergenerational contact.

Keywords: Intergenerational program; Ageism; Personal development; Identity; Generativity; Integrity.

- 16714 | Environmental control of planktonic communities in a coastal Marine Protected Area “Parque Natural Litoral Norte (PNLN)”.

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Planktonic communities as ichthyoplankton (eggs and fish larvae) are one of the most important components of marine ecosystems, responsible for fundamental processes that support marine communities. This study investigated the environmental control (abiotic and biotic parameters) of the ichthyoplankton dynamics in the Parque Natural do Litoral Norte (PNLN), a coastal Marine Protected Area in the NW Portugal. Since autumn 2017, seasonal sampling surveys were conducted in 9 sampling stations along the PNLN. At each sampling station, planktonic trawls were carried out using a 150 µm mesh conic net for zooplankton, and a 500 µm mesh planktonic net for ichthyoplankton. At each sampling point, vertical profiles of water physical-chemical parameters were measured, and surface and bottom water samples were collected for further laboratory quantification of nutrients and chlorophyll a, total particulate matter, and particulate organic matter. A total of 4325 fish larvae were collected, belonging to 29 different taxa. *Parablennius gattorugine* was the most abundant species, with an abundance peak in spring of 2018, followed by *Ammodytes tobianus* that was more abundant during winter 2018. *Clupeidae* spp. was the third most abundant taxa, mainly in summer of 2019. These taxa abundance peaks coincided with higher values of chlorophyll a and zooplankton abundance. In general, ichthyoplankton abundance had a clear seasonal trend, with higher numbers during winter and spring seasons, coinciding with increase of particulate organic matter content. Also, ichthyoplankton abundance near the Cávado river mouth was generally higher. Overall, ichthyoplankton was seasonal and spatially controlled by biotic and abiotic parameters, as the availability of food and favourable water conditions for early life stages of fishes.

Acknowledgements: This study was partially supported by OMARE project (POSEUR-15-2016-54) and Strategic Funding UID/Multi/04423/2019 of FCT.

- **16716 | SCHOOL BUILDINGS REHABILITATION AND ITS' PATRIMONIAL VALUE**

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Based on the ongoing master thesis work in Architecture¹, this research aims to study the strategy of rehabilitation of pre-existing school buildings in relation to their patrimonial value, developed in PMEES². From the analysis centered on the universe of 74 schools, the architecture method as an axis from the personal and pedagogical relations intent to understand how the school building were readapted and transformed in the process.

The Program has been acknowledged by its' ability to keep a significant portion of the original buildings as well as the construction area, redesigning the school and modernizing the high school public buildings, ensuring that this could bring communities closer with a stronger social, cultural, civil and economical dimension. In addition, this new school model incorporates responses to the needs and innovations of the reality and contemporary pedagogical dimensions.

Throughout the process, the place, memory and identity of the schools were considered as pre-existing essentials conditions encouraging the rehabilitation regardless of the patrimonial and architectural value of each of the buildings. Recognizing the public character of the institutions and recalling buildings with different times and types, the PMEES (re)defines a new school building condition and architecture responsibility. In this context, all the buildings contributed as a positive and operational material in their transformation process, marking a potentially pedagogical and applicable process to the public buildings' management with other functions. The strategy, centered in the rehabilitation of a large built complex, declared a conjuncture that settled for the buildings survival, using a sense of innovation towards the future from the process that consolidates a concept of global patrimonial value.

1 Under the supervision of Professor Doctor André Santos

2 "Programa de Modernização das Escolas com Ensino Secundário" developed by Parque Escolar since 2007.

- 16717 | Modelling p53-MDM2/X interactions with C-5 curcuminoids

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The p53 protein is a key tumor suppressor. However, this protein is often inactivated by its endogenous negative regulators MDM2 and MDMX. Therefore, the disruption of the p53-MDM2/X interactions represents an efficient and selective therapeutic strategy against wt p53-expressing tumors[1].

C-5 curcuminoids are a class of compounds known for their antitumor activity[2, 3], nevertheless, the interference in the p53-MDM2/X interactions remains unexplored.

Thus, a small library of C-5 curcuminoids was synthesized by aldol condensation and tested for their p53-MDMs inhibitory activity. The effect on p53-MDM2/X interactions was evaluated through a yeast-based assay previously developed by our group[4]. The obtained results showed that BP-C4 behaved as a potential dual inhibitor of the p53-MDM2/X interactions. These results were then validated in colon adenocarcinoma (HCT116), breast adenocarcinoma (MDA-MB-231), and normal fibroblast (HFF-1) cells. In HCT116 cells, BP-C4 caused cell cycle arrest and apoptosis, increased the p53 levels, upregulated the expression levels of p53 target genes p21 and PUMA, and caused PARP cleavage. Altogether, the results hereby presented reveal a new potential dual p53-MDM2/X interaction inhibitor.

#Authors contributed equally to this work

References:

[1] Lemos A. et al., Med. Res. Rev., 36 (2016) 789-844; [2] Modzelewska A. et al. Bioorganic Med. Chem., 14 (10) (2006) 3491-3495; [3] Selvendiran K. et al. Biol. Chem., 282 (39) (2007) 28609-28618; [4] Soares J. et al., Mol. Oncol., 11 (6) (2017) 612-627.

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- **16719 | Use of probiotics in the control of biofilm formation in urinary catheters**

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INTRODUCTION: About 80% of urinary tract infections (UTI) are associated with catheter infection. The high susceptibility of urinary catheters (UC) to bacterial contamination can lead to the development of biofilms on the surfaces of the devices. The primary treatment of UTI includes the use of antibiotics, but the growing resistance of pathogens has led to a poor response to antibiotic therapy. Thus, new approaches are needed to treat and prevent UTI. Probiotics have been described as having ability to displace adhering uropathogens and inhibit bacterial adhesion to catheter materials. The aim of this work was to evaluate the effect of two probiotic strains (*Lactobacillus plantarum* and *Lactobacillus rhamnosus*) on pre-established *E. coli* biofilms.

METHODOLOGY: *E. coli* biofilms were grown on silicone coupons placed inside 12-well plates containing artificial urine medium. The plates were incubated at 37 °C in an orbital shaker to mimic the hydrodynamic conditions found in UC. After 24 and 48 h of incubation, the *E. coli* biofilms were exposed to probiotic suspensions for 6 and 24 h. CFU (colony-forming unit) counts and crystal violet staining method were used to determine the cell culturability and total biomass of the biofilms, respectively.

RESULTS: Both probiotics reduced the *E. coli* culturability, mainly in the 24-h biofilms (58% and 38% after 6 and 24 h of exposure, respectively, with *L. rhamnosus*; 60% and 25% after 6 and 24 h of exposure, respectively, with *L. plantarum*). 48-h biofilms seemed to be less susceptible to probiotic action. Although probiotics caused significant *E. coli* killing, they did not reduce the biofilm mass.

CONCLUSION: These promising results suggest the potential of *Lactobacillus* strains to act against uropathogenic biofilms developed on polymeric surfaces, which will pave the way to further experiments on the topic.

- **16720 | THE IMMUNOMODULATION POTENTIAL OF PANCREATIC CANCER EXOSOMES**

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Pancreatic ductal adenocarcinoma (PDAC) is a lethal cancer with an overall survival of 8% past 5 years. Chemotherapy and radiotherapy are the only treatment options available. Immunotherapy has yielded remarkable clinical results, but it is still not applicable to PDAC, which is considered an immunotherapy-resistant disease. Although PDAC presents tumor-specific neoepitopes and low mutation burden, the immunosuppressive microenvironment suppresses T cell activation. Altogether, these unfavorable conditions lead to the inefficacy of immunotherapy in PDAC. Our data shows the immune system is not blind to PDAC. Thus, it is of utmost importance to determine how can we make PDAC immune responsive.

The role of cancer exosomes in reprogramming target cells in the tumor microenvironment, potentiating tumor progression and invasion, is well established. Using unique genetically engineered mouse models (GEMMs) that secrete color-coded pancreatic cancer exosomes, we observe that cancer exosomes communicate with cells of the immune system, such as CD4 and CD8+ cells. Using a small molecule inhibitor to impair exosomes secretion in GEMMs of pancreatic cancer, the progression of the disease is slower and tumors have a distinct immune landscape with increased infiltrating CD8+ cells.

Therefore, we HYPOTHESIZE that PDAC cancer exosomes are instrumental in immunomodulation, establishing and maintaining an immunosuppressive microenvironment, leading to immunotherapy failure in PDAC. We EXPECT to demonstrate that a combination of targeted therapy to inhibit cancer exosomes and immunotherapy could result in a significant improvement in patient survival.

- 16721 | Towards the 2020 Olympics: Climbing as space for education, citizenship and political participation

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Macedo, Eunice, Faculdade de Psicologia e Ciências da Educação da Universidade do Porto, Portugal

Dias, Teresa Silva, Faculdade de Psicologia e Ciências da Educação da Universidade do Porto, Portugal

Acting within the multi-disciplinary field of Education Sciences, this work aimed at looking at climbing from the standpoint of education as an educational environment that fosters the development of citizenship skills. The climbing environment was considered in this research mainly in its non-formal and informal aspects, in the broader sense of education throughout life. We build on the conviction that these non-formal educational processes may produce positive feedback on society. We believe these processes allow developing values that are at the basis of citizenship. These assumptions guided the research object.

This research was conducted as a qualitative case study. 21 interviews were conducted with male and female climbers during the World Climbing Championship in Innsbruck, Austria in September 2018. It is important to emphasize the special importance of this event, as it was the first part of a procedure aimed to integrating climbing into 2020 Olympic Games. This contributes to an interpretation of the interviews that pays special attention to the interactions between proximal and distal contexts and systems of the individuals in Bronfenbrenner's human development ecological perspective (2011). Three categories emerged: climbers' life trajectories; the construction of a particular ethos in the climbing community; impact of climbing presentation at the 2020 Olympics.

The work shows that climbers find in climbing a form of identity construction, through which it is possible to live and interpret individual and community developmental situations of the individual and the community. The work also evidenced that for climbers the identity of the climbing community permeates the climbing context and supports their awareness. This enables the climber to develop citizenship skills.

KEY WORDS: Education, climbing, citizenship, participation

- **16723 | DEMOCRACY SCHOOL AS INNOVATION IN THE ARCHITECTURAL PARADIGM OF THE SCHOOL BUILDING**

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Contemporary times have been characterised by emerging transformations with results in the teaching-learning processes, making it appropriate to reflect on a present model, capable of continuing the ideal of democratisation and universalisation. From the 80's, the architecture needed to answer those needs, proposing a school building based on a standardised strategy of pavilion typology called "3x3", which allowed a massive construction buildings in the national territory (1) with controlled financial resources and time. This resulted as a setback in some of the values that had been characterizing the school equipment, such as the relationship with the urban context, the diversity and spatial hierarchy, the constructive quality, the different expressions of the buildings and the adaptation to the climatic contexts.

With the rehabilitation intervention conducted by PMEES (2) , those buildings, of lower architectural and constructive value, were rehabilitated with the aim of adapting to a new type of school. The research work (3) intends to develop a reflection on the architectural interventions of this typology, understanding how the conditions of the pre-existences conditioned or encouraged the authors' options, in response to the Parque Escolar ideals.

Effectively, the pavilion condition dispersed throughout the school, provided several options and architectural results, allowing the goal of making the building a unique organism, in most cases, the incorporation of social and collective aspects of the program in an articulated way, with an agglutination strategy that, using circulation systems, encouraged the ability to integrate diverse functions, including spatial conditions for the achievement of informal learning.

1 Planned to build 218 schools in 7 years

2 Secondary School's Modernization Program developed by Parque Escolar since 2007

3 Inserted in the research project ESCOLAS: Complexidade e Interpretação coordinated by Professor André Santos

- **16724 | THE CLASSROOM: BETWEEN INNOVATION AND RESILIENCE**

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Regardless of the teaching model practiced in Portugal, the classroom ensures the condition of cellular space in the context of the school organization. Repeating this use, structures the essence of "being" school.

Reflecting from various examples, it becomes unavoidable to recognize an image shaped by a rectangular space, oriented unidirectionally, to the side where it is "taught", occupied by a desk and one (or more) boards. The space is mostly filled with a sequence of tables and their chairs. If the entrance door is positioned on a wall shared with the circulation space, the opposite wall will share a relation with the outside through a set of windows, defining the stereotype of the classroom.

However, more recently, and in particular with Parque Escolar's rehabilitation intervention, the incorporation of factors varying from thermal comfort and ventilation, lighting, aesthetics, safety, technological infrastructures (projection and interactive board), internet networks, to even school furniture, claim a design for innovation. Still, the ambition enhanced for a higher level that goes beyond the conditions mentioned, made possible for an effective multipurpose and multifaceted use eventually, and only verified in the specialization intended to the laboratory, workshop, informatics, expressions and design activities.

In one hand, there seems to be a greater demand for innovation and flexibility, responding to pedagogical challenges, on the other hand, there is a significant resistance to change, persisting its essential characteristics and maintaining the practices of use.

This investigation 1 has as its main goal to analyze the evolution of the classroom space and to understand what dialogue has been placed between the design of innovation and the resilience condition that the spaces (and their users) play.

1 - Integrated in the research project ESCOLAS: Complexidade e Interpretação (FAUP), under the coordination of Professor Doctor André Santos.

- **16732 | SCHOOL ARCHITECTURE AND SOCIAL INCLUSION**

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This research focuses on addressing an essential topic – Social Inclusion – determining responsibility in all areas, and from which school architecture can't be unrelated or dismissed of. School, since its origin, has been affirming an historical social evolution that, adding various sciences, such as education and psychology, aim at improving educational practices. Thus, pedagogy incorporates ideals of insertion, worrying about universal integration and the links between school collective and local community.

And in order to ensure a superior articulation of these designs, architecture is called upon to intervene in congregation with the other sciences, perpetuating that, from school equipment, the objective of universal integration is intended.

The School building has been accompanying us since childhood and it can be said to be the more intensely frequented space throughout life, where education is enriched, personality and purposes are influenced by and where humanism is stimulated. It is from this awareness that the study seeks to expose the importance of architecture in the pursuit of universal inclusion, regardless of the disabilities, physical or cognitive limitations, in order to ensure, to all users and society as a whole, the maximization of life quality and dignity ensuring.

Thus, this work seeks to express the social role of the architect and the responsibility of architecture, as a positive contribution to minimize fairness conditions.

In this sense, it will seek no analyze the school as equipment of social inclusion, identifying their capital gains but also, and above all, the shortcomings that the purpose of ensuring the adequacy and universality of a school space for all still inhibit.

The presented abstract is included in the development of the master's thesis in Architecture (FAUP) under the orientation of Professor André Santos.

- **16733 | Health determinants and associated factors in city hall employees: contribution to workplace health promotion**

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Afonso, Cláudia, Faculdade de Ciências da Nutrição e Alimentação da Universidade do Porto, Portugal

Introduction: The workplace is recognized by the World Health Organization as an important area of action for the promotion of healthy lifestyles.

Objectives: Evaluate, in employees of a city hall, the factors that were considered as determinant for health and its association with other social and lifestyle factors.

Methods: 118 employees participated in this study, evaluating social data, the self-perception of health condition, the factors that were considered as determinant for health, involvement on physical activity, smoking habits and hours of sleep. The data descriptive analysis was followed by uni and multifactorial analysis to characterize the study sample according to the defined objectives. For statistical analysis, the chi-square test, the T-student test and the Mann-Whitney test were used, as well as logistic regression analysis.

Results: Diet (71.2%), physical activity (31.4%) and stress (26,3%) were the factors that respondents considered to have the greatest influence on health. Regardless of gender, academic qualifications, professional category and the practice or not of physical activity, the majority highlights the diet as a determining factor for health. The group most likely to choose diet as a determinant of health were men (OR=1,877), those who were older (OR=1,048), those who had an higher BMI (OR=1,135), those who perceived themselves as healthier (OR=1,753) and those who had higher academic qualifications (OR=2,432). Similarly, those who mentioned physical activity were males (OR=1,157), were older (OR=1,104 and $p=0,022$), had an higher BMI (OR=1,028), sleep more hours (OR=1,174), practice physical activities (OR=5,133 and $p=0,014$), perceived themselves as healthier (OR=1,306) and had higher academic qualifications (OR=6,264 and $p=0,007$).

Conclusion: These results highlight the need to implement nutritional interventions in the evaluated workplace.

Keywords: determinants of health; nutritional interventions; health promotion; workplace

- **16734 | Know how to make architecture: from didactics to practice in a parallel between Porto and Oslo**

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What does it imply to know how to do architecture? The entire discourse and development of the present dissertation came from the urge to discover some answers to this challenging inquiry. Having the author's educational experience - at the Faculty of Architecture of the University of Porto (FAUP) and the Oslo School of Architecture and Design (AHO) - as a starting point, this brief research intends to explore the richness and complexity that define the vast universe of architectural theory and practice.

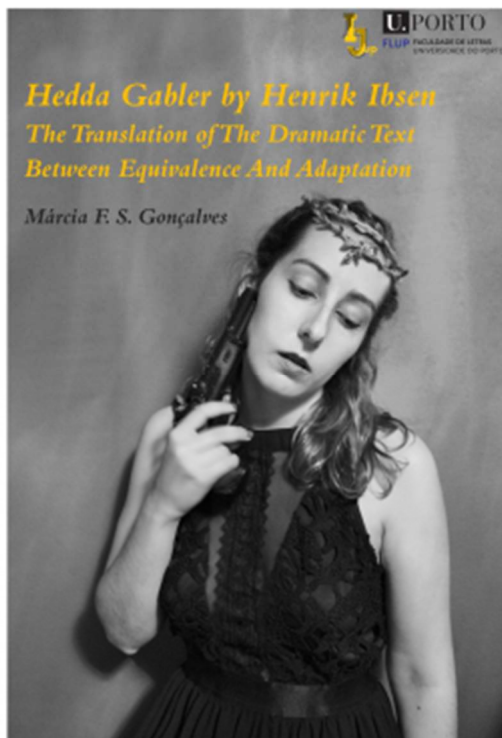
To accomplish that was crucial to introduce the bases for a phenomenological approach to the concept of "space", as well as disclosure the psychological processes involved in its perception. From there, it became possible to better understand the work of the Norwegian architects Arne Korsmo, Sverre Fehn and Christian Norberg-Schulz and establish a parallel between them and their Portuguese counterparts: Fernando Távora, Álvaro Siza and Eduardo Souto de Moura. Therefore, their unique ways of thinking and designing allowed the analysis of modern society from a new perspective.

However, the field of architecture - throughout this entire procedure - has proven to be considerably more demanding than what was initially expected, showing signs of fragility both in the academic and in the professional world and having its social importance always questioned. With this investigation, it was aimed not only to outline the primary problems that architects have to face daily but also to recognize how to prepare future generations for the uncertainty that awaits them.

- 16735 | Hedda Gabler: The Translation Of The Dramatic Text, Between Equivalence And Adaptation

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Theatre translation is a field of study to which comparatively little attention has been given within Translation Studies, despite the vast amount of translations that have been completed within the theatre universe. Hedda Gabler by Henrik Ibsen, published for the first time in 1890, is, as of today, one of the most frequently staged theatre plays ever. The corpus used for the work presented here was a translation of the play for Portuguese by Freire de Andrade, published by Editorial Presença in 1968. It is an indirect translation, from a version by Una Ellis-Fermor, published by Penguin Classics in 1950. It is the first version on record in Portugal and it remained the only translation of this play for forty years. The main objective of our research was the analysis of Freire de Andrade's translation, with the main purpose of establishing the incidents which compromise the source text. The studies and theories developed and proposed by Susan Bassnett are at the centre of the theoretical framework that supports this dissertation, in conjunction with Christine Zurbach and authors from Translation Studies, such as Venuti and Nida, who propose, in various ways, equivalence in translation. After the identification of the type and frequency of the occurrences of incidents in the translation, it was understood, from the results, that the differences which alter the source text produce repercussions that can be considered negative.



Hedda Gabler, Suicide by Translation

- **16736 | Architecture of the Essential: A Phenomenological Approach**

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"(...) I hope for a new awareness of the tactile dimensions of material and detail, light and space understood from the point of view of individual human experience - a phenomenology of architecture."

Steven Holl's quote evokes the series of symposiums entitled "Alvar Aalto Symposiums" which began in 1979 and have been held every three years since then, whose main purpose is to give rise to reflections on the artistic, social and technical problems/aspects of architecture.

From a careful reading on the first four of these Meetings held in 1979, 1988, 1991 and 1994, with the discussion topics: "Alvar Aalto vs. The Modern Movement", "Architecture and Cultural Values", "Functionalism- Utopia or Way Forward" and "Architecture of the Essential", respectively, we intend to research into the theme set on architecture of the essential through the understanding of the essence of architecture i.e. the notion of architecture as an built idea, an idea of space and a sense of atmosphere within the conditions of place, programme and architectural intent.

Thus, the aim of this work is to evoke the sensorial side of Architecture, valuing individual human experience, having as a premise the contribution of the different protagonists who participated in these Alvar Aalto Symposiums, in order to reflect on the poetic discourses and tactile dimensions in play underlined by the different design themes and architectural notions.

The deepening of these notions aims to understand how this question of sensitivity, the idea of architecture perceived as spatial narratives - atmospheres - is fundamental to better understand the condition of Contemporary Architectural discourses.

This study is part of an ongoing master thesis on Master's Degree in Architecture, at FAUP, 2019/20, under the supervision of Helder Casal Ribeiro.

- **16737 | Splenic implications of high intensity eccentric training in Wistar rats**
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Introduction: High intensity physical training with inadequate rest may compromise the functionality of the immune system. In this system, the spleen is responsible for antigen uptake and presentation as well as lymphocyte stimulation. The purpose of the present study was to analyze splenic alterations in rats submitted to eccentric training of high intensity with short periods of rest. Methodology: Fifteen male Wistar rats were randomly allocated into two groups; a control group (CG, n=5, 161.8 ± 7.05g) and an exercise group (GE, n=10, 164.7 ± 16.82g). The GE animals were then divided into two subgroups; GE1 (n=5, 158.8±16.32g) sacrificed after 1 week of training, and GE2 (n=5, 170.6 ±16.83g) sacrificed after 3 weeks of training. The animals were subjected to an enforced treadmill running program with 20° downhill inclination and a progressive increase of 1.25 meters/minute of intensity in each session (3 weeks, 6day/week,1 hour/day). Following the sacrifice, the spleen of each animal was excised, weighed, and prepared for histological analyses in order to evaluate the organization level, the number of germinal centers, and the areas of white and red pulps. Results: GE2 showed a decrease in relative spleen weight compared to GE1 (p<0.05). Significant differences were found between different groups (p <0.05) in the areas of the white pulp and red pulp. GE2 showed a decrease in white pulp area compared to CG and GE 1 (p<0.05). Compared to CG, GE showed a higher percentage of moderately disorganized follicular structures (GC: 20%; GE1: 50%; GE2:60%), while GE2 showed highly disorganized structures in white pulp areas (GC: 20%; GE1: 20%; GE2: 40%). Conclusions: A high intensity physical training protocol with short periods of rest altered the areas and the splenic structural organization, suggesting one negative impact on the immune system.

Keywords: Exercise; mechanical stress; immune system; spleen; histology.

- **16739 | SPACE REORGANIZATION AS A DIALOGUE STRATEGY BETWEEN ARCHITECTURE AND PEDAGOGY**

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The theme focuses on the paradigm of space-functional reorganization as one of the engines of spatial and pedagogical transformation in the school architecture rehabilitation operation, using PMEES(1) as a case study.

School architecture symbolizes and constitutes an engine of expansion and transformation of cities and society, becoming a topic of extreme relevance in the disciplinary field of architecture. In an era of intense transformation, teaching-learning methods also evolve, adapting to the constant metamorphosis of society.

In this regard, the PMEES found the opportunity, not only in the necessary architectural rehabilitation of school buildings, but also in the spatial adaptation to the new pedagogical models. More than the construction of new buildings, intervening exclusively in pre-existences was defined as a unique strategy, forcing them to be considered as operative material for their readaptation to a projected idea of the school for the future.

Those objectives implied a spatial and functional reorganization, based on the Conceptual Model, rethinking each space and its symbology for the school community, as well as the hierarchization and correlation between them, aiming at creating conditions for a more flexible and informal learning.

The legitimacy of this investigation is based on the protagonism that the space-functional reorganization assumes in the transformation of the school architecture. It also intends to deepen the study of how architecture can implement and transform the teaching and learning methods, contributing to the debate of the relations between Architecture and Pedagogy.

This study is part of an ongoing master thesis(2).

1-The Programa de Modernização do Parque Escolar destinado ao Ensino Secundário (PMEES) was launched in 2007 by Parque Escolar.

2-The master thesis is integrated in the research project ESCOLAS: Complexidade e Interpretação, both coordinated by Professor Doctor André Santos.

- **16740 | Sexual child offenders offline and online: Exploratory study**

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With the growing technological development observed in different societies, the phenomenon of sexual abuse of minors has not only taken on new forms, but has also exceeded physical and geographical limits, enabling the emergence of new types of sexual crimes, as a result from the increasingly contact between adults and minors using the virtual world. Little is known about these changes, particularly at a national level. In this sense, the present research has an exploratory nature, aiming at understanding the main similarities and differences between the motivations and strategies of online sexual offenders, involved in crimes committed against minors through the internet, and offline (or hands-on) sex offenders. The aim was to understand their behaviors, alongside the process that starts with specific dynamics and strategies of selection and approach of potential victims until the cessation of contacts. In order to carry out our study, we used a qualitative methodology, with triangulation of information sources and data: the contents of six legal proceedings on sexual crimes against minors were analyzed, six in-depth interviews were conducted with 'privileged informants' (victims, offenders and a privileged informant on platforms and access routes to child pornography). In addition, a search was performed on titles of videos accessible on the internet that referred to pornographic content that could involve minors. The transcripts of the interviews and the judicial documents were analyzed through a procedure of content analysis. The analysis and interpretation of the results showed a high similarity between the behaviors and motivations involved in the two types of modus operandi, despite the difference in contexts, with the strategies used in the context of direct physical contact being mainly adapted to the online context.

Keywords: Sexual Abuse; Sexual Grooming; Grooming Online; Internet; Minors

- **16741 | Motion Graphics: Study Enhancing Tool**

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Seixas, Teresa, Departamento de Física e Astronomia da Faculdade de Ciências da Universidade do Porto & Centro de Investigação da Terra e do Espaço da Universidade de Coimbra (CITEUC), Portugal

We present a thesis work, within the FEUP Master Degree in Multimedia, on the use of motion graphic animations as a means to enhance university level students' learning process.

Two animations were made for a FCUP course, Physics II 2018-19, about the concept of magnetic field, a subject usually difficult to understand by many students. The objective was to approach a complex theme in a quick, elegant, and visually appealing way. A survey was given to the students, wherein they reported their take on how the animations helped them, and how much they would use such tools. While not conclusive, due to having a sampling of only 28 students, the results are encouraging, with the students participating in the survey having given a very positive feedback, both in considering the animations as helpful, and widely recognising it as a tool they would regularly use.

Regarding future applications, it was considered that the results justified a further research, approaching more thematics, widely broadening the number of students, and creating control groups to further attest both the efficiency and the effectiveness of motion graphics as a study tool for university students. In case the results are satisfactory, this could turn out to be a very useful tool, helping some core concepts easily reach more students, while providing a way for education institutions to keep up with more modern tools, taking advantage of both modern resources and language.

Other advantages are the ease of production, since each animation can be developed in a relatively short time, the widespread of different approachable subjects of any scientific area and the endless durability this type of media has. Also, due to the interchangeability of scientific concepts studied among several universities worldwide, this too could provide a profitable, and easily exportable product.

- 16743 | Water as a vital space: Potential use and reuse of the water element in the public space of cities.

Carvalho, Ana Clara Bessa Duarte, Faculdade de Arquitectura da Universidade do Porto, Brazil
Coelho, João Rodrigo Parreira, Faculdade de Arquitectura da Universidade do Porto, Portugal

Water, vital element for the planet and the species that inhabit it, has always been one of the main factors in the selection of spaces to be occupied. However, during the evolution of cities, the relationship between society - city - water took different positions.

During the formation of the first settlements, water was a major factor in the design and development of these sites, due to the important geographical role and the outstanding characteristics linked to the needs of the population and the functions assigned to them. However, over the years, the domination of nature by man assumed a radical transformation in the environment that sustained it, which generated an imbalance in the city-society-environment relationship.

The Waterfronts projects come from the 20th on the pretense of a new vision for water sites. The aim of these projects was to search for the occupation of these previously obsolete sites in the urban fabric, but these investments were mostly more interested in creating sites that would promote a new city image than a connection with water. With the changes over the centuries in these relationships, the need for rapprochement of these elements has become of great importance today for a better quality of life. It is necessary to rethink the urban landscape on the human scale in order to "create the city" as an interconnected system, bringing public space and the environment closer to people's lives.

Therefore, this paper, which is part of an ongoing master's thesis in Architecture, at FAUP, 2019/20, aims, through a temporal analysis of the different relations between society-city-water, to think of a new vision of the city, which water is used as an organizing and enriching element of public space. For this, we will analyze 3 projects (Vístula River Park, Mira's Lake and Watersquare) that reinsert water as an important element in cities, following the principles of sustainability and generating sites to meet the needs of the local population.

- **16744 | Asbestos Roofing Detection with Sentinel - 2 Data**
Pinto, Pedro S., Faculdade de Ciências da Universidade do Porto, Portugal

Since the 1960s international studies have establish a cause effect relation between the exposure to asbestos and lung cancer. Public authorities face a tremendous task to identify and certify the removal of all hazardous materials from private and public buildings. Recent laws have been compiled to impose strict prohibition of asbestos in construction applications and human resources have been trained for the task of validating the compliance of the law in partnership with union labors and other entities. Seizing the opportunity of the mentioned national intentions, a test was done, using Sentinel 2 multispectral images (S2MSI) to detect the spatial distribution of asbestos and the evolution over time (change detection) for the same material. A combination of supervised classification, with unsupervised and spectral unmixing algorithms on software SNAP (Sentinel Application Platform), provided a precision from 70 to 91%. The experiment demonstrated that it is possible to identify land cover distribution and change detection of asbestos in building roofs scattered around Porto.

Results from the academic mini-project, applied to the Porto municipality, have shown, based on geospatial samples taken from a national survey and from classification results over a S2MSI, from 02/09/2018, that between the administrative limits of Porto, about 3.1% of all the area was covered with asbestos roof tiles, an equivalent to 1.30 km². An illustration of the results is submitted in attachment, where it can be seen change detection of the asbestos roof tiles, based on the comparison between two multispectral images from the same location, one from 2015 and other from 2018.



Change_Detection

- **16745 | Perceived Problems of Beginning PE Teachers**

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Teacher training aims to be a personal, social and professional training for future teachers, providing them knowledge, technical, scientific and pedagogical formation, vital to their performance. It is, however, a complex process of multifactorial interferences regarding the vigorously unpredictable and contingent activity that teaching is, and attending to the abrupt and demanding character that portrays professional induction.

The purpose of this study was to analyze and understand the problems perceived by pre-service teachers who were attending their Practicum Training, in the Faculty of Sports of the University of Porto in 2018/2019.

Designed as an inquiry study, its sample consisted in 53 intern pre-service teachers within the Practicum Training, included in the Master's Degree in Teaching of Physical Education in Basic and Secondary Education of the Faculty of Sports of the University of Porto, besides the author.

In its methodology took place a quantitative analysis of the respondents data, through SPSS 25, using relative and absolute frequencies, and also a qualitative analysis, crossing that data with the analysis of cases that occurred during the Practicum Training of the author, through a thematic analysis of his written reflections.

The obtained results revealed that classroom discipline, knowledge of subject matter, and inadequate school equipment were the problems most frequently addressed by the participants. From the data analysis and consequent presentation and discussion of results, it was concluded that the praxic component of the mobilization of knowledge and the own experience of each intern teacher, in the form of "learning-while-doing", are success predictors in solving these problems, in which the teachers professional identity and personality are decisive in the way the teacher perceives and acknowledges them, in a consequent indissociation of the professional domain.

- **16746 | "What I need is love": A Qualitative Study about the Impact of Social Interactions in Recovery from Drug Misuse**

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Although substance abuse treatments in Portugal have been including contextual factors in its interventions, there are still literature gaps to be considered, mainly regarding social support needs of the drug users. The present work is a part of DURESS project, an international study conducted in Italy, France and Portugal, funded by SICAD (General Directorate for Intervention on Addictive Behaviours and Dependencies), in the ambit of ERANID European project. DURESS intends to explore the contextual factors which have impact in the recovery process, using original and unexplored sources, based in drug users' experiences and opinions. For 7 months we followed 22 people who were in a recovery process, recruited from treatment teams. As for the method, participants were encouraged to write diaries, with the help of the researcher whenever needed, about their daily experiences, feelings, needs, thoughts, as well as their critics and suggestions to the system.

Social Support emerged as a crucial factor to recovery, which can be felt in the relation with the family, friends, partner, neighbours, health professionals or even with strangers. In this sense, the objective of the present study is to explore participants' perceptions on their personal relationships and their impact in recovery.

The results show the drug users' need of having someone to talk about their problems and someone who supports them. Thus, the feeling of acceptance, understanding and connection appeared to be fundamental in the process. The results also show the importance of building solid social networks between drug users, as well as the importance of intervene close to their families. Psychological aid and good relationship with health and social technicians are another crucial factor emerged. Instead of repressive approaches, this study reinforces the urge for more inclusive treatments and policies, based on unconditional acceptance, support and integration of the drug user in the society.

- 16748 | A novel facile *in-situ* synthesis of TiO₂ Nanoparticles on cotton fabrics with an enhanced Photocatalytic efficiency

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Titanium Dioxide (TiO₂)-based photocatalysts have been extensively studied due to their large application possibilities, such as environmental purifiers, sterilizing and self-cleaning agents. Following UV-photoexcitation, the TiO₂ photocatalyst generates an electron-hole pair, that leads to reactions with O₂ and H₂O atmospheric molecules that create superoxide and hydroxyl radicals. The greatest interest in the study of these materials is due to their high chemical stability, non-toxicity, high photocatalytic efficiency and reasonably accessibility. This work explores a novel facile *in-situ* synthesis of TiO₂ nanoparticles (NPs) on cotton fabrics, as an eco-friendly alternative with lower economic costs than the impregnation methods used in the textile industry, such as dip-pad-dry-cure processes. The use of these NPs in organic cellulose is even more prosperous because porous coating materials may resist to rinsing. Furthermore, a parallel comparison between SiO₂@TiO₂ Core-Shell NPs, anchored on cotton substrates, and TiO₂-Cotton, prepared by a hydrothermal route, will be established, regarding its photocatalytic properties. The *in-situ* methodology follows a sol-gel technique, using a titania precursor, and enables the growth and nucleation of the NPs at lower temperatures through a hydrothermal treatment. The influence of experimental factors on the structural and morphological properties of the coating have been studied by low-angle X-Ray Diffraction (XRD) and Scanning Electron Microscopy (SEM) techniques, as well as Thermogravimetric Analysis (TGA). Additionally, the photocatalytic activity of this system towards the photodegradation of Rhodamine-B has also been addressed.

- 16749 | João Antunes project for the Cathedral of Braga sacristy and treasure house: data reinterpretation.

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João Antunes (1643 - 1712) arrived in Braga by order of the Archbishop D. João de Sousa (1696 - 1703) with the commission to design a new sacristy for the Cathedral of Braga adapting the pre-existing structure to the new liturgical requirements. Later, these same royal architect was hired for the project of the treasure house, which will be already built under the ministry of the archbishop D. Rodrigo Moura de Teles (1704 - 1728).

A historiographic problem follows these two buildings, debated from Ayres de Carvalho to Robert Smith, among others, that the architect's work in the episcopal complex of Braga's Cathedral would sum up to the sacristy.

With this communication we aim to rectify this thesis and link the intervention of João Antunes on the treasure house also under his authorship, despite being two different architectures with different functions.

We sought to support the argumentation of this investigation in the reinterpretation of historical data already published, such as documental sources and architectural treaties, contextualizing these architectural interventions in the Cathedral of Braga within the artistic production of João Antunes.

As a result, we hope to contribute to the clarification of these so called historiographic problem by adding new outcomes to the interpretation of the constructive and artistic corpus of João Antunes.

- 16750 | The migration of the common snipe (*Gallinago gallinago*) in the Western Palearctic

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Climate change is modifying bird species distribution, behaviour, phenology and migration. Understanding migratory connectivity of migrant populations is fundamental to adjust management and conservation policies. Despite the advances in bird tracking technologies, bird ringing still provides a broad spatial and temporal data series. The common snipe (*Gallinago gallinago*) is a migratory bird, widely distributed in the Western Palearctic. It is also a game species. Consequently, its management and conservation constitute a complex task. We aim to test possible changes in its post-reproductive migration over the last decades. Given the current scenario of climate change, we hypothesise an increase in the angle of migration, corresponding to further north migrations. We analysed 20,934 ringing and recapture events of the species, registered on the data base of EURING (the coordinating organisation for European bird ringing schemes). We used generalized linear models to test temporal and spatial variations on the proportions of recaptures and to evaluate changes in the direction of post-reproductive migration of the Icelandic population and of those populations from the remaining Western Palearctic. The number of birds ringed varied over time; most of the records occurred after the 1960s, 5.7% where ringed as chicks and most recaptures were of dead birds, from which 72.1% were hunted. The proportions of birds recaptured varied among decades and ringing schemes. The mean value (\pm confidence interval at 95%) of the angle of migration of the Icelandic population was $150.5 \pm 4.6^\circ$ and for the remaining populations was $232.9 \pm 2.9^\circ$. On both sets of populations, between 1961 and 2010, the variation on this angle was not significant. Unlike expected, the common snipe may not be adapting to climate change. However, it was not possible to get the variation on ringing and recapture efforts. The communication between the regional ringing schemes and EURING must be improved.

- 16751 | Through Internetricad@s' cloud: navigating through the uses and effects of youth practices in digital social networks

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Contemporary youth is *internetricada* in online social networks (boyd & Ellison, 2008), spreading over their diverse life spheres. Young people see themselves as an integral part of a digital world, where influencers (the new profession of the 21st century) impose trends and opinions, and Facebook adds and WhatsApp groups can significantly influence elections. In this scenario, a series of changes, opportunities and concerns emerge and bring forth new and complex challenges at the global scale (Castells, 2007). Among these, and demanding further exploration, are the discourses about the potentialities and risks inherent in the digital experiences of young people, and the connection to their (decreasing) levels of civic and political participation.

Thus, this research focuses on how socioeconomic variables are relevant to distinguish different practises and experiences in the digital social networks and to understand the relationship between different uses of digital social networks, by young students with different profiles, and their digital literacies, and civic and political engagements.

We will present preliminary results of an ongoing survey study involving about 420 students - between 14 and 18 years old - from a school in the litoral north region of Portugal. This instrument was a self-report questionnaire which, on the first part included items relative to demographic and socioeconomic information; on the second part included dimensions about the online social networks, and political attitudes, behaviours (e.g., political interest and efficacy, off/online experiences of civic and political participation). Finally, it observed their perceptions about their digital literacy in a cognitive and in a critical dimensions. This presentation seeks to explore the diverse online practises of young people, and how these practises are related to different political attitudes and levels of digital literacy.

- **16752 | "Once a drug addict, always a drug addict": the role of stigma in recovery**
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 Cunha, Carolina, Faculdade de Psicologia e Ciências da Educação da Universidade do Porto, Portugal
 Gonçalves, Filipa, Faculdade de Psicologia e Ciências da Educação da Universidade do Porto, Portugal
 Leite, Ângela, Faculdade de Psicologia e Ciências da Educação da Universidade do Porto, Portugal
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This research is inserted in a larger European project, Drug Use Recovery, Environment and Social Subjectivity (DURESS), funded by General Directorate for Intervention on Addictive Behaviours and Dependencies (SICAD). The project's aim is to understand the influence of contextual factors in recovery of illicit drug misuse, doing so through qualitative methodology and by valuing the social actor's perspectives on the phenomena.

The present study focuses on only one contextual factor, stigma, and the main aim is to understand its influence in recovery. Therefore, we listened to the experiences, opinions and perspectives of 18 people from Oporto district who are enrolled in an opioid treatment program to understand how this stigma affects their treatment, in what contexts do they feel it more present and what could be done to address this issue. Health diaries were the methodological strategies used and each participant was involved for a period of around 7 months.

Data were analyzed through content analysis. The results show that there are many motives for stigma, illicit drug use being the most mentioned, and that stigma is present in varied life contexts, such as: society; authorities; healthcare; technicians; family; close relationships; workplace; drug market; and residential area. Also, internalized stigma is mentioned by most of the participants. The results also suggest that stigma has a negative impact on recovery, bringing clarity to its relationship with engaging in treatment, urge and frequency of substance use, negative emotional impact, isolation, reintegration, and general well-being. Results concerning identity management are reported, as well as potential solutions to decrease stigma.

In conclusion, it is suggested that stigma is a contextual factor that influences people's lives and recovery processes, which makes it an important factor to consider while planning interventions and drug politics.

- **16755 | SCHOOL ARCHITECTURE IN MATOSINHOS: THREE OPERATIONS OF CONTEMPORARY TRANSFORMATION**

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"...that the school becomes the place where the best citizens are taught, free, demanding and more capable of intervening in their society, they become agents of change and evolution." (PINHEIRO, Eduardo, 2016)

The present work has as motivation the study of the modernization operations of the architecture of the schools in the city of Matosinhos. We analyze the contemporary initiatives advocated in the city center's schools, to understand the discourse and strategies promoted in the introduction of current constructive and pedagogical requirements, and in the educational environment's renewal.

The School is one of the main public buildings in a city, it's one of our references, and is a part of our memory. It is not just about the ways of teaching and learning in each time and place, it's where knowledge converges, a place where the new generations are taught. The school, as a public institution, reflects the political, social and cultural concerns of each era, both in the organization of its interior spaces, as well as the constructive techniques used, and in a way it positions itself within the socioeconomic level of each community. School buildings have always been seen as an epicenter of territorial development, requiring a permanent capacity for dialogue and adaptation to the different realities faced by each generation.

Through a course of constant and gradual approach to the process of contemporary modernization, a portrait of the historical context that framed the construction of the schools is made, describing, then, the geographical position and the evolution of the urban fabric where they are inserted. Finally, the study of the different operations to which these school buildings were submitted is carried out. It is through this framework that we will try to understand the current strategies of school modernization, establishing a bridge between the past and the present, from the time construction to its contemporary transformation.

- 16757 | Zang Tumb Tumb - The Influence of the Futuristic Performance on Contemporary Theatre

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The Futuristic Movement, led by Filippo Tommaso Marinetti in the early twentieth century, revolutionized the field of fine arts, dance, cinema, theater and music. In fact, the futuristic artist, regardless of his background, tended to explore all areas. Luigi Russolo was a painter before turning his attention to music, Umberto Boccioni wrote numerous pieces, although they were sculptors and painters, and painter and writer Arnaldo Ginna was responsible for the first futuristic film: "Vita Futurista".

Despite the multiple possibilities of intervention, it is the field of performance that concerns this paper. Disruptive and violent, the futuristic performative activity undeniably contributed to the aesthetics of contemporary theater, here understood as post-1960s, as it was the foundation stone in the development of the Theatre of the Absurd.

However, futuristic performative work has not yet been studied, and is given little relevance.

Based on the analysis of the various manifestos of the futuristic movement, and taking as a starting point the studies of RoseLee Goldberg and Michael Kirby, this paper aims to draw a bridge between the texts, theory, and the performance itself, as a direct application of the ideas expressed in them.

From our point of view, the contact and the relationship with the audience were never the same after this first break of the fourth wall, which forced the viewer to take part in the action. The refusal of the naturalistic representation and the evocation of the physical and mental space of a real conventional narrative allowed one to begin to work much more on allegories or, more radically, on lies. Likewise, the role of the actor was altered, perhaps that of light, sound, set and costume design. The topics addressed also diversified and, for the first time, the text saw its primacy called into question.

In short, we believe that futuristic proposals have left marks that will be tirelessly applied today, and we seek to expose them

- 16761 | Discursive representation of male perpetrators of violence against women in judicial discourse: masculinities in question

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This study aims to investigate the composition of discursive representations of male perpetrators of violence in court decisions. The main objectives of this research are to investigate the discursive representations of male aggressors in appellate court decisions, how these representations are linguistically-discursively elaborated and what are the functions that these representations assume for the argumentative construction of the appellate decisions. We start from the hypothesis that there is no discursive neutrality and that, therefore, the linguistic choices used for the representations of the world are at the service of an objective, an argumentative purpose of the enunciator. This research relies on theoretical and analytical frameworks from Dialectical-Relational Approach (FAIRCLOUGH, 2003; 2004; 2009) and the Historical-Discursive Approach (REISIGL & WODAK, 2009) of Critical Discourse Studies correlating with the general modes of operation of ideology (THOMPSON, 2011). The research to be developed is qualitative and documentary. The data consist of four appellate decisions produced by the Portuguese justice. They will be analyzed in their lexical, phraseological and textual aspects, their ideological and cultural components and the power relations that make up the discursive representation of legal texts. The discursive representations of men and the processes in which they are inserted are intertwined from relations about how our society understands masculinities and naturalizes attitudes of domination and violence practiced by these social actors. Finally, by demarcating the linguistic and ideological components that made up the studied judicial decisions, we emphasize the importance of linguistic perspectives in social practices and, therefore, propose forms of social action that use language in an inclusive way.

- 16762 | The influence of Motivational Climate and Goal Setting on technical performance in youth male volleyball players

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The purpose of this study was to examine the relationship between the motivational climate and goal setting on technical performance in youth male volleyball players from different age groups. The sample included 151 male players aged between 10 and 15 years. The players were examined on the following Technical tests: Reception (reception A, B or outside of the target), Setting (setting to z4), Service (service to z1, z6 and z5) and Spike (spike to z1 and z5). The Psychological variables considered were: the Motivational Climate (task, ego and error orientation) and Goal Setting (task and ego orientation). One-Way ANOVA was used to examine the relationship between age group and technical performance. Post hoc analyses were conducted using Bonferroni tests. Effect sizes were determined using eta-squared values. A Pearson Correlation analysis was conducted to examine the relationship between the psychological variables and the technical performance. The results showed that age was a differentiating factor between the players in the technical tests, but not in the psychological variables. The older players performed better in serving to z1 ($p=0,002$), z5 ($p<0,000$) and z6 ($p=0,004$), receiving to zone A ($p=0,032$), setting to z4 ($p<0,000$), spiking to z5 ($p=0,004$) and z1 ($p<0,000$). The younger players presented a higher number of reception with error ($p=0,003$). The correlation between the Psychological variables and the Technical tests showed no results in this study. Thus, although the athlete's motivational state may influence their posture in training and competition, it doesn't necessarily mean influences in their performance.

Key-words: motivational climate, goal setting, technical performance, youth sport, volleyball

- 16763 | Johann Moritz von Nassau-Siegen's *Kunstammer*: scientific illustration in Dutch Brazil

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In 1637, German Johann Moritz von Nassau-Siegen, employed by the Dutch West India Company, became the Governor of New Holland in Brazil and established a thriving and peculiar colony with religious tolerance, vast incentive towards architecture and the study of the natural sciences. Amongst his many accomplishments, the most significant was the creation of a collection dubbed the *Kunstammer*. This Cabinet of Curiosities is an alluring assortment of artefacts of diverse interests, such as ethnography, geology, botany, zoology and art. The artistic items are the subject for this investigation.

Thus, the proposal is the scrutiny over the 17th century collection of natural history illustrations created under the patronage of Nassau in the territory of northern Brazil. The aim is, not only to locate and identify them, but to make a detailed inventory. Reuniting the codices *Theatrum Rerum Naturalium Brasiliæ*, *Libri Principis* and *Miscellanea Cleyeri*, with the book *Historia Naturalis Brasiliae*; such endeavor has the purpose to make known a myriad of images which are mostly unseen and unheard-of to the public.

This project encompasses the arts and sciences (biology, botany, zoology and ecology). The subject of natural history illustration helps the contemporary scene of the art history corpus with a rich material, vastly overlooked and yet to be studied in depth. Not only it dialogues with conservation efforts in ecology and issues of biodiversity in botany and zoology, but also with the betterment and possibilities proportioned by science communication with ample support from the arts.

Key words: history of art, natural history, natural history illustration

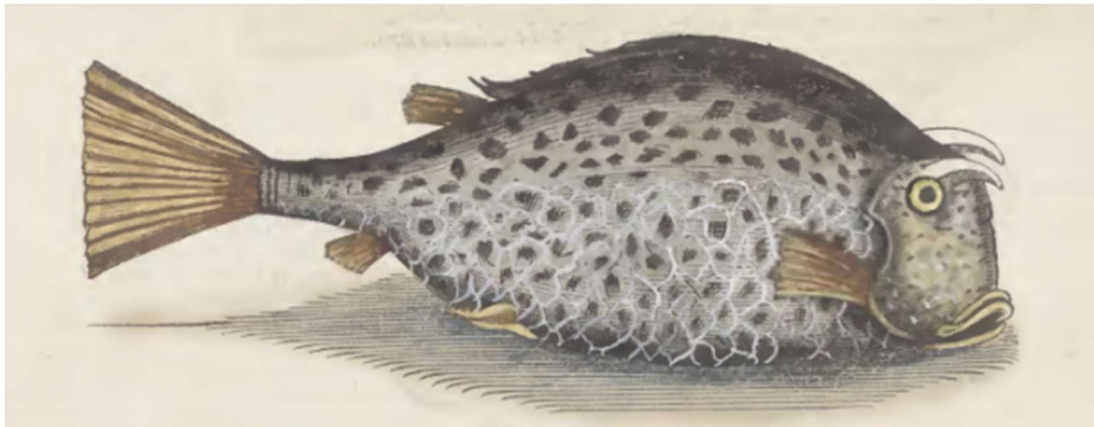


Illustration from the book *Historia Naturalis Brasiliae*.

- **16765 | Association of frailty severity with the risk of postoperative complications in oncologic patients: systematic review and meta-analysis**

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Frailty is a biological syndrome characterized by a reduction of physiological reserves and decreased tolerance to stressful stimulus like a disease or a surgery. The prevalence of frailty increases with age and its incidence among older patients with cancer is especially high.

This work aims to study the association between the severity of frailty and the development of postoperative complications in cancer patients undergoing surgery.

Potential studies were systemically searched through the Pubmed/Medline, Cochrane Library and Academic Google between January and March 2019. All possible definitions of frailty were considered. Quality of the studies was assessed with the Newcastle-Ottawa quality assessment scale and statistical analysis was performed in Revman (Review manager V5.3). The random-effects model was used to calculate the Odds Ratios (OR) and the 95% confidence interval (CI). PRISMA guidelines were followed. We explored the sources of heterogeneity by performing sub analysis.

From a total of 91 423 articles, 19 (7 prospective and 12 retrospective) studies were eligible for the meta-analysis.

Frailty and pre-frailty seems to be a major risk factor for postoperative complications in cancer patients. The risk remained high even after further sub-analyzes were performed. Heterogeneity remained high except in fried scale and in comprehensive geriatric assessment for assessment tools sub-analysis, head and neck, abdominal, gastrointestinal, and urological for types of cancer sub-analysis, prospective for types of studies sub-analysis, europe and asia for location sub-analysis, studies with a sample size less than 1000 and with a follow-up over 1 year.

- 16766 | The Intentionality the Image and the aesthetics of tragic: an empirical study about the reactions to the Portuguese Prison Project Exhibition

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This empirical study, "The Intentionality the Image and tragic aesthetics: philosophical and empirical analyses of the spectacle of the prison" under the coordination of Cândido da Agra, is part of the larger The Portuguese Prison Photo Project. This research aims to understand the reactions at different levels of a sample of individuals during the visit to the exhibition of photographers Luís Barbosa and Peter Schulthess - which took place at the Aljube Museum-Resistance and Freedom. For this purpose, a survey was administered to 232 individuals (n=232) in which the behaviors, emotions, sensations, cognition and attitudes related to imprisonment and punitivity were measured following the visualization of the exhibition. It was found that 57.7% of the sample was female and the average age of the respondents was approximately 38 years. The results suggest that, after the visit to the exhibition, the individuals presented, mainly, high levels of sensations of imprisonment in comparison with men. With regard to the emotions experienced, it was found that, given the exposure, individuals felt high levels of interest, attention, curiosity and sadness, with the replacement of the prison sentence being the one with the highest mean and, on the other hand, with the individuals not agreeing with the reinstatement of the death penalty. Thus, it can be concluded that there is a discrepancy between men and women in most of their sensory and emotional responses, resembling only in general perceptions, which leads to the need to understand what will cause these differences.

- **16767 | Polyoxygenated xanthenes with skin anti-aging potential**

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Xanthenes are heterocyclic polyphenolic compounds that can be found in microorganisms, fungi, lichens, and some higher plants. Structure-activity relationship studies have suggested that xanthenes with vicinal diol groups have promising antioxidant activity. Antioxidants have long been used in the cosmetic industry making the search for new antioxidant agents highly desirable in this field.

In a previous work polyoxygenated xanthenes were hypothesized as promising antioxidants with potential as skin anti-aging agents [1]. Hence, the synthesis of new derivatives was attempted by different routes: Friedel Crafts acylation, Smiles rearrangement, acyl radical cyclizations, among others. Following these studies more compounds were obtained and their antioxidant activity was evaluated by the DPPH assay, with two of the tested compounds showing IC₅₀ values in the same range as the ascorbic acid. Concerning skin-degrading enzymes, three compounds were excellent tyrosinase inhibitors and were weak collagenase inhibitors. Studies of stability in presence of FeCl₃ and CuCl₂, dependence of the pH of their aqueous solutions and their solubility in water and glycerol put in evidence two xanthenes. Lastly, the phototoxicity of the most promising xanthone, 1,2-dihydroxyxanthone, was evaluated in a human keratinocyte cell line and no phototoxicity was observed in the concentration range tested.

[1] H. Cidade, V. Rocha, A. Palmeira, C. Marques, M.E. Tiritan, H. Ferreira, J.S. Lobo, I.F. Almeida, M.E. Sousa, M. Pinto. *Arabian Journal of Chemistry* 2017, doi: <http://dx.doi.org/10.1016/j.arabjc.2017.01.006>.

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- 16768 | Competing cousins: Phylogeography and contact zones of *Podarcis vaucheri* lineages throughout Morocco

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The *Podarcis* genus has already been shown to comprise an immense amount of variation within itself, with more and more species being added to its ranks as more speciation events are identified through molecular approaches; nevertheless, for its African range, only the *P. vaucheri* remains considered. At least two highly differentiated lineages have already been accounted for the species in the region: the "main type" and the "Jebel Sirwah" variant form. However, no comprehensive studies for its Moroccan range have been conducted, and a sound phylogeny remains undone. Intending on clarifying the relationships between the *Podarcis* lizards in Morocco, we analysed mitochondrial and nuclear sequences from samples across its whole Moroccan range, estimating a phylogeny and the divergence times for its most relevant cladogenic events, and further complementing our results with species distribution modelling for present and past conditions. We identified great mitochondrial genetic diversity within *P. vaucheri*, alongside clear phylogeographic patterns that were coherent with both recent and ancient past climatic conditions and events. We also obtained additional support for suggesting the elevation of the "Jebel Sirwah" variant into full species status.

- **16770 | MARCO DE CANAVESES, BETWEEN DOURO AND TÂMEGA: OBSERVATION OF A NETWORK OF CENTRAL PLACES**

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This research's goal is to understand the design and build process in territory apparently fractured and unclear. Here, it's considered that the contemporary territory is the result of an overlap of layers, product of the continuous and shifting relationship between society and the land it inhabits.

Using Geographic Information Systems, a work base was created that combines bibliographic data with discovered traces of settlements, allowing the overlap of different layers of information, compared in various scales. The observations directed efforts to creating a more detailed record of dwelling marks of both the pre-millennium BC settlement and the castrejo settlement. The analysis was focused in Marco de Canaveses, on the relationship system between polarizing locations, both inhabited and symbolic, by tracing circulation, knowledge passing and ways of life. The locations of the castrejo villages suggest a decentralized system, consisting of local consciences, where the neighboring relationships extend in a network to form a global structure, reaching the peninsula's north, center and south.

The results found are relevant to understand the territory's evolution. However, one must always consider that this is a continuous process of evolution and experimentation, between a community and the space it inhabits, shaping it according to their needs and experience, always with the goal of improvement.

This research was developed within a Master Dissertation in Arquitectura entile Marco de Canaveses, Entre o Douro e o Tâmega: observation of a network of central places, FAUP, 2018/2019.

- **16771 | Micropropagation of the species *Prunus dulcis* and *Ceratonia siliqua***

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The aim of this study was to develop in vitro rooting and rooting protocols of an almond tree about 300 years old, from which adult materials (branches) and juvenile materials (seeds) were collected. For carob tree the objective was to develop an efficient micropropagation protocol for selected genotypes, from the establishment and multiplication phases. To carry out this study the following steps were taken: plant material collection, sterilization, in vitro establishment, in vitro multiplication and lastly, tests with growth regulators were performed.

For the plants originated from adult material, aged between 4-8 weeks, two concentrations of growth regulators 0.2 - 0.4 mg L⁻¹ BA (N6-benzyladenine) were applied. The treatment with 0.4 mg L⁻¹ of BA responded with better results in the number of shoots, height and percentage of plants with roots. Seed plants, 4 weeks old, were used at concentrations of 0.5 mg L⁻¹ BA and 0.5 mg L⁻¹ BA + 0.05 mg L⁻¹ IBA (indole-3-butyric acid), but there were not significant differences with these treatments. Root induction tests were also carried out with 5 mg water soluble IBA for 5 days in plants of adult and juvenile material. The results were satisfactory only for plants originating from juvenile tissue, where they reached above 50% of rooting.

In the carob tree, tests were performed with growth regulators in order to obtain high rates of in vitro proliferation and shoot quality. Initially the concentration of 1 mg L⁻¹ BA was used, but there were no satisfactory results, the plants showed symptoms of necrosis. The experiment was performed again but with 0.5 mg L⁻¹ BA and 0.5 mg L⁻¹ of GA3 (gibberellic acid) and the objective of in vitro establishment of carob tree was accomplished.

Key words: Almond tree, Carob tree; micropropagation of woody plants.

- **16772 | The Influence of Mass Media on the Fear of Terrorism: A Qualitative Study**
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Fear of terrorism is currently a very relevant topic under the field of Criminology. This research aimed to deepen the knowledge about this phenomenon to understand how mass media shape insecurity experiences related to terrorism attacks. In the present work, using qualitative methodology, a total of 20 interviews were made through a convenience sampling strategy.

Concerning the fear of terrorism, the scientific literature on the definition of terrorism and its fear has not been unanimous (Dorland, 2007; Laqueur, 2004). So, one of the aims of the present investigation was to address individual narratives about terrorism. Thus, when asked what they understood about fear of terrorism, while a set of respondents report images associated with specific situations such as 9/11, other individuals defined it using religious expressions, specific people related to attacks and objects.

Likewise, the results of this study lead us to suggest that the insecurity reported by the subjects does not end in crime or in the possibility of being victims, since there were several individuals who identified daily situations where insecurity had also expression, so the insecurity felt by these interviewees goes beyond the possibility of victimization. Also, results of this work suggest that there is an impact of the mass media on respondents' perceptions of insecurity in general and on terrorism, in particular. It was found that the images used by the media influence both the feeling of insecurity and security behaviours adopted by individuals to avoid victimization, either by common crime or terrorism.

Moreover, this research gave some insights to the understanding of gender-fear of crime relationship, as it revealed that for women, the fear of crime is manifested in the concrete fear of being victim of a sexual assault, thus meeting the widespread theory "Shadow of the sexual assault" (Ferraro, 1996).

Keywords: feelings of insecurity; fear of crime; terrorism; fear of terrorism; mass

- 16773 | The properties of Diocese of Coimbra between the royal enquiries of 1284 and the Livro Preto (XI-XIII centuries)

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This paper scientific purpose is to compare the veracity of the information shared by two different historical sources, one being the royal enquiries of 1284 and the other the "Livro Preto" of the diocese of Coimbra. This idea brings some innovative thoughts into an historiographical area not often explored, since it aims to compare the properties recognized in the aforementioned sources.

Both were produced in the XIII century, the royal enquiries ordered by Dinis of Portugal and the "Livro Preto" by the prelate of Coimbra. Although, they don't share the same documental typology: the enquiries are essentially a compilation of testimonies gathered by inquirers, latter composed in the king's chancellery, and the second source compiles several documents, essentially donations to diocese of Coimbra. As to the chronology framework they both reassemble a period earlier than the XIII century, but the criteria is based in the documents that were compiled in "Livro Preto". On the other end, the space background was defined by the enquiry of 1284 that addressed the municipalities of Oliveira de Azeméis, Vale de Cambra, Sever do Vouga and Albergaria-a-Velha.

The methodology will reflect the intention to compare the assets of the dioceses of Coimbra in each source. The most important information is the quantity and typology of the possessions as well as the form of acquisition. One must take into account that in the enquiry those aspects are frequently well characterized, but the same can't be said for the "Livro Preto", which is also characterized by the ambiguity on its geography and administrative details. Related to this, some medieval toponymy will be focussed and some images and charts will support this paper. One early conclusion showcases that this diocese lost patrimonial expressivity in the selected space throughout the centuries and we aim to analyze the issues around it.

Properties of Diocese of Coimbra in the municipalities of Oliveira de Azemeis, Vale de Cambra, Albergaria-a-Velha and Sever do Vouga territory

Tabela 1- Património da Sé de Coimbra no território dos actuais concelhos de Oliveira de Azeméis, Vale de Cambra, Albergaria-a-Velha e Sever do Vouga.

Localização		Livro Preto			Inquirição de 1284	
Concelho	Topónimo e freguesia	Data do documento	Documento (nº)	Bens identificados ("abstracto"/material)	Bens identificados	Página
Oliveira de Azeméis	Palmar		38.30.222.480 e 564	Herdade (material)		
	Figueiredo	1115	107			
	Quintã		69.143.321	Herdade (material)		
Vale de Cambra	Arelas	1133	563	1/6 da <u>Villa?</u>		
	Santiago Codal	1133	315	Igreja		
	Santa Cruz	1057	88	1/3 da <u>Villa</u>		
	Castelões	1019	121	Herdade (abstracta)		
	Decide		54.264.566	Herdade (material)		
	Loure	1108	183	Herdade (material)		
Albergaria-a-Velha	<u>Telhado</u>	1110	222	Herdade (abstracta)		
	Curval	1109	412	Herdade (material)		
	Igreja				Herdade (material)	p. 75
	Campo				Herdade (material)	p. 75
	Fráguas				Herdade (material)	p. 75
	<u>Casaldelo</u>				Herdade (material)	p. 75
	Carvalhal				Herdade (material)	p. 75
	<u>Rostorenga</u>				1 Casal	
Sever do Vouga	Paredes	1046	141	Herdade (abstracta)		
	Paradeia	1046	141	Herdade (abstracta)		
	Nogueira	1101	483	Herdade (abstracta)	2 casais	pp. 59-60
	Rocas	?	359	"Casa" (material)		
	Paço	1057	88	1/3 da <u>Villa</u>		
	Barreiros	1057	88	1/3 da <u>Villa</u>		
	Pezigueiro	1019	121	Herdade (abstracta)		

- **16778 | SPACE APPROPRIATION AND IDENTITY**

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*"(...) school is the first public equipment with which the pupil contacts as a user, right there it takes place an initial educational experience within the scope of respect for a collective good, an object with both co-habitation and usage rules that should endure during social life. (...) the school building (...) represents an initiatory pole for citizenship and personal development."*¹

Inhabiting the school shapes its identity, memory and value. As agents of socialization and growth, schools embody a space where the teaching-learning process should be enriched by spatial features.

Regardless the user type, believing that architecture *matters* confirms that both human and social dimensions lay its essence. By nature, the school environment has a determinative role in the personal development of each individual as the most persisting experience of life in community.

When connecting with school on a daily basis, each person appropriates space on a particular form. Because of its human dimension, his behavior is key to simultaneously complemente and complete school buildings.

This abstract, embedded in the investigation project *Escolas: Complexidade e Interpretação*, based on CEAU (FAUP), seeks to understand the architectural transformation of school buildings in Portugal, focusing on the interactions between users and spaces. The project aims at deepening the space appropriation process, and its interferences with the users needs. In these terms, the present study highlights the dialectic's significance between architecture and spacial identity.

1 - BARATA, João Pedro Martins - Enquadramento para a realidade escolar. In PARQUE ESCOLAR, E.P.E. - Manual de projecto para a acessibilidade nas escolas.(p.7).

- 16779 | Asteroseismology with ESA's PLATO mission: Testing modelling requirements for subgiant stars

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Photometric observations made by space missions such as the NASA Kepler space telescope have enabled the successful detection of oscillations in thousands of solar-type stars, and the future ESA PLATO (PLANetary Transits and Oscillations of stars) mission is intended to follow the same path by investigating seismic activity based on a multi-year observation, enabling a precise characterization of solar-type stars. Considering this, there is a need to establish the minimum stellar model grid required to effectively fit the mixed modes of subgiant stars. However, the nature of mixed modes and their fast variation renders the model interpolation process less precise. To mitigate this problem, one needs a considerably dense grid of stellar models, which is both computationally expensive and costly in terms of time. In this poster, we adopt six simulated stars and a dense stellar model grid from the *hares-and-hounds* exercise of the PLATO work package WP124, and establish the lowest subgiant grid density that can still reproduce the "true" stellar parameters of the *hares* (mass, radius, and age) when mixed modes are neglected. To explore this, we adopt two approaches: (i) reduce the number of evolutionary tracks in the grid, (ii) reduce the number of models along each evolutionary track. Our findings show that one needs a minimum of 500 evolutionary tracks with one-eighth of the original number of models uniformly distributed throughout each evolutionary track, so as to reproduce stellar parameters within the acceptable PLATO accuracy requirements.

- **16785 | Cannabidiol modulates basal and depolarized-evoked release of GABA and Glutamate from hippocampal nerve terminals of immature and adult rats**

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The psychotropic effects of *Cannabis sativa* are mostly due to tetrahydrocannabinol (Δ^9 -THC). Cannabidiol (CBD), another naturally occurring phytocannabinoid lacking the psychotropic effects of Δ^9 -THC, has been recently approved for the treatment of drug-resistant paediatric epilepsy. Notwithstanding this, its antiepileptic mechanism is not fully elucidated. In this study, we investigated the effects of CBD on synchronous GABA and glutamate (Glu) release from isolated hippocampal nerve terminals of immature and adult rats. Results showed no differences in the release of $[^3\text{H}]\text{GABA}$ and $[^{14}\text{C}]\text{Glu}$ from hippocampal nerve terminals of immature and adult rats depolarized by KCl (15 mM). Replacement of Na^+ by NMDG $^+$ (128 mM) increased KCl-induced $[^3\text{H}]\text{GABA}$ content in the superfusate, both in immature and adult rats, but the increase in $[^{14}\text{C}]\text{Glu}$ release was only observed in adult animals. These results suggest a major involvement of Na^+ -sensitive Ca^{2+} -insensitive high-affinity amino acid transporters on $[^3\text{H}]\text{GABA}$ and $[^{14}\text{C}]\text{Glu}$ outflow following depolarization of hippocampal nerve terminals. CBD (10-30 μM) increased the release of $[^3\text{H}]\text{GABA}$ and $[^{14}\text{C}]\text{Glu}$ under resting conditions, but it significantly decreased the outflow of the two amino-acids from hippocampal terminals depolarized by high KCl. The influence of CBD on $[^3\text{H}]\text{GABA}$ release was more evident in immature compared to adult rats and it was also more notorious in relation to $[^{14}\text{C}]\text{Glu}$ outflow. In conclusion, CBD differentially affects the resting and depolarization-evoked $[^3\text{H}]\text{GABA}$ and $[^{14}\text{C}]\text{Glu}$ release from hippocampal nerve terminals. CBD affects more potently the release of $[^3\text{H}]\text{GABA}$ in immature rats, which might contribute to its anti-epileptic efficacy in the paediatric patients.

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- **16789 | AUTHORIAL CHARACTER AS LINE OF DISCIPLINARY SYSTEMATIZATION IN SCHOOL BUILDINGS INTERVENTION**

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The pragmatism that imposes itself in the accomplishment of a public building network results, frequently, from a strategic uniformization. This condition, by itself, gains disciplinary character by demanding the creation of design tools that interfere in the resulting architectonic expression. In the case of the Program for the modernization of secondary schools (PMEES), this dynamic represented a challenge, given the exigency of reorganization of pre-existing school buildings, in most cases determined by specific typologies.

In fact, the legacy of Portuguese school architecture rests in the recurrent use of examples based in various typologies which, until recently, had only been through minor alterations. The group of demands formalized in the PMEES included the increment of built area and the alteration of hierarchic relationships between spaces, besides a large introduction of new infrastructures, making some of these goals of hard compatibilization with the identity of the original buildings. Furthermore, in this context, the options and solutions, now materialized by the authors in the rehabilitation process, in particular the systematizations to which they resorted in different buildings, opens to the possibility of a recognition of a new character of identity in the schools that were intervened.

This research inserts itself in the scope of the project Schools: Complexity and Interpretation, coordinated by Doctor André Santos. It stems from the understanding that the observation of possible disciplinary relationships between the authorial character resulting in the interventions and the character of identity of the original buildings is fundamental to the production of knowledge about the schools in the PMEES. The importance of this study resides in the relevance of schools to the communities in which they are inserted, and their indispensable character as part of a citizens experience of Architecture in the social scope as in an individual one.

- 16791 | The Impact of size classification in the crushing performance of a Roll Crusher

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The main objective of this project is to study the impact of a size classification in a secondary comminution stage. A laboratory Roll Crusher was used, and the comminution product was size-analysed to obtain the respective particle size distribution.

The roll crusher consists in two horizontal and parallel placed spinning rollers/cylinders, with reverse rotation, that acts on the particles while they pass between them. The particle size distribution of the generated product are affected by the distance corresponding to the space between both cylinders.

During the comminution circuit, size classification stages can be applied for different purposes. In this case, size classification of the roll crusher feed will be applied to remove fine particles, avoiding the production of ultrafine particles. Size classification was applied using a sieve with defined dimensions.

The particle size distribution of each fragmentation product was obtained using a vibratory sieve shaker, applying the so-called Tyler mesh series.

The studied samples were split in several subsamples using a Jones riffle splitter. The process was initiated by doing the crushing of a subsample without a previous size classification. Posteriorly, the other subsamples were crushed after previous size classification at cut-sizes 0.105, 0.212, 0.850 and 1.700 mm to compare its effect on the grinding product. Feed material and crushed products were size classified to obtain the respective particle size distributions, histograms and cumulative representations. A reduction ratio of about 4:1 was achieved. It was validated that previous size classification should be applied when the percentage of undersize is above 15%.

- 16795 | Olive pomace paste: nutritional characterization and development of a topping

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Over the last years, there has been an increase in olive oil production worldwide. Along with the production of olive oil, large quantities of by-products are generated, of which olive pomace stands out [1]. Currently, the olive mills are separating the crushed olive kernel from the pomace. This process allows to obtain pomace without the kernel - the olive pomace paste (OPP).

This study aimed to perform the nutritional analysis of the OPP and to develop a topping based on its nutritional/technological potential, regarding three key-factors: sustainability, health and convenience.

OPP was obtained from an olive mill in Trás-os-Montes (Portugal). For nutritional analysis, the moisture, total protein and fat, ash and carbohydrates were determined [2]. The fatty acid profile was analysed by GC-FID [3]. For the topping development, six formulas were tested using different percentages of water and food improvement agents (FIA) (xanthan gum, guar gum, rice starch, lupine-based flour and agar agar). One of the formulas was developed without FIA addition.

The nutritional analysis showed that OPP has 2.1% of protein and 3.8% of total fat. Ash and total carbohydrate contents were 1.6 and 28.6%, respectively (in fresh weight). The OPP moisture was 64%. The major fatty acid was oleic acid (75.8%), followed by palmitic (11.9%) and linoleic acids (7.7%).

The formula developed with the lupine-based flour presented the best properties regarding homogeneousness, fluidity and brightness. Also, phases separation was not observed after 24 hours of processing. These results show that the combination of OPP with lupine-based flour can be used to develop a food product with the technological characteristics of a topping.

[1] Nunes et al., *Innov Food Sci Emerg* 2016; 35: 139-148.

[2] AOAC Official Methods of Analysis. George W. Latimer, Jr. (Ed.), Gaithersburg, AOAC International, 2012.

[3] Commission Regulation (EC) No 796/2002. Off. J. Eur. Union. 2002 8-28.

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- **16797 | Molecular and histopathological features of tropical endomyocardial fibrosis**

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Tropical endomyocardial fibrosis is a neglected restrictive cardiac disease that affects approximately 10 million people worldwide, especially children and adolescents of certain rural populations in low-income countries. This condition is characterized by increased deposition of fibrous tissue in the endomyocardium and is currently one of the most mysterious and poorly understood cardiovascular diseases (Mocumbi et al., 2019, Curr Cardiol Rep 21:148). This study was designed to compare the molecular and histopathological features of surgical heart samples from EMF Mozambican patients and age-matched autopsy controls. Besides thickening of the endocardium, histology shows moderate perivascular mononuclear inflammatory infiltrates. Immunoreactivity against vimentin (fibroblasts) and α -smooth muscle actin is affected in the EMF group. The myocardium of EMF patients exhibit increased immunoreactivity against inflammatory cell markers (CD206, CD11b and CD4), as well as for ATP-sensitive ionotropic P2X4 (cardiomyocyte pattern) and P2X7 (fibroblast-like cells) purinoceptors. A reduction in the number of Cx43 protein clusters at gap junctions (intercalated discs) was accompanied by redistribution of this protein throughout the plasma membrane. This situation is favorable to the formation of Cx43-containing hemichannels permeable to many different molecules, including ATP. Downregulation and/or redistribution of Cx43 may lead to gap junctional communication failure between cardiomyocytes and cardiac fibroblasts. This together with the putative increase in extracellular ATP accumulation may signal via P2 purinoceptors to promote migration, proliferation and differentiation of cardiac fibroblasts into activated myofibroblasts and, subsequent collagen production and extracellular matrix deposition leading to cardiac stiffness, electrical conductance abnormalities and hemodynamic dysfunction, which are characteristic features of EMF.

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- 16799 | *Patella* spp.: Predicting impacts of climate change on species distribution

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Limpets (*Patella* spp.) are marine gastropods that inhabit rocky shores along the coast of Europe, the Mediterranean, Macaronesia and the Northwest coast of Africa. Being considered key species, limpets have an important role regulating algal assemblages in coastal communities through grazing. In Portugal, *P. vulgata*, *P. depressa*, *P. ulyssiponensis* and *P. rustica* are the most common species of *Patella*. The goal of this work is to build mechanistic models of the current and future distribution of *Patella* species along the coastal line of Portugal and Europe according to the worst predicted climate change scenario (e.g: 2014's IPCC report projected global temperature increases of 3,7°C, in average, by to 2100). Specimens of *P. vulgata*; *P. depressa* and *P. ulyssiponensis* were collected on a rocky shore in northern Portugal and immediately transported in a cold box to the laboratory. In the laboratory the individuals were kept acclimatised for 7 days at sea temperature inside aerated seawater tanks. After this period, the individuals were transferred to a new system and grouped in pairs, each representing a temperature (6°C, 8°C, 12°C, 16°C, 20°C, 24°C and 28°C), for two weeks. Throughout this acclimation period, the temperature in each tank was gradually increased/decreased by 1°C from the initial temperature to the target temperature. For each species, respiration rates will be assessed, based on oxygen consumption at different temperatures. Preliminary results indicate that *P. ulyssiponensis* oxygen consumption ($\mu\text{mol h}^{-1} \text{g}^{-1}$) increases exponentially ($y = 0,144e^{0,1588x}$ $n = 41$ $R^2 = 0,3246$) with temperature (°C). These data will be integrated in mechanistic models that will be compared with standard correlative approaches using algorithms such as GLM, GAM software MaxEnt and species occurrences data from online databases such as Ocean Biogeographic Information System (OBIS) and Global Biodiversity Information Facility (GBIF).

- **16800 | Shadowspace: project for a funeral home in Porto**

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Death is an unavoidable event in life that needs a proper space for its celebration. Currently, the funeral home is the architectural approach to this need, providing a set of spaces for increasingly personal and symbolically expressive rituals.

The present dissertation is the result of an investigation about the conception of a funeral home for the city of Porto. It stemmed from a relationship between two concepts: the mental construction of a space dedicated to celebrating the ritual of death, and the designed construction of a building capable of accommodating a program with very sensitive requirements, idealized as a singular concept which lives in the limbo between a crematorium, a cemetery and farewell spaces. Then, the proposal consists in the elaboration of a funeral home that opens to the landscape: a meeting place between the living and the dead.

The various ways of dealing with the finality of life have left marks in the conception of the spaces of death, but in general, these have always been linked to religious institutions, a status which has recently been questioned by the increasing tendency of secularization of crematoriums and funeral homes. Nowadays, they present themselves as references of a space of death, which are associated with the emotional values and different identities of each society, rather than their religious values. Thus, the architect must reflect on these significant tensions and transformations over the last decades, designing strategies that aim to define an appropriate space according to the understanding of contemporary needs.

The approach to the concepts of place and to the programmatic and symbolic construction is aimed at the search for translation of the approached concepts into architectural design, in an inseparable relationship between theory and practice. The architectural project is thus a way to graphically represent the issues thrown in the dissertation.

- **16804 | Deep-sea pharmacies: Exploring deep-sea Actinobacteria for the production of novel natural products with pharmaceutical applications**

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Antibiotic resistance has become a big threat to global health as the treatment of a growing number of infections is becoming a serious problem. The misuse of antibiotics is one of the main causes leading to a decrease in their efficacy against pathogenic bacteria. On the other hand, cancer is responsible for the death of millions of people every year and resistance to available therapies is of big concern. Even though the marine environment is poorly explored, it is well established that some marine Actinobacteria can produce compounds with antimicrobial and anticancer activity. This work aimed to study the biodiversity of cultivable Actinobacteria associated with the underexplored deep-sea environment and investigate the antimicrobial and anticancer potential of the isolated strains. Nine samples collected in the Madeira archipelago, comprising corals, sediments and sponges, were collected at a depth of approximately 1000 meters using the submarine Lula1000. The sponges and corals were rinsed with sterile sea water and macerated with a mortar. Fragments of the samples were pre-treated by incubation at 57 °C for 15 min and dilutions of the fragments were made using sterile sea water. These were then plated in three selective media (M1, M4 and NPS) supplemented with the antibiotics (nystatin, cycloheximide and nalidixic acid) and incubated at room temperature for a period up to 6 months. Up to the moment, 91 isolates have been obtained. From these, eight isolates were already identified, revealing five actinobacterial strains affiliated with the genera *Brevibacterium* and *Microbacterium*. The next steps of this work will be to complete the phylogenetic identification of all isolates and screen their bioactive potential.

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- **16808 | The Barns of the Valley. A new condition for the landscape and territory of Chão da Ribeira.**

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The present dissertation tries to understand the interventions in the barns in Vale do Chão da Ribeira, located in the parish of Seixal in the Island of Madeira. The interest arose from the idea of making an intervention in one of the barns that is still in its original state. So, the case study represents part of an intervention that may be carried out in the landscape.

It became evident that the reconstructed barns are not following the original characteristics of the landscape at an architectural and environmental level due to divergences of scale both programmatic and constructive. Thereby the Municipal Territorial Plan served as basis for this research, in order to understand the structural landscape features. Since Vale do Chão da Ribeira is considered a Humanized Landscape to be protected by the Municipal Master Plan, the main aim is to find a sustainable development strategy of the territory through the recognition and use of its use and values.

Therefore, it is proposed a reflection on how to (re)build in Chão da Ribeira preserving the patrimony associated to the agriculture and the practice of outdoor activities that are realized in the hills that embrace the Valley.

Keywords: territory, landscape, patrimony, architecture, memory, scale, intervention.

- **16810 | The role of Urocortin-2 in Heart Failure with Preserved Ejection Fraction**

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Introduction: Heart failure with preserved ejection fraction (HFpEF) is frequently accompanied by the metabolic syndrome and kidney disease. Because current treatment options of HFpEF are limited, evaluation of therapies in experimental models of HFpEF with the metabolic syndrome is needed. Urocortin 2 (Ucn2) is a cardioprotective peptide belonging to the corticotrophin-releasing hormone (CRH) family. In animal models and humans with HF with reduced ejection fraction, Ucn2 has been shown to exert favorable effects on left ventricle (LV) function, as well as on neurohumoral and renal parameters.

Aims: In this work we studied the role of the Ucn2/CRHR2 system in the pathophysiology of HFpEF, and we evaluated the efficacy of Ucn2 as a novel therapeutic strategy in this disease.

Methods: Either Ucn2 (15 µg/Kg/day, subcutaneously) or vehicle were administered to lean and obese ZSF1 rats aged 18 to 30 weeks (6-7 animals/group). Animals were then tested for oxygen consumption under maximum effort (VO₂max), oral glucose tolerance and insulin resistance, and samples were collected after 12 weeks of treatment. Temporal evolution of cardiac (dys)function was assessed by echocardiography.

Results: mRNA expression of Ucn2 and CRHR2 is decreased in LV from ZSF1 obese rats compared to ZSF1 lean, and it is correlated to LV structure and diastolic function. Although Ucn-2 chronic treatment did not attenuate the body weight gain and the impaired exercise capacity in experimental HFpEF, Ucn-2 treatment improved glucose tolerance in ZSF1 obese rats. By echocardiography, we demonstrated that there are no differences in the ejection fraction between groups and that the Ucn-2 therapy attenuated LV mass in ZSF1-Obese animals compared to non-treated group. No differences were observed in E/E'.

Conclusion: This study suggests that chronic administration of Ucn2 could be beneficial in patients with HFpEF, attenuating LV remodelling and improving glucose tolerance.

- 16812 | BIOLOGICAL CHARACTERIZATION OF HEMOSTATIC AGENTS – IN VITRO STUDIES

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Hemorrhage is a leading cause of preventable mortality and recognition of this has led to progressive advances in hemostasis control and in a growth of clinically available topical hemostatic agents, which are an important therapeutic option for the management of bleeding, in which physiological processes are inefficient.

However, because these hemostatic products do not undergo a thorough regulatory evaluation as do other biomaterials or drugs, there is currently no systematic approach for the acquisition and documentation of use of these agents in human clinical settings. As such, this work aims to address the biological characterization of clinically available gelatin-based hemostatic agents, specifically Hemospon, Clinix, Roeko and Octocolagen, through *in vitro* studies with various human cell lines.

Fibroblastic cells and osteoblastic-like cells were cultured for 24 hours in growth medium after which leachables from attained hemostatic agents, at 50%, 25% and 12,5% concentration, were added. Cells without leachables were grown as a control. The cell cultures were then evaluated on cellular morphology, cell proliferation, cell viability, metabolic activity and alkaline phosphatase activity, as well as histochemistry, specifically alkaline phosphatase staining and collagen content, at different timepoints.

Generally speaking, the results didn't show any significant induced cytotoxicity in the cells tested, exhibiting in fact similar results to the control; however, there were some differences in the assays performed that could demonstrate that while the sponges' may not affect cell proliferation, they could have some effect on their viability. Aside from this, it could also be detected that different sponges had better results for each cell type.

- **16820 | *Opuntia ficus-indica* - red variety: comparative analysis between cladodes and fruit**

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Opuntia ficus-indica (L.) Miller is commonly known in Portugal as figueira-da-índia. Although wild plants could be found, these gained expression in our country as a crop, especially in the south of Portugal [1]. For that, the study of the plant, specifically its stems, cladodes, and fruits, becomes of utmost importance to support their consumption *in natura* or to develop other applications in food industry.

From this perspective, this study aimed to evaluate the nutritional composition and antioxidants content of cladodes and fruits of the red variety. The samples were produced in Torres Novas (Portugal).

The nutritional profile of cladodes and fruits was determined by AOAC methods [2] and the sugar composition by HPLC-ELSD [3]. For antioxidant compounds evaluation, the extraction was performed using different solvents: 100% water, water/ethanol (1:1) and 100% ethanol. The total phenolics and flavonoids contents, DPPH, and FRAP of the sample extracts were evaluated by spectrophotometric methods [4].

According to table 1, the nutritional profile of the fruit stands out in relation to the cladodes. However, both have low-fat contents and interesting amounts of protein. Cactus pear has a slightly higher total fiber content and carbohydrates. Fructose and glucose were the main sugars identified in the fruit whereas, in the cladodes, sucrose was also present. The cladodes stand out for their value in total minerals. Regarding antioxidant activity, the water/ethanol mixture (1:1) allowed a more efficient extraction in both samples.

Given the chemical similarities between cladodes and fruits of the red variety, the increase of this production and their dissemination, promotion, and valorization is justified. Nevertheless, different applications improve the potential of these products to be part of a healthy food pattern, their contribution to sustainable access to food, and promotion of food diversity.

Table 1. Nutritional composition of red variety of the cactus pear and cladodes

Sample	Moisture (%)	Fat*	Protein*	Ashes*	Dietary Fibre*	Carbohydrates*
Red Cactus pear	80.53 ± 1.22	1.50 ± 0.09	6.40 ± 0.41	3.86 ± 0.06	27.27 ± 0.36	60.90 ± 0.16
Red Cladodes	92.05 ± 0.11	1.73 ± 0.33	3.48 ± 0.36	20.70 ± 0.04	22.95 ± 0.23	51.18 ± 0.57

* Results presented as g/100 g dw

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- **16821 | University and Polytechnic Institut: two experiences of project design and planning process in the CEFA/UP.**

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This abstract is about a dissertation which relates to the general theme of the architecture of university complexes. Its research theme are two case studies: the Aveiro University (UA, Aveiro, Portugal), and the Viseu Superior School of Technology and Management (ESTGV, Viseu, Portugal) - a Polytechnic Institute of Viseu (IPV) member. We began by studying the municipalities of Aveiro (1959) and Viseu (1123), in the Central and North-Central regions of Portugal, and then recognize the characteristics of these universities. It is also important to consider the specificity that these sets of buildings were both elaborated at the Study Center of the Faculty of Architecture of the University of Porto (CEFA/UP). However, coordinators and teams are distinct, as well the situations involving their project design and planning processes are diverse. The details about the parallel and the same singular paths that the orders of these projects take are precisely one of the central objectives of this investigation. At the same time, through interviews and testimonials, it was also possible to record narratives of some of the architects involved, identify architectural references and know more about the historical moment they experienced. From this information, we close the investigation with a comparative analysis between both sets of buildings and their compositions, as well as between each of them and their possible architectural references. Thus, in this investigation it was possible to demonstrate the contrasts and characteristics of these case studies that, in the same category - of buildings for higher education - and with the same organization model, are solutions for a university and a polytechnic institute.

- **16823 | Of a contemporary sacred art in the Spanish agrarian colonization**

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A socio-economic plan could not be relegated to a set of technical applications. Agricultural policies in Spain had as last phase the occupation of the land by building new towns to farmers or settlers.

The ideal of return to country lifestyle in contemporary era was reached by the practice of concentrating urban spaces classified in: private (settler housing) and community (Union Brotherhood and churches). The feeling of community was created by the architecture and its care was protected by the spirituality of their churches and chapels. Since the Concordat with the Holy See (1953), the churches have been ordered under the following principle of the community of settlers: a coexistence reinforced by the visual arrangement of the plastic works integrated in the religious architecture.

Everything vibrated in harmony. The aesthetics of the contemporary art showed its capacity to adapt to the needs of the world of an isolated agrarian community thanks to the involvement of Sacred Art Workshops and avant-garde artists who decided to share their sensibility in these rural societies. In Spain, during in the 1950s and 1960s, seven workshops supplied National Colonization Institute' architects with ideas and models, lasting up to the 1970s. Among the seven known workshops are Ars Sacra and Gremio 62. In addition to artists well-known linked to international and national art groups such as El Paso. Some names of this large list are Manuel Rivera, Antonio Rodríguez Valdivieso, José Luis Sánchez Fernández

In the inner of the around 300 spanish agrarian churches, there are unknown masterpieces that complemented the architectural and urbanistic designs. Among the most innovative architects is remarkable José Luis Fernández del Amo Moreno who joined artists and craftsmen with the aim of expressing a total art, similar to the Bauhaus criterias but quite far away of establishing a fixed principle.

Key words: Spain; Agrarian Policies; Sacred Art; Fernández del Amo; Avant-garde.

- **16825 | Oral Disease Prevention Strategies in Peritoneal Dialysis Patients**

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Introduction: The incidence of Chronic kidney disease (CKD) continues to rise worldwide and it's a public problem. These patients have been reported some oral symptoms including gingivitis, dry mouth, ammonia-like odour resulting from a high urea content, mucosal lesions, tooth mobility, malocclusion, and an increased risk of dental erosion because of frequent regurgitation. In severe renal failure, uremic stomatitis may be present.

Aim: To promotional strategies for oral health prevention in CKD patients undergoing peritoneal dialysis.

Materials and methods: A review of literature on oral health of CKD patients and the construction of a flyer by a multidisciplinary team of dentists and nephrologists with an overview of the major concerns about the oral health in CKD patients and the major preventive strategies for these patients.

Results: The edition of an educational flyer about the major concerns and preventive strategies to maintain and promote oral health in CKD patients (figure 1). The flyer was distributed to patients attending the outpatient clinic of the Nephrology Department of Centro Hospitalar de S. João.

Conclusion: With the annual increase in the incidence of end-stage renal disease, it is necessary to make dialysis patients, their nephrologists and their dentists aware of the need for primary dental prevention. The distribution of this educational flyer was a first step on the increase of awareness of the importance of the oral health for the general health of CKD patients.

KEYWORDS:

oral health; renal insufficiency; renal replacement therapy; Chronic kidney disease (CKD)

- **16827 | School climate, LGBTI+ youth and community factors**

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This presentation intends to share the preliminary results of a research held within the context of a masters on Education Sciences at Porto University. The data to be presented is the result of a statistical analysis of a national survey on school climate aimed at lesbian, gay, bisexual, trans, intersex and questioning youth (LGBTI+) aged between 14 and 20 years old, conducted during the Summer of 2017 and referring to the experiences of the 2016-2017 school year in Portuguese territory. The survey was originally designed by GLSEN - Gay, Lesbian and Straight Education Network, and then translated and adapted to the national context by a team of researchers, with the coordination of project leader ILGA Portugal, a Portuguese LGBTI NGO. The survey explored issues such as negative comments caused by prejudice on grounds of sexual orientation, gender identity or gender expression, school safety, inclusion of LGBTI resources in school curricula or resources, support of school staff, sense of belonging, academic performance and aspirations, as well as a number of other school climate related experiences. A first report, released in 2018 by ILGA Portugal, allowed to grasp the overall national situation of LGBTI+ youth and served mainly as an advocacy tool. The current research intends to look at the data through a secondary analysis, focusing on the relation between LGBTI+ youth's experiences and the community level, examining factors such as the school location (district, region, rural or urban setting) as well as its dimension, and its impact on the individual level experiences and school climate. The main objectives of this research are, on one hand, to map the national territory according to the experiences of LGBTI+ youth, to identify possible links between community level factors and individual experiences, and measure the role of the community level factors in the dissemination and efficiency of national LGBTI+ inclusion education policies.

- **16829 | New MOF-based materials for the removal/detection of heavy metal ions in aqueous solution**

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Metal-organic frameworks (MOFs) are materials consisting on metal clusters coordinated with organic linkers to form a crystalline 3D network with high thermal and chemical stability, as well as high surface area and porosity, making these materials especially attractive in numerous applications, such as catalysis, adsorption, chemical sensing, or as a solid support for the preparation of functional materials. One of the more recent trends is the incorporation of polyoxometalates (POMs) or other species in MOFs for the preparation of new materials with enhanced properties [1]. Lanthanide-MOF composite materials are one of these new materials that gained attention, mainly due to their use in luminescent chemical sensing [2] by the combination of the lanthanide's luminescence properties with the MOF's robustness, making this type of material remarkable for the detection of analytes in solution [3].

This work describes the preparation and characterization of new materials based on MOFs or POM@MOFs, followed by its application in the removal and detection of copper(II) and cadmium(II) in aqueous solution. The MOFs were synthesized by solvothermal methods while POM@MOFs composite materials were prepared by direct impregnation of a decatungstoeuropate into the MOFs. Characterization was performed by various techniques, such as FTIR, XRD, SEM, N₂ adsorption and photoluminescence studies. The prepared materials have shown promising results in the removal and detection of heavy metal ions in aqueous solution.

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- 16830 | The Effect of Resin and Ball Size on the Throwing Velocity in Handball

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The International Handball Federation announced the intention of prohibiting the use of resin in handball, addressing the reluctance of many administrators of indoor facilities to its usage. Much of the debate and controversy is about how the resin prohibition will affect players' shooting skills, mainly the throwing speed and tricky shots from narrow shooting-angles, such as the spin shots. As resin facilitates ball manipulation and shooting mastery, a lot of effort has been placed in finding a technical solution for the problem. Therefore, the International Handball Federation approved new technical requirements regarding the ball's size and characteristics according to players' age category, where the ball standard sizes (1, 2 and 3) without resin were downsized (smaller and lighter). Both official resin-free balls 2 (women) and 3 (men) were 2.5 cm (on average) downsized.

This study attempts to exploit the effect of resin and ball size on ball throwing velocity. 10 male players and 8 female players, both from the National Second division, participated in this study. Each player participated in two sessions (one using resin, and another resin-free) and performed 15 randomised 7-metre throws with each ball size. Male players performed the throws with ball sizes 2 and 3 and female players performed it with sizes 1 and 2.

Our preliminary results with the official sized balls show that, with the use of resin, both male and female players shoot 9% faster. The results also suggest that shooting with the ball sizes 1 and 2 (for women and men, respectively) without resin is similar to shooting the official ball sizes with resin, as the hypothesis that shooting velocities in both conditions are equal, was not rejected ($p > 0.05$). Therefore, if resin is to be banned from handball, a more significant reduction in the ball sizes (than the already approved) should follow this change, if we want to preserve current shooting velocities.

Ball speed values

		Ball Speed (km/h)					
		Resin-free			Resin		
Ball	Size	1	2	3	1	2	3
	Circumference (cm)	51	55	59	51	55	59
	Weight (g)	310	350	450	310	350	450
Male players (mean±SD)		-	87.4±4.8	79.1±4.9	-	92.1±3.8	86.1±5.1
Female players (mean±SD)		67.4±4.3	62.7±4.1	-	71.3±6.1	68.5±4.9	-

- **16833 | Optimizing the characteristics of a nasal stick for early detection of dementia and Alzheimer's disease**

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Smell impairment is an early, frequent and sensitive marker of the preclinical phase of neurodegenerative disorders, such as dementia and Alzheimer's disease. Therefore, its detection may afford to identify subjects at increased risk of these disorders at a very early stage, and may be useful in identifying people at increased risk of cognitive decline more broadly, thus allowing early therapeutic interventions.

In recent years, some smell tests have been developed to assess the olfactory function in clinical practice. The present work is part of a broad project that we have been carrying out in order to develop a novel system - in the form of a nasal stick - suitable for the identification and quantification of odors in clinical practice.

In a previous work, we studied different stick compositions, aiming to evaluate various types and concentrations of waxes, as well as different modulators of consistency. After selecting the most appropriate formulation, a preliminary stability test was carried out using nbutanol (suitable for assessing odor threshold) and vanillin and menthol (both suitable for assessing odor identification) as odorous compounds. All sticks preserved the initial odor characteristics for 2 weeks and some of them maintained the characteristics for 4 weeks.

In order to optimize the properties of previously developed sticks, especially to improve their ability to retain odors more efficiently, further studies have been conducted with the selected formulation. In the present work, the effect of different fragrance fixative agents evaluated for this purpose is reported. Benzyl benzoate, ForalynTM 5020-F (methyl ester of hydrogenated rosin), sucrose acetate isobutyrate and ambroxide (dodecahydro-tetramethylnaphthofuran) were selected to be tested for their fixative properties as at the used concentrations they did not give any odor to the sticks, therefore not masking the odorants.

- 16840 | Error related brain activity: A dimensional approach to anxiety and depression

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The diagnoses of mental disorders is still a source of discussion and disagreement in the field of psychology. The major diagnostic frameworks of psychopathology set specific criteria for several mental disorders, and defined thresholds in order to establish the boundaries between disorder and non-disorder. However, the high comorbidity between disorders calls into question the rigid boundaries between diagnoses. More recently, the NIMH (USA) initiated an alternative research framework, the Research Domain Criteria (RDoC), to reach a better understanding of psychopathology regarding the basic functional and dimensional mechanisms underlying mental disorders.

The Error-Related Negativity (ERN) is an event-related brain potential, represented in the RDoC framework, which occurs at or momentarily before an erroneous response. Previous works have associated internalizing disorders (e.g. anxiety and depression) with enhanced ERN's. However, although the relationship between the ERN and anxiety-related symptoms is well-established, findings concerning depression and the ERN amplitude have been mixed.

The present work intends to examine the effects of different anxiety and depressive dimensions and symptoms, across a continuum. For this purpose, a sample of 80 individuals completed two different tasks designed to elicit error-related neural activity (i.e., Flanker Task and a Sustained Threat version of the Flanker Task), during an EEG recording. Additionally, clinical entities (i.e., anxiety and depression) and RDoC's basic mechanisms (i.e., perfectionism) were measured.

The results showed that the clinical entities (i.e., anxiety and depression) were not predictors of the ERN amplitude. Interestingly, perfectionism predicted reduced error monitoring in both tasks. Therefore, along with RDoC's principles, it is suggested that the RDoC approach may be more informative to the psychopathological phenomenon.

- **16843 | East Timor In the Collections of Pictures of University of Porto's Natural History and Science Museum (MHNC-UP): An Information and Knowledge Network**
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East Timor is a territory that was occupied by Portugal, not only politically, administratively and socially, but also scientifically, from which highlights the materials produced during the scientific missions, as well as in other routes that were developed there, specifically during the Estado Novo period. From those initiatives, collections of materials emerged, which helped to perceive the territory's and its communities' different dimensions, including photographs and other types of images. However, and after the ending of Portugal's dictatorship, or even before, those collections became dispersed on different entities, individuals and institutions, and in distinct places, some of them their heirs. Among these, there is the Natural History and Science Museum of the University of Porto (MHNC-UP), which received part of the University of Porto's Anthropology Institute (IAUP)'s assets, containing some goods related to East Timor. This work's subject is its study, especially of the photographic and pictographic collections produced during those scientific missions, seeking its registration and the understanding of its uses, meanings and connections with other collections. From this reality, it is presented the identification of these materials, its contextualization and articulation with others, included in other institutions, and, ultimately, the elaboration of an information system, designed to build a knowledge network about the collections, its pictures and their routes and uses.

- 16844 | In vitro assessment of the cytotoxic activity of a cinnamic acid derived antimalarial compound for future evaluation of anti-Toxoplasma gondii activity

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The parasite *Toxoplasma gondii* is an intracellular protozoan and the etiologic agent of toxoplasmosis. This parasitosis has a worldwide distribution and it can be fatal in immunosuppressed patients, and when vertical transmission occurs, it can result in congenital toxoplasmosis, originating abortion or severe sequels for the newborn. The current therapy is prolonged and induces several side effects. Recently, cinnamic acid derived compounds were reported to possess anti-*T. gondii* activity. We have formerly developed cinnamic acid conjugates of antimalarial drugs, which revealed promising results regarding their activity against *Plasmodium* sp. and *Leishmania* sp.. As such, we are now exploring the potential of these conjugates as anti-*T. gondii* agents. The cytotoxic activity of chloroquine-p-methoxy cinnamic acid conjugate (CQ-C4-pOMe) was evaluated using Vero cells, a main host cell for *T. gondii* intracellular tachyzoites. The unconjugated building blocks, i.e., p-methoxy cinnamic acid (Cin-pOMe) and chloroquine (CQ-2) were used as controls. The cytotoxic activity of these compounds was evaluated by the MTT assay. The IC₅₀ of each compound was calculated using a nonlinear regression in the GraphPad Prism software program. To evaluate morphological changes induced by these compounds on Vero cells, image capture using inverted phase-contrast microscope and associated coupled image analysis system was performed. The IC₅₀ values obtained were of 25.98±1.52 µM, 115.95±34.13 µM and 223.35±64.70 µM for CQ-C4-pOMe, CQ-2 and Cin-pOMe, respectively. Concerning the morphology of Vero cells after treatment with CQ-C4-pOMe, an increase in intracellular vesicles was observed, in contrast with the vacuolization induced by CQ-2 and Cin-pOMe. Taking in consideration the IC₅₀ values obtained for these compounds, the anti-intracellular *T. gondii* activity will be evaluated in future work.

- 16845 | Smart Specialization and creation of new paths of regional development: the case study of the Porto Metropolitan Area

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The European Union (EU) has adopted smart specialization as a conceptual framework for the design of innovation policies. The specialization strategies aim to promote structural change in regional economies through an integrative, place-based approach which is tailored to the assets and knowledge bases specific to each region. Indeed, the cumulative and contingent nature of the innovation process has reinforced the idea that contextual conditions, which are associated with trajectories and path dependencies, influence the development of regional economies.

In this context, it is the economic, political, territorial and social characteristics that define the productive structure of the region, which generate mechanisms that condition the ability to renew and create new paths/trajectories of regional development. The main objective of this presentation is to understand the dynamics of economic transformation and the potential development of the Metropolitan Area of Porto, focusing on the existing industrial structure and the skills installed in terms of innovation capacity. Therefore, social network analysis methods were used to map the density and centrality of the actors involved in different collaborative patterns of knowledge creation, accumulation and diffusion directed to innovation and creation of new technologies. The presentation will highlight the economic activities that are changing, modernizing and promoting processes of related variety.

Keywords: Smart specialization; Path dependence; Regional transformations; Innovation networks

- **16847 | Application of FTIR Methodology for Wine and Spirits Quality Control**

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Nowadays, the search for new and improved methods is increasing. This, along with the growing concern with the quality control of wines, makes the Fourier-transform infrared spectroscopy (FTIR) technique increasingly important in the modern oenology. This technology allows for easy and fast chemical analysis in an eco-friendly and non-destructive way. This method is becoming a viable alternative to traditional analytical methods which are time consuming and difficult to perform. The present work will focus on the improvement of FTIR use for the analysis of Port and Douro wines. With this goal, two FTIR spectroscopy equipment's were used (WineScan FLEX and WineScan FT120) and adjustments were made to the previously existing calibrations of several analytical parameters. In the equipment WineScan FT120 the Alcoholic strength by volume (TAV) calibration for this determination in Port Wine was adjusted with more than 1000 wines. In the WineScan FLEX equipment the total acidity calibration for Douro wines was also adjusted to make it more accurate. Both the adjustments were then validated, in order to be ready to use in daily analysis. Furthermore, a statistic model was developed to differentiate certified Port wine from other types of fortified wine. This model was based in the Principal Component Analysis statistical method; it reduces the size of the original dataset by clustering samples together, based in a new set of variables known as principal components. The model was able to differentiate the wines with a 97% accuracy.

Key-Words: FTIR, Porto Wine, Douro Wine, Calibration, Validation, WineScan FT120, WineScan FLEX, Interference, Spectroscopy.

- **16848 | Development of advanced functional materials derived from MOFs for oxidative processes**

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Oxidative desulfurization (ODS) and oxidative denitrogenation (ODN) are promising sustainable and cost-effective methods to remove environmentally harmful sulfur and nitrogen compounds from fuels. The use of adequate catalysts is crucial for the viability and potential applicability of both ODS and ODN.[1] We have been developing novel heterogeneous catalysts based on Metal-Organic Frameworks (MOFs) and MOF derived materials for efficient ODS and ODN processes.[2] MOFs are crystalline 3D coordination polymers characterized by their interesting properties, excellent thermal, mechanical and chemical stability, and, when combined with polyoxometalates (POMs), reveal high synergistic effects towards the improvement of activity in oxidative catalytic systems. The effects of thermal treatments on MOFs have also been recently demonstrated to improve their performance as catalysts.[3]

Porous MOFs ZIF-8 and ZIF-67 were prepared under room temperature and pressure, and used as supporting materials for the immobilization of a molybdenum-based POM, aiming for the preparation of novel MOF-based composite materials. All of these were subjected to thermal treatments with the goal of altering their structure and promoting higher catalytic efficiency. The obtained materials were characterized by FTIR, XRD, SEM/EDS, TGA, ICP-OES and N₂ adsorption isotherms and were applied as heterogeneous catalysts for both ODS and ODN processes in model fuels.

Acknowledgments

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- 16850 | Iodine and Selenium urinary levels in pregnant women and their impact on neonatal outcomes: results from the IoMum cohort study

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Introduction: Iodine (I) and Selenium (Se) deficiency during pregnancy may increase the risk of low birth weight, but conclusive evidence is still lacking.

Aims: To evaluate the association between I and Se maternal status and birth outcomes in a cohort of Portuguese pregnant women (IoMum).

Methods: Pregnant women attending 1st trimester routine ultrasound scan at S. João Hospital Center were invited to provide a spot urine sample and information on sociodemographic and lifestyle characteristics. All women with 10-14 weeks of gestation with confirmed fetal vitality and who signed the informed consent were included. Women taking levothyroxine, with a twin pregnancy or giving birth after 6th June 2019 were excluded. Total sample size obtained: 199.

Urinary I and Se concentrations (UIC and USeC) were determined by inductively coupled plasma mass spectrometry (ICP-MS) according to the methods of the Center of Disease Control (CDC) 3018.3 and 3002.1. Multiple linear regression models were used to test for the association between UIC or USeC and weight (BW), length (BL) and head circumference (BHC) at birth, adjusting for several co-variables. Differences were considered statistically significant whenever $P < 0.05$.

Results: The prevalence of I and Se insufficient intake was 71% and 29%, respectively.

There was a trend for a positive association between UIC or USeC and BW percentile and for a negative association between UIC and the BL percentile.

Furthermore, multiple linear regression analyses showed an association between USeC and BW and BHC. Specifically, babies born to mothers with USeC above the reference range ($> 50 \mu\text{g/L}$) had in average more 175 grams in BW or 0.592 centimeters in BHC than babies born to mothers with USeC in the reference range ($15\text{-}50 \mu\text{g/L}$) ($P = 0.010$ and $P = 0.021$, respectively).

Conclusion: While pointing to a status of iodine insufficiency in our population, this study evidenced the impact of Se on fetal growth. Trial registration number: NCT04010708

- 16851 | Sport at School – from Pedagogy to Gender: An Analysis of the Perceptions of Physical Education Teachers

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Based on the themes of education, gender and sport as the pillar of this research work, we tried to understand the perceptions, practices, and meanings of these themes for the discipline of physical education and for the school sport. Through semi-structured interviews with physical education teachers, we tried to understand the place occupied by school sport and physical education in schools. Moreover, we tried to know the perception that PE teachers have on the issues of participation and inequalities in physical and sports activities and if they believe that their pedagogical actions as teachers may influence the involvement of students in school sport and physical education.

We verified the existence of some discrepancies between what is defined in official documents as goals of physical education and school sports and those that are the practices reported by the PE teachers. These gaps have been reflected in an exclusive valuation of the practical/technical aspect of the discipline, which has led to a ludic vision of it and has been devaluing the teaching-learning component and, consequently, pushing Physical Education towards secondary plans at school and in the training of young people. This trend to grant the supremacy of technical-practical issues, which is very pronounced in sports culture, compared to other components, also allowed us to conclude that, despite the issues of valuing the differences of each one and the gender issues themselves being a concern for these teachers, the truth is that through the interpretation of their speeches it is clear that these concerns are not yet fully reflected in their practices. Therefore, school sport and physical education as a means of integration end up falling a little short of its expected formative added value.

- **16852 | Stationary phases for liquid chromatography comprising two chiral moieties: synthesis, enantioresolution performance and recognition mechanisms**

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The resolution of enantiomers by liquid chromatography (LC) using chiral stationary phases (CSPs) is one of the most versatile and widely applied method in academic area and industry [1], being the development of new CSPs an important field of research [2]. This work focus on the preparation and enantioresolution evaluation of new CSPs.

In this study, two CSPs comprising two chiral moieties were successfully prepared by multi-step reaction pathways based on the most promising selectors previously reported [3]. We aimed to obtain versatile and efficient CSPs by exploring the effect of the number, chemical nature and position of the substituents in the central aromatic core of the chemical framework and, consequently, their effect on the enantioselective performance of the CSPs. The chiral selectors were covalently bonded to a chromatographic support, and further packed into LC stainless-steel columns (150 x 2.1 mm I.D.). Their enantioselective performance was evaluated using different classes of chiral compounds. Besides, assessment of chiral recognition mechanisms was performed by molecular docking approach, being these data in agreement with the obtained chromatographic parameters [4].

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- 16853 | M-dwarf stars with planets: towards the characterization of the smaller planet host stars.

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M-dwarfs are the most abundant stars in our galaxy. Furthermore, M-dwarfs are expected to host a large quantity of earth-mass planets. However, the derivation of atmospheric parameters for M-dwarfs is extremely challenging. Due to their cooler atmospheres, the presence of millions of molecular lines makes it very difficult to accurately model the atmosphere and perform a spectral analysis similar to their hotter counterparts.

Fortunately, the development of near-IR high resolution spectroscopy has already allowed to do significant progress in this field. This progress is of utmost importance for the characterization of planets orbiting M-dwarfs, since the determination of the radius and mass of a planet depends on our capacity to derive the radius and mass of its host star.

The main goal of this work is the derivation of M-dwarf parameters (effective temperature and metallicity) using high resolution near-IR spectra, closely following the work done in Önehag et al. (A&A 542, 26 - 2012). To achieve this studied an early M dwarf was studied, HIP 57172 B, through the fitting of synthetic spectra to high resolution near-IR spectra from CRIRES (ESO-VLT).

Both the temperature and metallicity estimated agree with the literature estimations, the metallicity determined is also compatible and within the estimated uncertainties of the better studied partner of the binary system, the K dwarf HIP 57172 A.

- 16854 | Preparation of bismuth and bismuth oxide materials for application on X-ray protection textiles

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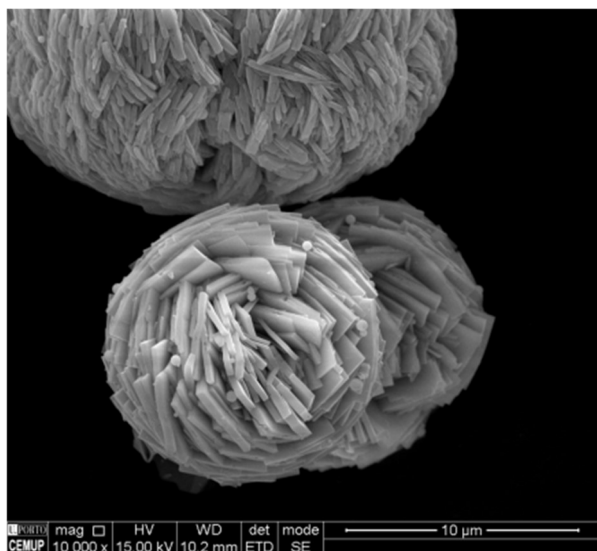
Exposure to high-energy or ionizing radiation from either particle-emissions such as alpha/beta, proton, electron, neutron emissions, or electromagnetic waves such as X-rays/ γ -rays, may result in carcinogenesis, cell mutations, organ failure, etc. X-rays (100 eV to 100 keV) are capable of penetrating several materials, being suitable for several industrial and medical applications (e.g., diagnostic and therapeutically procedures).[1] Lead-based protective materials have been used in the medical field to shield health professionals from accumulated radiation dosage. However, besides causing environmental contamination, conventional lead-based garments are heavy (density = 11 g/cm³) and uncomfortable, leading to back and neck injuries, fatigue and pain.[1] Metals/metal oxides with high atomic number and mass density (e.g., Bi, W, Bi₂O₃, SnO) have been explored as lead substitutes for X-ray shielding due to their lower toxicity.[2] The application of these metal and metal oxide materials within textiles can provide, not only protection against X-rays, but also make them lighter and environmentally friendly.[1]

In this work, nano and micro-sized particles of Bi and Bi₂O₃ were prepared by different synthetic approaches. The resulting materials were characterized by X-ray diffraction, Fourier transform infrared spectroscopy, Raman spectroscopy and Scanning Electron Microscopy coupled with energy dispersive X-ray spectroscopy. Different morphologies and crystalline phases were obtained for the prepared materials.

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SEM micrograph of Bi microparticles

- **16855 | Another look at the garden: Fragments of a selected landscape**

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Gardens know no cultural or temporal boundaries. In all civilized societies, the garden represents a refuge and an alternative to the rigors and bustle of everyday life, a promise of happiness, a source of aesthetic inspiration, rich, fertile and ever-changing, a mirror and a projection screen for the human utopias.

In the context of current art, the garden, as a reference, support, matter and process of artistic creation and production, has in fact been presented as a recurring pretext for the creation of new artistic projects, where artists find endless possibilities that allow them to illustrate operationally rich and thought-provoking practical and conceptual experiments.

The present research aims to problematize the way that the garden has been gaining space and preponderance in the field of thought and artistic practice over the time, which led it to become a stage of constant twists and metamorphoses, where its limits, identity, characteristics, context and values, have been constantly rethought, in order to claim new "territorialities". In this sense, concepts such as "territory", "deterritorialization" and "reterritorialization" of the french philosophers Gilles Deleuze and Félix Guattari have become central to understand some of these issues present in many works of art, that seek to explore these concepts in the creation of an intangible and imagined place.

In the light of these ideas, but also through a reading of our individual painting project called "O Olhar Aproximado" (2018-2019) and developed within the Master of Fine Arts, we will seek to demonstrate how the affective, kinesthetic and multisensory involvement of the artist with the garden its capable to renew its poetics, incessantly transforming it into a mobile territory full of "changing cartographies".

Keywords: Garden; Landscape; Painting; "Desterritorialization"; "Reterritorialization"

- **16859 | Bordering circumstances: The Wall**

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Looking at Earth from above allows us to observe a series of events, ranging from geological to anthropogenic, which have shaped its surface. Between tectonics, expressed in landscape monuments, and geopolitics, defined by man-made limits, we can identify patterns of bordering circumstances.

The wall is an architectural object which underlines the expressed phenomena, the meeting place between elements approaching contact. Catalysed by this conceptual motif, the exploration of different natures, arts and architectures translates the diversity of scenarios which can arise along this premise, from total separation or confinement up until transcendence of the hinted borders.

The present paper intends to reflect on these questions through a comparative exercise, presenting a couple of examples which share a similar abstract perimeter as a fundamental design theme. Robert Smithson's non-site evokes a dialogue between time and space, breaking from the restraint of the exhibition box and transporting us outside, to the birthplace of raw material. Solano Benitez' project for a family tomb invites us on a walk through the realms of nature, before arriving at the clearing where his father rests, a space for meditation where one is able to travel beyond the limits of comprehension, into the depths of existence. Both convey a sense of opening, which surpasses the physical border laid by the projected boundary.

This study is part of an ongoing thesis on Master's Degree in Architecture, at FAUP, 2019/20, under the supervision of Helder Casal Ribeiro. It is paramount to contribute to the growing body of knowledge in relation to the definitive and imposing nature of design in and of itself, through research on the invisibilities which permeate the dialogue between environment, architecture and people.

- **16860 | The roll of dice: Chance as an operative territory of art**
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This research discusses the way that a whole series of disruptive practices, action strategies and operative processes have gained relevance in the territory of current thinking and artistic practice since the beginning of the twentieth century.

If we consider these preponderant indicators to understand how many artists have been building a new series of methodological principles that allowed them to subvert a whole set of technical, poetic and aesthetic conditioning in the territory of artistic creation over the last decades, then we can understand that such processes were able to mobilize a kind of radical experimentation based on the paradoxical logic of the "game" into the territory of art.

Through the incorporation of these disruptive strategies of chance, it became possible to the artist not only to reinvent a whole series of practices and methodologies, but also to enhance a series of dynamics results and liberating processes.

In this sense, from the notion of "thought without image" (1964) proposed by the french philosopher Gilles Deleuze and the notion of "aesthetic unconscious" (2001) of the french philosopher Jaques Rancière, we seek to demonstrate how the work of art, through the instrumentalization of the operability of the "game", can be born blind as an unintended and an automatic response from a series of scheduled actions, that drags the agent of the action into the territory of an "experimental unconscious".

Keywords: Art; Game; Chance; "Aesthetic Unconscious"; "Thought without image"

- **16862 | Origin and evolution of the Determiner Phrase in the romance languages**

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The studies on Romance languages evolution links erosion of the casual system (Holmberg 1993), the increase of the use of prepositions (Perridon & Sleeman 2011) and a more rigid word order (Lyons 1999) to the appearance of definite and indefinite articles. This last phenomenon constitutes clear evidence of the emergence of the functional projection D(eterminer) P(hrase) (Stark et al. 2007). This presentation seeks i. to establish the morphosyntactic characteristics of the DP in the Romance languages, which make them typologically different from Latin; and ii. to identify possible paths of change and mechanisms of how a functional projection as DP emerges in language history. The combination of the theoretical proposals with the data analyzed points to the emergence of DP as a phenomenon of split of nominal inflection (Giusti 2015) and to the placement of the definite articles in AgrP. We will conclude, however, that the emergence of DP is not due to one fact alone, but to a set of them and that, as Bresnan (2001) says, the passage from a synthetic to an analytical language is a process in which morphology competes with syntax.

- **16864 | Unraveling the Protective Mechanisms Induced by Mucosal Immunization Against Neosporosis**

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Neospora caninum is an apicomplexan obligate intracellular parasite and is one of the main causes of abortion in cattle, being responsible for major economic losses in the beef and dairy industries. Vaccination is recognized as the most cost-effective approach to manage neosporosis, but currently, there is no commercial vaccine available. We previously showed that mucosal immunization with *N. caninum* membrane proteins (NcMP) plus CpG (TLR9 agonist) as adjuvant could successfully protect mice challenged with this parasite in an Interferon-gamma-dependent manner. Nonetheless, the cells and mechanisms involved in that protection are still unclear. Taken this into account, we aimed at identifying the cell populations and the mechanisms responsible for the observed protection. For this, we have immunized and infected C57BL/6 wild-type mice, mice with Macrophages Insensitive to IFN- γ (MIIG), and IFN- γ Knock Out (IFN- γ KO) mice and compared the parasite burdens and cytokine production in different organs. MIIG mice had serum antibodies titres - IgG1 and IgG2c – and production of IFN- γ and interleukin-17 in response to antigenic recall similar to WT mice. However, similarly to IFN- γ KO animals, MIIG mice were more susceptible to neosporosis than the WT counterparts, highlighting the requirement of IFN- γ signalling in macrophages for protection. To unravel what memory T cell populations, induced by vaccination, would be the main source of IFN- γ , we have transferred CD8+ or CD4+ T cells, sorted from immunized and sham-immunized mice, into sublethally irradiated IFN- γ KO mice. The recipient mice were then infected with *N. caninum*. Parasite burdens and the IFN- γ levels in the serum and in several organs were studied. By identifying which T cell populations are responsible for protective memory induced by immunization, we aim to further improve the immunization formulation by favoring the expansion/function of those protective memory T cells.

- 16867 | Geostatistics applied to initial potential of gas data recorded from wells – A case study

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This work describes the application of different non-geostatistical and geostatistical estimation procedures [1], to an initial potential of gas sample 2D data set, recorded from wells in West Virginia, USA [2]. The main objectives of the work is to compare the applied estimation procedures in mapping and modelling the data spatial variability, based on the sample data set, as well as obtaining probability maps of being spatially exceeded certain initial potential of gas - 1500, 2000, 2500, 3000 and 3500 MCFPD - thresholds.

The study comprises the following summarized steps applied to the sample data set [3]: exploratory statistical uni-variate data description; spatial non-geostatistical data characterization, including geometrical estimation methods such as inverse square distance, ISD, and moving windows statistics; structural analysis using experimental and theoretical fitted variogram models, as well as variogram surfaces and the cross-validation method to select a final continuous variogram model, before the final geostatistical linear and nonlinear estimation procedures, such as ordinary kriging, OK, and indicator kriging, IK. The software's SPSS, Excel, MatLab, GS+ and Surfer have been used in the applied data treatment procedures.

At the present stage of the work, the obtained results, although not pointing to a significant difference between the inevitable smoothing effects of the used non-geostatistical and ordinary kriging estimation methods, ISD and OK, generically illustrate the notorious comparative advantage of the geostatistical approach and, particularly of IK estimation maps, to assist in decision making and risk analysis based on modeling regionalized geosystems.

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- **16868 | Oxygen consumption assessment using different backward extrapolation methods and recovery curve kinetics**

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The assessment of oxygen uptake ($\dot{V}O_2$) in swimming has been performed after the end of exercise due to the constraints imposed by the aquatic environment. To achieve this, different methodologies have been used but never compared with gold standard. The purpose of the current study was to compare the $\dot{V}O_{2peak}$ determination using different backward extrapolations with the gold standard for its assessment – the average of the last 30 s of swimming ($\dot{V}O_{2dir}$). The $\dot{V}O_2$ recovery curve kinetics was also analyzed. Eighteen healthy swimmers performed a 5 x 200 m front crawl protocol, with increments of 0.05 m·s⁻¹ and 3 min intervals, allowing to identify the low to moderate, heavy and severe intensity domains. Respiratory gas exchange was continuously measured (during swim and the recovery periods) using a portable gas analyzer. Linear and exponential regressions applied to different interval times (first 20 s, 20 s starting at the highest value and from 10 to 30 s) and a mathematical model of the recovery curve were used to determine $\dot{V}O_{2peak}$. The rise in swimming intensity lead to an increase of the $\dot{V}O_{2peak}$ values when using $\dot{V}O_{2dir}$, linear and exponential regressions of the first 20 s (42.0 ± 6.2 , 42.8 ± 5.5 and 42.9 ± 5.6 ml·kg⁻¹·min⁻¹ for low to moderate, 46.4 ± 6.9 , 47.1 ± 4.9 and 47.5 ± 5.1 ml·kg⁻¹·min⁻¹ for heavy and 51.2 ± 6.9 , 51.2 ± 6.9 and 53.6 ± 8.5 ml·kg⁻¹·min⁻¹ for severe intensity domains, respectively; $p < 0.05$). The other studied recovery methods presented different $\dot{V}O_{2peak}$ values comparing to $\dot{V}O_{2dir}$, with proportional and systematic errors, corresponding to worst $\dot{V}O_{2peak}$ approximations. The mono-exponential function best fits in the low to moderate and heavy intensity domains recovery curve modelling. Conversely, the bi-exponential function characterized the severe intensity domain, showing a slow component with values of amplitude, time delay and time constant of 6.2 ± 2.3 s, 116.6 ± 24.3 s and 39.9 ± 15.2 s, respectively.

- 16869 | Social Disorganisation and Feeling of (In) security: A qualitative approach to the fear of crime

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A large body of criminological studies has focused on understanding the fear of crime and seeking to explore which individual and contextual factors influence its development. Regarding the latter, the most recent research suggests that there is a relation between community context (e.g. high levels of social disorganisation, such as low incomes, cultural heterogeneity and others) and the feeling of insecurity. This concept is usually analysed in three dimensions: fear of crime, perception of victimisation risk and behavioural expressions. Based on a qualitative approach, the aim of the present study was to grasp children's perception of their neighbourhood (a deprived inner-city area) and how this perception influences their integration process and their behaviour towards the risk perceived. Four structural issues arose from a semi-structured interview conducted in four children: 1) The contexts and fear figures -night was perceived as unsafe and thus avoided and cultural heterogeneity seems to be a concern for the residents; 2) protection by family and friends and the lack of legitimacy of police force; 3) the "others" and their perception about that community; 4) and crime depicted as an "ordinary phenomenon". In fact, children feel safe except during the night and in places they tend to avoid as they portray these as "unsafe and with strange people". They sustain thus that criminality, especially drug dealing, is part of their daily life and tend to normalise its perception. They have a clear notion of where crimes are committed, their actors, and thus avoid places and potential bullying situations. Several researches show that the study of neighbourhood processes is fundamental to understand the feeling of insecurity. This brief study suggests that certain social groups can increase fear of crime, nevertheless, some social processes, like bonds to community, can play an important role in promoting social cohesion, influencing the feeling of (in)security.

- 16870 | So many people without a house, so many houses without people: The Leal neighborhood case. 1974-2020

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This study is part of an ongoing master thesis on Master's Degree in Architecture, at FAUP, 2018/19, under the supervision of Alberto Lage, in a process of reflection about the historical evolution of the Leal neighborhood, located near the city center of Porto.

The single-family residential area had its origin at the time of the Industrial Revolution, with the creation of a workers' housing nucleus and went through several stages until today, among them the SAAL process, in 1974, which intervened in this sector of the city, with a project of social housing, authored by the architect Sérgio Fernandez, where the right of the underprivileged people to the city was upheld.

However, and as a problem of this research, the evolution of society, the political and socio-economic motivations, have disqualified this space, making it an undefined and forgotten over time. In recent years, there have been acquisitions of plots and demolitions ordered by the Porto City Council.

These actions, considered very polemic, especially when in the last 15 years three projects, related to social housing, have been conceived and designed to this specific place. One of these projects is associated with the investment fund of the Aleixo neighborhood, in exchange for its lots, and to ensure the re-housing of its inhabitants. Raising several questions about their current state, such as: Why none of these projects have advanced? Does the Council have any hidden intentions for this area? Is social housing still part of these plans, or do they have other plans more related to real estate investment and the tourist industry?

Therefore, we intend in this investigation to try to intersect the City, Architecture and current Politics in a strategy of action in the neighborhood, which enhances its transformation through a cohesive, open and interconnected relationship of the past with the contemporary city, while, simultaneously, defending everyone's right to housing and to the city.

- 16875 | Cyclophosphamide main bioactivation products cause disturbance in the metabolome of AC16 human cardiac cells at clinically relevant concentrations

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Cyclophosphamide (CYA) is widely used against several cancers, in autoimmune diseases and in bone marrow transplant conditioning regimens. Its cardiotoxicity may occur in high doses treatments and it is often linked to the exposure to cyclophosphamide's metabolites, namely 4-hydroxycyclophosphamide (HYA) and acrolein (ACRO). The underlying molecular mechanisms of CYA cardiotoxic effects are not yet fully explained. The aim of our study was to assess the effects of CYA and its metabolites in the metabolome of cardiac cells. Primarily, cytotoxicity assays were done with CYA, HYA and ACRO in proliferative and differentiated AC16 cardiac human cells. Intracellular metabolic profiling was then analyzed by GC-MS to detect early metabolome variations (at 24h), using subtoxic concentrations (LC05) of the three drugs. Cytotoxicity assays revealed that HYA and ACRO were more cytotoxic than CYA in both cellular states. In proliferative AC16 cells, HYA and ACRO caused significant changes in the intracellular metabolome, being those changes more marked for ACRO. The majority of changes in proliferative AC16 cells of the mentioned conditions occurred in the class of amino acids, fatty acids, sugars and carboxylic acids. In summary, CYA metabolites caused a more pronounced effect on human cardiac cells than the parent drug, regarding both the cytotoxicity profile and the induced disturbances in intracellular metabolome.

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- **16876 | CONDITIONS FOR THE FEASIBILITY OF IMPLEMENTATION OF INERT WASTE LANDFILL IN CARBONATED MASSES**

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Waste management is one of the critical challenges for sustainable development, as is the environmental recovery of degraded mining areas. This paper presents the conversion of abandoned quarries into controlled landfills for inert waste disposal as an alternative that joins the need to minimize these two environmental problems. This work aims to introduce the conditions for converting abandoned quarries into landfills for inert waste disposal, to make the project technically viable, economically feasible and environmentally responsible. For that purpose, a literature review of the subject was conducted in documents obtained from databases. Additionally, the calculation tool EXCEL was used for sizing and tools AUTOCAD, REVIT and SKETCHUP to illustrate the proposal. As a result, the conceptual conditions were presented, and a manual project guideline was prepared. The proposal was applied to a real situation of an abandoned quarry in Portugal to verify the usefulness and limitations of the manual in the elaboration of projects of this kind. It has found that a proposal is technically feasible and environmentally responsible, as the engineering techniques proposed for use are widely known and used, as well as appropriate to current environmental standards. So, it turns out that many benefits derive from the conversion of abandoned quarries to landfills, as the recovery of exploited areas is a legal requirement and filling the voids with soil is costly. Thus, often the minimal and ineffective solutions are adopted that do not return the area for useful use. The inert waste can be well used in these situations as it does not produce appreciable leachate and occupy a significant space in solid waste landfills. Also, after the landfill has been explored, the landscape is recovered, the risks of abandoned quarries are minimized, and the area can be reintegrated into adjacent landscapes. Keywords: Inert Landfill, Quarry Environmental Recovery, Inert Waste Management.

- **16878 | Amino acid profile of *Ulva rigida* and *Gracilaria vermiculophylla* seaweeds**
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Seaweeds are known for their richness in beneficial compounds to health. Their protein content is variable, being generally higher in green and red algae (10 to 30% of dry weight). Their complete essential amino acid profile highlight them as interesting sources of protein [1]. The aim of this study was to compare the amino acid profile of two seaweed species: *Ulva rigida* (green algae) and *Gracilaria vermiculophylla* (a red one). Both species were produced in Portugal, in an integrated multitrophic aquaculture system.

For tryptophan quantification, samples were hydrolyzed under alkaline conditions (4 M KOH, 110 °C, 4h). For the remaining amino acids, acid hydrolysis (6 M HCl, 110 °C, 24h) was performed. Hydrolysis were performed in triplicate. The hydrolysates were neutralized, submitted to an automated online derivatization with OPA and FMOC and analyzed by RP-HPLC/FLD. Amino acids were identified by comparing their retention times with those of known standards and quantified by the internal standard method using calibration curves obtained for each compound.

In general, *G. vermiculophylla* presented higher contents of essential and non-essential amino acids (41.66 ± 3.34 and 66.52 ± 2.24 mg/g freeze-dried sample, respectively) compared with *U. rigida* (36.30 ± 1.37 and 60.49 ± 2.11 mg/g freeze-dried sample, by the same order). Nevertheless, significant differences ($p < 0.05$) were found between the amino acid profile: while *G. vermiculophylla* presented higher contents of glutamic acid, glutamine, arginine, threonine, valine and isoleucine, *U. rigida* was richer in histidine, hydroxyproline and tryptophan.

Both seaweeds can be an interesting protein source for the human diet, as both provide all the essential amino acids. *G. vermiculophylla*, in particular, presented a higher amount of total amino acids. The consumption of seaweed should be promoted in Portugal, as it may be a sustainable alternative to traditional protein sources.

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- **16880 | Eat at school or out of school? Food consumption of students in secondary education in a private school**

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Introduction: Healthy eating is crucial for the normal growth and development of young people of school age, as well as for the promotion of their health, preventing diseases which one of the main risk factors is inadequate eating habits. Young people spend the majority of their time at school where they usually have at least one meal. It is important to promote healthy and adequate nutrition in the school community.

Aim: Evaluate the food consumption of students in secondary education at a private school and identify the main associated factors.

Methodology: The sample covered 135 students. A questionnaire was developed and directly applied, including socio-demographic and lifestyle information, food consumption in the previous 24 hours and place of consumption of meals (school or outside). The data descriptive analysis was followed by uni and multifactorial analysis to characterize the study sample according to the defined objectives.

Results: Most of the respondents did not consume complete meals, being dinner the most incomplete one (89.6%). The school canteen is the usual lunch spot for 63.7% of the students, while 24.4% do it outside the school and 11.9% take packed lunch. Lunches held in the school canteen and out of the school were more complete than those consumed by packed lunches. All of the participants practiced physical activity at school and spent an average of 2.7 hours in sedentary activities. The possibility of practicing a complete/ adequate lunch decreases with increasing hours of physical inactivity.

Conclusion: Most of the students did not eat meals completely, nor performed the recommendations of physical activity. A negative relationship with statistical significance was found between the practice of a complete/ adequate lunch and the hours of physical inactivity.

Keywords: Food consumption; Lunch place; Lifestyles; School age; Private school

- **16882 | Oxygen uptake repeatability at different swimming intensities**

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Oxygen uptake ($\dot{V}O_2$) is considered an important physiological variable in swimming, particularly for performance evaluation. However, studies that aim to analyze its stability over time are very scarce. Our aim was to assess the $\dot{V}O_2$ repeatability at different swimming intensities in a short-time period. Eight swimmers (25.0 ± 6.6 years old, 175.4 ± 8.5 cm of height and 71.7 ± 10.3 kg of body mass) performed a 7 x 200 m front crawl protocol (increments of $0.05 \text{ m}\cdot\text{s}^{-1}$ and 30 s intervals) in two different moments (M1 and M2), two days apart. Respiratory gas exchange was continuously measured breath-by-breath using a portable gas analyzer (Cosmed, Italy) and $\dot{V}O_2$ values were obtained by the average of the last step final 30 s. Swimming velocity was controlled using a visual pacer (KulzerTEC, Portugal) with flashing lights placed on the bottom of the pool. A paired student's t-test was used, as well as correlation and dispersion coefficients. $\dot{V}O_2$ values obtained in M1 and M2 were (respectively): (i) 29.9 ± 4.6 vs 29.7 ± 3.8 , 33.1 ± 5.0 vs 33.2 ± 5.0 , 36.0 ± 5.5 vs 35.5 ± 5.3 and 38.2 ± 4.8 vs $38.9 \pm 5.1 \text{ ml}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$ (at the low to moderate intensity domain); (ii) 42.1 ± 5.6 vs 41.3 ± 5.2 and 44.5 ± 6.8 vs $43.9 \pm 6.4 \text{ ml}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$ (at the heavy intensity domain); and (iii) 47.4 ± 6.2 vs $45.7 \pm 5.9 \text{ ml}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$ (at the severe intensity domain). Similar values were observed between M1 and M2 ($p > 0.05$; $d = -0.1-0.6$) for all intensity steps and excellent direct correlations were observed ($r > 0.90$; $p \leq 0.05$). In addition, the intraclass correlation coefficient (ICC) was excellent ($\text{ICC} > 0.90$; $p \leq 0.001$) and there was a high level of agreement between values for all steps (bias: $-0.2-1.7 \text{ ml}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$). Finally, the variation and repeatability coefficients between M1 and M2 ranged from 2.3-3.8% and from 1.8-3.4 $\text{ml}\cdot\text{kg}^{-1}\cdot\text{min}^{-1}$ (respectively). Data evidenced a great repeatability in the $\dot{V}O_2$ values at different swimming intensities in a short-time period.

- **16885 | Biocide potential of eucalypt leaf biomass generated after a wildland fire**

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Along with climate change, the native forest replacement by exotic species, such as *Eucalyptus globulus* Labill., is contributing to a highly fire-prone environment. Since *E. globulus* detains many strategies for regenerating vegetative growth, sustainable practices are needed to manage eucalypts stands. In this context, eucalypts' allelopathic potential can be used for weed control. However, effective doses, application modes, action mechanisms and environmental safety of eucalypt-based biocides are still unknown. In this way, this study aimed to develop an eco-friendly biocide from young eucalypts leaves, resulting from the sprouting after a wildfire. For this purpose, leaves from *E. globulus* of a recently burned area were collected and used to prepare 3 types of aqueous extracts (100 g/L), with: fragments of fresh leaves(FF); fragments of dried leaves(DF); powder-grinded leaves(DP). Each extract was diluted to achieve the concentrations of 0, 25, 50 and 100 g/L. Afterwards, in order to test the most effective processing mode and applied dose, purslane (*Portulaca oleracea* L.) plantlets were foliar sprayed, 5 times a week, with each dilution of every extract. Glyphosate was used as a positive control. For 1 month, macroscopic toxicity and mortality were monitored. Results showed that DF had the most powerful herbicide activity, while FF was the least effective extract, comparing to the control (untreated plants). Moreover, all extracts impaired the normal shoot and root growth, especially DF, in a concentration-dependent manner. However, regarding lipid peroxidation and photosynthetic pigments, no differences were detected between groups. Overall, aqueous extracts made from young eucalypts leaves possess high biocide activity, especially when dried and reduced to small fragments. Additional studies are being carried out to obtain the phytochemical profile of the biocide, as well as to assess its environmental safety to non-target plants.

- **16888 | Justice in Education**

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This paper, carried out in the field of Philosophy of Law, deals with chapter VIII of Michael Walzer's *The Spheres of Justice*, entitled "Education." Specifically, I will address two particular issues: basic and specialized education, and their distribution criteria.

The aforementioned author fits into communitarianism - a philosophical conception that seeks to offer a definition of justice through the recognition of a diversity of ethnic cultural identities evident in today's society. It is therefore pluralistic in the sense that it admits that different societies look at justice differently.

Considers that in society there is a process of distribution of social goods, each of the spheres of justice being composed of one or more of these goods. In his work, Walzer presents those which he considers to be somehow unanimous, one of them being precisely the sphere of education.

Using a concept of complex equality, the author presents those that he considers to be the fairest distribution criteria for education. To do so, he uses various examples from real life, from a historical perspective, to illustrate his thesis.

In this exhibition, I propose to analyze his conception of justice, as well as to present some points which, in my opinion, are susceptible to densification or improvement.

- 16889 | Influence of carbohydrate and protein pre-exercise supplementation on middle-distance runners oxygen uptake kinetics

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Oxygen uptake ($\dot{V}O_2$) kinetics and nutritional related studies help better understanding the physiological response to exercise. We aimed to assess if pre-exercise intake of carbohydrate (1.0g/kg) and carbohydrate plus protein (0.75+0.25g/kg) influences $\dot{V}O_2$ kinetics. Ten middle-distance runners performed three times a 7x4min intermittent protocol (1min intervals and 1km/h increments), 30min after ingesting a placebo, carbohydrate and carbohydrate plus protein beverages. Respiratory gas exchange and capillary blood samples were evaluated identifying the low to moderate, heavy and severe intensity domains. $\dot{V}O_2$ kinetics in the first two domains was better fitted by a mono-exponential model while a bi-exponential model adapted better to the hardest exercise domain. $\dot{V}O_2$ fast kinetics amplitude ($[31.6\pm6.9-34.2\pm6.2]$, $[35.9\pm8.6-37.1\pm6.4]$ and $[35.9\pm2.4-36.7\pm6.6]$ ml·kg⁻¹·min⁻¹), its time delay ($[11.1\pm5.8-12.3\pm4.6]$, $[9.7\pm4.3-13.1\pm3.5]$ and $[3.6\pm3.3-5.5\pm3.6]$ s) and time constant ($[28.1\pm6.2-30.0\pm6.8]$, $[23.5\pm8.8-31.9\pm5.8]$ and $[29.8\pm4.5-31.6\pm6.7]$ s) and blood lactate concentrations ([La⁻]; $[1.8\pm0.5-2.0\pm0.9]$, $[4.6\pm1.5-6.4\pm2.6]$ and $[7.0\pm2.4-8.7\pm2.0]$ mmol·L⁻¹) in low to moderate, heavy and severe domains, as well as $\dot{V}O_2$ slow kinetics amplitude ($[6.6\pm6.6-12.1\pm9.0]$ and $[7.2\pm3.4-10.1\pm3.2]$ ml·kg⁻¹·min⁻¹), its time delay ($[125.9\pm90.6-151.2\pm24.0]$ and $[106.2\pm32.1-118.9\pm20.5]$ s) and time constant ($[68.7\pm398.8-73.0\pm40.9]$ and $[71.3\pm12.1-76.2\pm8.3]$ s) in heavy and severe domains, were similar ($p>0.05$) between conditions in each intensity domain. Heart rate in carbohydrate and placebo (in severe domain) and respiratory quotient in placebo (in low to moderate domain) were lower than in carbohydrate plus protein (188 ± 6 vs. 187 ± 7 vs. 192 ± 7 b·min⁻¹ and 0.90 ± 0.04 vs. 0.93 ± 0.04 ; $p<0.05$). The intake of carbohydrate and carbohydrate plus protein beverages did not decisively influenced any $\dot{V}O_2$ kinetics related parameter in middle-distance runners at the intensities usually used both in training and competition.

- **16897 | Copper impact on barley plants grown in a natural agricultural soil**
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Although copper(Cu) occurs naturally in soils, several human activities are potentiating the accumulation of this metal in the environment, where it can exert negative effects on different organisms. Besides derived from industrial purposes, Cu can also reach the environment through agricultural practices, as it is present in a wide range of agrochemical products, being allowed for organic farming. Thus, Cu is currently one of the most common metals found in agricultural soils above background values. Therefore, understanding the potential risks of Cu in plants needs to be addressed, since Cu bioavailability and mobility vary considerably among soils. This work aims at evaluating the impact of Cu on barley (*Hordeum vulgare* L.) plants grown in natural agricultural soil. For this, a natural soil (Vairão, Porto, Portugal) was collected and characterized by the determination of several parameters. Data obtained showed that this soil was rich in organic matter (7%), with high water holding capacity, and pH appropriated to plant growth (6.06). Subsequently, barley plants were grown in the same soil but previously contaminated with 8 different Cu concentrations (0-1350 mg kg⁻¹ Cu; 1.5 dilution factor). After 14 days of growth, plants were collected and biometric parameters, lipid peroxidation (LP) and hydrogen peroxide (H₂O₂) levels were evaluated. The impact of Cu on plants occurred mainly on the roots, as demonstrated by the significant decrease in root length, and fresh and dry biomass. In shoots, only dry weight was reduced. Furthermore, H₂O₂ levels and LP increased significantly in both organs of Cu-treated plants, which evidenced signs of oxidative stress. Altogether, the results point to a toxic effect of Cu on plants grown in a natural agricultural soil, especially on the roots. Once identified the phytotoxic concentrations of Cu, the use of wrack as a soil amendment is currently being tested as a potential way to mitigate the contamination of soils with Cu.

- **16899 | OCCUPATIONAL STRESS IN DECISION MAKING IN EMERGENCY SITUATIONS IN FIREFIGHTERS TEAM LEADERS**

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The firefighters, due to the nature of their work, have a risky profession (Curilem, Almagià, Yuing, & Rodriguez, 2014), which requires quick and timely responses and responsibilities, in particular those who take on leadership roles. The decision that they take in emergency situations, have a high impact on itself, as well as in the team and in everyone involved (Reis, 2018). The present study has as main objective to explore, in the population of fire team leaders, the relationship between occupational stress and decision-making in emergency situations. Specifically, considering the emergency situations, it is intended to answer the following research questions: 1) What decisions the team leaders take in; 2) What factors influence the decision making of team leaders? and 3) the existence of occupational stress affects the quality of the decisions taken by the team leaders?

This is an embedded simple case study (Yin, 2009), qualitative, cross sectional and exploratory. The data were collected through documentary analysis, the application of logbooks and semi-structured interviews to firefighters with leadership functions. Data were submitted to a content analysis, through Nvivo software 11.

The results showed that is during the occurrence that the team leaders take more decisions, associated in particular with the assessment and with the guarantee of safety of the own team. In addition, it was noted that several factors affect their decisions before (e.g., available means), during (e.g., popular pressure, kind of occurrence and distress) and after (e.g., state of mind) the occurrence. Finally, it was found that the existence of distress affects the quality of occupational decisions taken by team leaders. The present study may be a contribution to the design of interventions to improve the quality of the team leaders decision in potentially stressful situations.

Keywords: occupational stress, decision-making, team leaders, Portuguese volunteers firefighters, emer

- **16902 | Pollen Raman spectra database for automatic identification**

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In the past years, some techniques have been tested to achieve an automatic pollen identification and quantification, among them spectroscopic analysis.

Our study aims to build a reference Raman spectra library of pollen from 28 species belonging to trees, weeds and grasses and test it in automatic pollen identification.

The pollen was collected in Porto city during the flowering period. A Xplora Horiba Jobin-Yvon Raman spectrometer interfaced to an Olympus optical microscope was used for the pollen characterization at the excitation wavelength of 785 nm and on a fingerprint spectral range of 1000-1800 cm^{-1} .

The reference spectra were pre-processed by baseline correction, normalized to constant area (100 a.u.) and smoothed to reduce noise and enhance the spectrum quality. Afterwards, deconvolution of the spectra was performed in order to extract the Raman parameters of prominent peaks.

Questionable pollen samples from different species were matched against the reference library testing different classification algorithms.

All pollen species presented a fingerprint area within the functionality region between 1500 and 1700 cm^{-1} sharing the same bands but with different Raman parameter values. Also, pollen-specific bands that helped in the discrimination were observed.

Our results showed that it is possible to make a distinction between the different species even within the Poaceae, in which a difference at the species level is not possible under the optical microscope.

So, Raman microspectroscopy is a promising technology for application within Palynology for instance in Aerobiology for real-time airborne pollen detection.

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- 16904 | The L-Leucyl-L-Serine Nano-channels as a Gas Storage System. A Non-Equilibrium Molecular Dynamics Study

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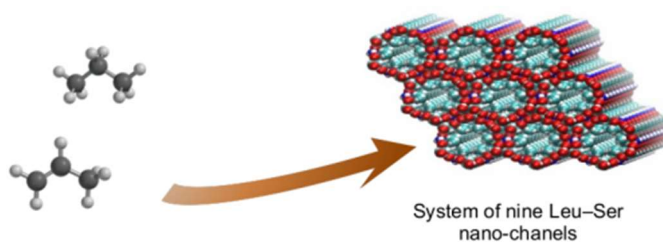
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Dipeptide crystals are porous crystalline structures with high density of uniform and well defined pores at the nanometer scale. These materials formed by dimers of natural amino acids, devoid of metal centers, are environmentally friendly and have promising applications in storage and selective separation technology applications [1-3].

This work is focused on the L-leucyl-L-serine (LS) dipeptide system and the ability to store propane and propylene molecules. Molecular Dynamics (MD) simulations is a valuable computational tool for the study of such types of systems[3], providing complementary data to experimental studies. Based on the structure obtained from X-ray crystallography[1], a molecular model of nine nanopores was considered for the simulation box using GROMACS package.

Preliminary results have shown that crystal structure is able to relax in order to adsorb gas molecules in the interior of the nanopores. However, by increasing the number of adsorbed molecules, a critical point is reached after which the structure is disrupted. In the case of propane this threshold is 1.9 nm^{-1} .



Gas storage on the Leu-Ser nano-channels

- 16905 | Antimicrobial peptides as a promising tool for kiwifruit bacterial canker disease control

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Pseudomonas syringae pv. *actinidiae* (Psa) is the etiological agent of bacterial canker disease of kiwifruit. Psa Biovar 3, the most virulent of all, has reached pandemic proportions, and is believed to be largely disseminated. In Portugal, considered as the ninth largest kiwifruit producing country in the world, Psa has been causing high economic losses every year, and is consequently a constant threat to kiwifruit producers. Antibiotic treatments in agrosystems have been forbidden by European Union directives to prevent the rise of antibiotic resistant bacteria, and the current control methods are mainly based on copper compounds, which efficiency have been hampered by the emergence of copper resistant Psa strains. This reality fostered the urgency to search for alternative phytosanitary treatments and develop new approaches for the control of this phytopathogen.

In the past few years, antimicrobial peptides (AMPs) appeared as having a high potential for application for control of pathogens. Beyond AMP's broad-spectrum of action and their bactericidal effect at low concentrations, it is hypothesized that these peptides have multiple cell targets, which hinders the development of resistance mechanisms to these biomolecules.

In this study, antibiograms were performed with 3.1, CA-M, BP100, RW-BP100, D4E1 and Dhvar-5 peptides, at eight different concentrations from 0.4 to 200 μ M each, against twenty four Psa strains isolated from Portuguese kiwi orchards. While D4E1, BP100 and Dhvar-5 peptides did not show noteworthy bactericidal effects against the tested bacteria, 3.1, CA-M and RW-BP100 peptides revealed to be inhibitory at concentrations above 6.2 μ M, suggesting their aptitude as front line molecules to combat bacterial canker disease of kiwi. Altogether, these results raise the need for further studies to better understand their molecular action both in culture and in diseased plants.

- **16906 | A forest ruled by the symmetric group**

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Symmetry is a notion that permeates all fields of mathematics, manifesting itself as a group action. Like so, it is crucial to understand how groups act on sets and studying linear actions on vector spaces turns out to be particularly fruitful. Here, we delve into a specific action of the finite symmetric groups on a special type of numerical trees and try to find the irreducible components of the associated representations. It turns out that these are induced representations of the trivial one, where the underlying subgroups are tree stabilizers depending heavily on their shape. Along this journey, we apply some classical methods of finding irreducible representations, aiming to decompose induced representations coming not only from direct products but also from wreath products of symmetric groups.

- **16910 | Evaluation of the effect of Ionic Liquids on β -Galactosidase**

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Ionic liquids (IL) have been applied in diverse areas from electrochemistry to pharmaceutical industry and nanotechnology [1]. They have also shown promising activity to substitute organic solvents due to their chemical and physical properties, that also contributes for a greener chemistry [2]. The structure has shown to influence enzymes and in bioassays can be used to improve catalysis or to measure inhibitory effect (toxicity).

In order to evaluate enzyme activity, it was used 4-methylumbelliferyl- β -galactopyranoside that after hydrolysis results in a fluorescent compound, whose intensity is proportional to enzyme activity and allows the evaluation of ILs in different conditions [3].

These were done using an automatic sequential injection system (SIA), to provide simplicity, efficiency and precision.

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- **16911 | What can Disneyland teach journalists about virtual reality storytelling**
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This research argues that the design principles that designers applied in the construction of Disneyland can help journalists to understand how to create better experiences in virtual reality journalism. We live in the age of distractions, as the amount of information at our disposal has never been higher, and people have come to expect constant stimulation. This creates a problem for journalists, especially for those who need to tell long stories, such as documentaries, as they must hold people's attention for long periods. Under this context, journalists are starting to experiment with interactive experiences through virtual reality. And the biggest selling point of this medium is "immersion." This term refers to the sensation that people have of actually being in the story's world whilst experiencing it in virtual reality journalism. But creating immersion goes beyond strapping a virtual reality headset to people's faces and dropping them in a virtual world. It takes careful planning and meticulous design decisions. And, due to a lack of education, this is an area in which journalists struggle, thus preventing them from unleashing the full potential of virtual reality journalism. In this regard, they can learn plenty from the best example of immersion that we have today: Disneyland. It features a fantasy world and visitors report being "lost in its magic, oblivious to the outside world." They get immersed. This is no accident. This is the result of the use of 10 design rules known as "Mickey's 10 Commandments," which are a set of guidelines that aim to create locations that are as immersive as possible. Therefore, our research argues that it might be useful for journalists exploring virtual reality to do the same, and take a close look at the design principles behind Disneyland, to learn how to create immersive experiences in virtual reality journalism.

- 16912 | Electrochemical Sensing of a Novel Psychoactive Substance (NPS) Using Screen-Printed Electrodes (SPEs)

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In this work we propose a sensor based on the construction of a molecularly imprinted polymer (MIP) on the surface of a screen-printed carbon electrode (SPCE) modified with multi-walled carbon nanotubes (MWCNTs) and silver nanoparticles (Ag NPs) to the selective sensing of the synthetic cathinone methylenedioxypyrovalerone (MDPV), a novel psychoactive substance (NPS) that acts as a norepinephrine-dopamine reuptake inhibitor. The development of MIPs by electropolymerization directly on the working electrode surface enables a simple way of controlling the polymer features (1), thus the construction of the sensor was optimized through study of the parameters of each step, namely the monomer:template ratio, the number of polymerization cycles, the extraction solvents and timing, as well as the incubation period of the sensors with the analyte. Furthermore, each step of the sensor construction was evaluated through cyclic voltammetry (CV) and electrochemical impedance spectroscopy (EIS) using $[\text{Fe}(\text{CN})_6]^{3-/4-}$ as redox probe. The analysis of MDPV was then performed directly measuring its oxidation signal at the surface of the developed sensors.

Electrochemical MIPs synergistically combine the MIPs' advantages, in particular their selectivity, with the inherent gains of electrochemical sensors, like sensitivity, simplicity and portability, critical features for in-the-field applications.

Acknowledgements

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- 16913 | Beneficial effects of ascorbate on the tolerance of *Solanum lycopersicum* L. exposed to NiO nanomaterial – an in vitro approach

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The development of nanotechnology has been accompanied by an increase of the emission of many contaminants. Among these, nanoparticles (NP) have become a source of contamination over the last years. Due to their unique properties and small size, NP can quickly affect different organisms, being first detected in plants due to their direct contact with the soil. Therefore, unraveling the influence of NP on the development and physiology of plants, as well as developing new ways to counteract their potential toxicity, has become a recent topic of research. Thus, the present study aimed to evaluate the ability of ascorbate (AsA), as an antioxidant, to enhance *Solanum lycopersicum* L. cv. Micro-Tom (tomato) tolerance to nickel oxide nanomaterial (nano-NiO). To this end, tomato seeds were germinated in 0.5x MS medium, containing 1.5% (m/v) sucrose and supplemented, or not, with 150 mg/L AsA and/or 30 mg/L nano-NiO. After 28 days, plantlets were collected and used to evaluate growth traits (biometrics and biomass) and oxidative stress markers [hydrogen peroxide (H₂O₂) and lipid peroxidation (LP)]. At the macroscopic level, nano-NiO induced the appearance of leaf chlorosis, which was efficiently counteracted by AsA. Regarding plant growth, the presence of nano-NiO significantly reduced root length and both shoot and root fresh biomass. Upon AsA supplementation, growth was partially restored, especially root length. Concerning LP, no changes were found among experimental groups. Moreover, although the spectrophotometrically quantification of H₂O₂ did not change, results from fluorescence microscopy revealed an overproduction of H₂O₂ in nano-NiO-exposed plants, in relation to the control plants and to those treated with AsA. Overall, it can be concluded that nano-NiO has proved to be toxic to tomato plants and that AsA can be a possible mitigator of this phytotoxicity, although further studies are needed to unravel the main mechanisms behind AsA's protection role.

- 16917 | Box-Behnken optimization of edible starch films reinforced by fibers and lignin extracted from chestnut (*Castanea sativa*) shells

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Polysaccharides are a suitable option to reduce the use of petroleum-based plastics. In particular, starch films are one of the most promising options due to biodegradation, non-toxicity, large availability and low cost. However, the main disadvantage of starch films is the poor mechanical properties. To overcome this limitation, it has been suggested the addition of fillers, such as fibers or lignin, from natural resources. Chestnut shells, the principal by-product from chestnut processing industry, could be potentially used for the extraction of these fillers. This research aims to study the incorporation of fibers (CSf) and lignin (CSl) extracted from chestnut shells in starch films to improve the mechanical properties.

CSf was obtained by an adaptation of Collazo-Bigliardi et al. protocol. Briefly, dried chestnut shells were milled, treated with NaOH 5% (m/v), washed with pure water and dehydrated. CSl fraction was obtained according to Souza de Miranda et al. procedures. A Box-Behnken design with four factors at three levels was applied to study the individual and interactive effects of film composition. The independent variables were glycerol (25-75% starch dry weight (sdw)), CSf (0-30% sdw) and CSl (0-60% sdw) and the four responses evaluated were: Y1-Oxygen Transmission Rate (OTR); Y2- Water vapour transmission rate (WVTR); Y3-Elongation at break (E) and Y4-tensile strength (TS).

Overall, the CSf and CSl significantly ($p < 0.05$) increased the mechanical properties of the starch films; although the CSl had a negative impact on the color properties. The results of this work support the application of fibers and lignin from chestnut by-products for the development of reinforced starch edible films.

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- **16919 | The impact of the curricular reform on the teaching of Pediatrics at the Faculty of Medicine of the University of Porto (FMUP)**

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Background: Revising a medical curriculum is a complex, challenging, process, that can have a lasting impact in the quality of future generations of physicians. The Faculty of Medicine of The University of Porto (FMUP)'s 5th year Pediatrics course has recently been updated from block-based rotations to an integrated clerkship. Thus, this study's aim was to assess the impact of curriculum changes in the course of Pediatrics on the academic performance of medical students at the FMUP.

Methods: We compared the student's academic performance on the course of Pediatrics over four consecutive school years. Two years of block rotations (2015/16 and 2016/17, n=542) and two years of integrated clerkship (2017/18 and 2018/19, n=609) were analyzed regarding the 5th year (short-term), as well as three years (2016/17, 2017/18 and 2018/19) relating to the 6th year (long-term).

Results: The 5th year's median score (P25-P75) was 15 (14-16), 17 (16-18), 16 (14-17) and 15 (14-17) for years 2015/16 through to 2018/19 ($p < 0.001$), respectively. The median score of the 6th year was 17 (16-18), 17 (17-18) and 18 (17-18) for years 2016/17 through to 2018/19 ($p < 0.001$), respectively. Spearman's correlation between the 5th and 6th years' scores was 0.25 ($p < 0.001$). Considering only the first assessment, regardless of season, or only the first assessment in the regular season, results were similar. There was no interaction observed between academic year and the association between 5th and 6th year grades.

Discussion: The curricular reform appears to have had an impact on the 6th year's Pediatrics student performance, but little to none on the 5th year's. In terms of better discrimination in 6th year's grades, it also showed no significant impact. In conclusion, the impact of the curricular reform on student academic performance in the course of Pediatrics appears to have been little to nonexistent, in both short and long term.

- 16921 | Melanocortins act as stress-response modulators in adipose tissue of obese mice.

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Progressive dysfunction of adipose tissue (AT) exhibits impaired metabolic and redox dynamics and constitutes a key process in the pathogenesis of obesity. The melanocortin neuropeptide alpha-melanocyte stimulating hormone (α -MSH), long known for promoting satiety signals, was recently shown to also act in AT to ultimately improve lipid and glucose profile of obese mice. Current work aims to clarify if amelioration of this metabolic profile occurs concomitantly with the modulation of AT stress-response pathways and autophagy signalling, mechanisms commonly dysregulated in obesity.

In the present work, diet-induced obese C57BL/6 mice were intraperitoneally injected with α -MSH (150 μ g/Kg/day) or saline solution for two weeks. Then, inguinal subcutaneous white adipose tissue (ingWAT) was collected and analysed for ER stress, oxidative stress and autophagy biomarkers through western-blotting and qPCR techniques. Lipid peroxidation levels were evaluated using TBARS method and protein carbonylation by oxyblot.

Our data reveals that α -MSH decreases the expression of ER-stress transducer PERK and downstream activation of eIF2 α in ingWAT. Attenuation of IRE1 α pathway is also suggested due to lower levels of spliced Xbp1 mRNA. Accordingly, amelioration of the oxidative profile is also observed in α -MSH-treated mice, implied by the decreased expression of mitochondrial enzyme SOD2, reduced phosphorylation levels of general stress transcription factor NF-kB and diminished levels of oxidized lipids and proteins. Moreover, α -MSH also downregulates the expression of several autophagy-related genes in ingWAT: Lamp-2, Sqstm1 and Lipa.

A novel role for α -MSH is highlighted in the present study, due to its beneficial effect against obesity-induced disruption of redox homeostasis in ingWAT.

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- **16922 | What Basic Values Influence Impulse Buying and Status Consumption?**

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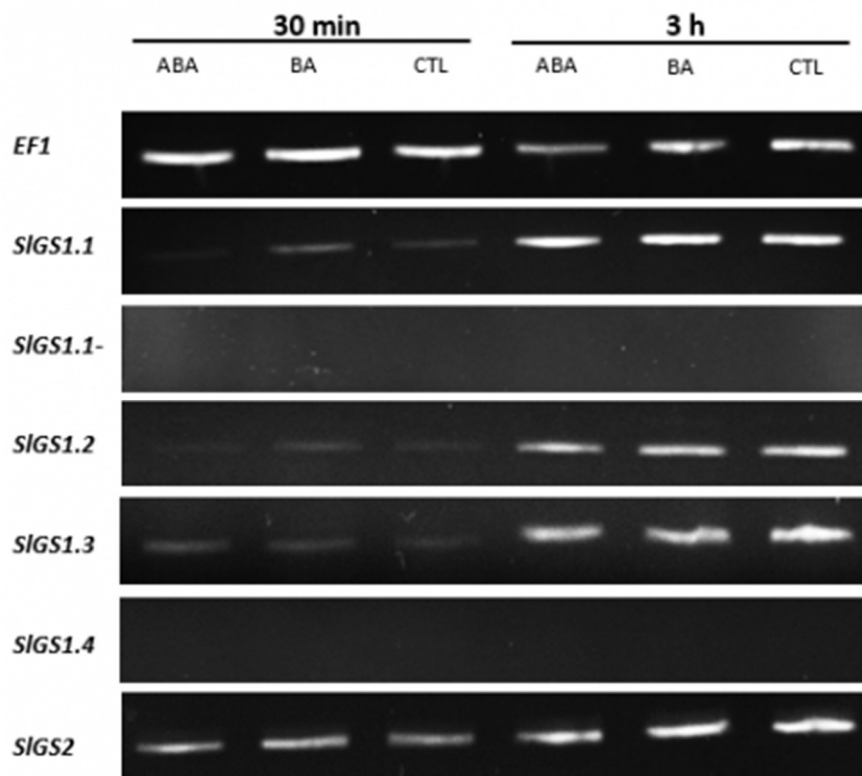
Values are responsible for guiding people's choices and behaviors, namely consumer behavior. The aim of this study is to identify which basic human values predict impulse buying and status consumption. Participated in the study 613 Portuguese adults (382 females, 225 males and six defined their gender as "other"), with a mean age of 25.09 years ($SD = 8.45$). Three scales were used: (1) Basic Values Survey, (2) Impulsiveness Buying Scale (short version), and (3) Status Consumption Scale. Data was obtained by an online survey distributed in social media from September 2018 to February 2019. The data was analyzed using the Statistical Package for the Social Sciences (SPSS), version 25. Pearson's r Correlations and Multiple Linear Regressions were carried out. The survey included an informant consent which presents the aim of the investigation. The correlations results show that the subfunction Promotion is positively correlated with impulse buying and the subfunction Interactive is negatively correlated. Excitement, Promotion and Existence are positively correlated with status consumption. The regressions results show that the subfunctions Promotion and Interactive predict impulse buying and the subfunctions Promotion and Suprapersonal predict status consumption. This study reinforces how the values which people prioritize in their lives influence consumer behavior.

- 16923 | Influence of the hormones Absciscic Acid and Cytokinins in Tomato's Glutamine Synthetase gene expression

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Glutamine Synthetase is an enzyme involved in nitrogen assimilation and recycling in plants and a potential target for improving nitrogen use efficiency. However, little research has focused on the influence of phytohormones on the expression of the GS-encoding genes. This study tested the effect of Absciscic Acid (ABA) and Benzyladenine (BA) in the expression of the four *SlGS1* genes (*SlGS1.1-SlGS1.4*) and *SlGS2*, in detached tomato leaves, after 30 min and 3 h. The results indicate that the *SlGS* genes are differently regulated by the tested hormones, their expression being overall induced by BA after 30 min. ABA induced an accumulation of *SlGS1.3* transcripts and lead to an opposite effect for *SlGS1.1* and *SlGS1.2*, in the same exposure time. After 3 h, neither phytohormone had an influence on the GS-encoding genes' expression, which reached higher levels after this time, most probably due to photosynthesis-related causes. These findings evidence a common signal transduction pathway for ABA and BA for some GS-encoding genes and open new lines of investigation regarding hormonal regulation and nitrogen metabolism in detached leaves.



SlGS genes' expressions analyzed by semi-quantitative RT-PCR

- 16924 | Effects of phytohormones in tomato's Metallothionein's gene expression

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Absciscic acid (ABA) and Benzyladenine (BA) are two phytohormones whose presence in plants is responsible for many physiological processes, essential for the plants survival. Metallothionines (MT) are small cysteine-rich proteins that are known to play an important role in plant oxidative stress responses, especially in cases of heavy metal toxicity due to their metal affinity. In plants, they are arranged in four groups: types 1, 2, 3 and 4 which differ in their Cys-residues distribution and preferred expression profiles. Due to the presence of this metal chelating proteins, and of these two phytohormones, in oxidative-stress situations, this work aimed to achieve a possible relation between them by exposing leaflets from *Solanum lycopersicum* L. to equal concentrations of ABA and BA (0.3 mg/L) for two different times: 30 minutes and 3 hours. Then, the relative MT-encoding mRNAs accumulation was assessed by semi-quantitative RT-PCR. The results showed that MT type 1 expression was positively affected by ABA and the same happened to MT type 4 when exposed to BA.

- 16926 | Antigone, the Last Heir of Cadmus: Blood and Memory in Euripides' "Phoenissae Women"

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Euripides' "Phoenissae Women" was firstly performed ca. 411-409, a period of crisis for Athens for the city had been immerse in a fratricide conflict with Sparta since 431, consecrated historically as the Peloponnesian War. And it is indeed a familial and political legacy of guilt and vengeance, "blood over blood", that defines this tragic account of the mythic tradition related to the royal house of Thebes. The city of the seven gates is built on an a priori condemned foundation: chthonic soldiers, born from the dragon's teeth sowed by Cadmus, are the protagonists of a primitive violence scene, in which earth is nurtured with the blood of its first inhabitants. With the rise (and fall) of Oedipus, saviour and polluter of the city, the primordial affront to Ares continues insolently and yet another narrative of corruption arises, materialised in the new generation: Eteocles, Polyneices, and Antigone. The play presents a sequence of (apparently fragmentary) episodes linked by the accumulation of blame and remorse at the hands of Jocasta and Oedipus and by the struggle of their descendants to overcome the self-destructive curse. Between the two brothers striving for the scepter, we find Antigone, a well-born parthenos whose perpetual confinement to the safety of the palace no longer seems attainable. As she contemplates the military contingent from above, Antigone recognises the imminent shattering of her home (as both oikos and polis) and the impossibility of passivity in a warlike scenario. Therefore, she chooses to reclaim her rightful consequent individuality and, later, enters the battlefield for a fatal confrontation with loss. What can we, as contemporary readers, learn with this Euripidean portrayal of the last heir of Cadmus? Taking Antigone as paradigm to enquire the power of resistance and the unbearable weight of survival after the war, one may read this play as a reflection about the (de)humanisation of war and its impact on the construction of memory.

- **16927 | Grammar laboratories: reflective teaching**

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This project, regarding the conclusion of studies leading to the Master's degree in Portuguese teaching of the third stage and secondary education of mandatory system, by the Faculty of Arts and Humanities of University of Porto, presents the action research project carried out during the period of pedagogical internship, developed at the Aurélia de Sousa Secondary School.

The Native language classroom includes the work devoted to a sequence of communicative and linguistic Portuguese skills. After the two classes of the project being diagnosed with some difficulties in the grammatical competence, it was built an action plan that would meet the pedagogical-didactic needs of the students. With the main goals of promoting metalinguistic reflection and underlining the importance of grammatical knowledge, as an independent component and as a skill articulated with literary reading, this exploratory study proposed the use of the grammar laboratory.

Throughout the execution of this active methodology, the students' intuitive knowledge was a starting point to transform these intuitions into explicit grammatical knowledge. The focus of grammar laboratories is conducted into explicit language knowledge. However, grammar laboratories act as a link between explicit language knowledge and reading of the classics of Portuguese literature.

This action research aims to support the value of investing in teaching grammar, presenting the results of an action plan whose priority was to provide a reflective teaching of grammar. Student conversations were recorded during the grammar lab activities. Their interactions allow us to understand the thinking that guided the responses and evaluate the students' ability to deduce. The results obtained allow to emphasize the importance of grammatical knowledge for literary reading.

Keywords: grammar teaching, metalinguistic reflexion, grammar lab, literary reading, action-research

- **16929 | Ready to Match? College students' perception of Tinder**

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Technology has propelled significant changes in the way we establish social relationships. With the emergence of Internet and the online dating phenomenon, online relationships and intimacy were utterly redrafted to a swift and fleeting process that is predominantly envisioned as something negative, shallow and casual. Albeit dating apps have a dominant presence in young adults' social life, literature on this subject is scarce, namely in Portugal. This study aims to explore the way in which college students envision Tinder, the online dating application, motivations to use it, their experiences on dates arranged through the app, and their perceptions about Tinder based relationships. A mixed approach was adopted, using semi structured interviews (N=3) and an online survey (N=27) with close and open questions. The qualitative data was analyzed according to Braun and Clarke's thematic analysis model, with the support of NVivo11®; quantitative data was analyzed with the support of SPSS 25. Results allow differentiating a passive and active use of Tinder, and show diverse motivations to install and to use the app. Analyses also show the presence of engagement cycles that lead users to repeatedly uninstall and install the app. Participants have concerns such as security issues about the offline date and the use of the app itself. In addition, we found that participants consider Tinder useful to meet new people, believing that a Tinder based relationship is as valid as a normative one. Nevertheless, they demonstrate contradictory opinions about their usage, voicing stereotypes such as the predominance of casual relationships or not admitting they use the app. Globally, this study shows that Tinder is present on college students' lives, presenting a rich first look at this phenomenon.

Key words: Online dating, Tinder, Socialization, College students, Intimacy

- 16930 | A comparative insight into the effects of combined drought and Ni stress between domestic and wild tomato species

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Given the increasing urbanization and climate change-related phenomena, water scarcity and metal contamination are expected to rise in intensity and frequency, significantly impairing agricultural production. Therefore, to meet the growing food demand of an expanding population, research efforts should be reinforced to improve plant productivity under adverse conditions. *Solanum lycopersicum* L., commonly known as tomato plant, is described as susceptible to extreme environmental conditions, including metal toxicity. However, wild tomato species (WTS), native of diverse regions of the planet, can live under hostile conditions, possibly exhibiting higher tolerance to several abiotic stresses. Aiming to unravel the usefulness of WTS as sources of tolerance traits, this work assessed the comparative effects of combined Ni toxicity and drought on the growth and oxidative status between *S. lycopersicum* (domestic) and *S. galapagense* (WTS). For this purpose, plants were grown in a Ni-contaminated (100 mg/kg) soil for 28 d, being the watering withheld for the last 7 d. Results showed that the exposure to 100 mg/kg Ni alone did not severely affect growth, nor the oxidative status [lipid peroxidation and reactive oxygen species (ROS) levels] of *S. lycopersicum* plants, but decreased shoot biomass of *S. galapagense*. Drought caused more harmful effects, reducing the growth of roots and shoots and inducing lipid peroxidation in both species. Under the combined action of Ni and drought, biomass production and root growth were further inhibited. However, for both species, oxidative damages in roots were less evident under the combined exposure than under drought stress alone. Although these results do not seem to validate *S. galapagense* as a higher tolerant species, additional physiological assessments will be performed in order to concretely evaluate the cellular mechanisms responsible for Ni- and drought-induced stress in both species.

- 16932 | “What drives you to buy on impulse?”

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Impulse buying occurs when a consumer experiences a sudden, often powerful and persistent desire to buy something immediately. Findings reveals that an impulse purchase is influenced by a number of internal and external factors. This study aims to identify factors that drives people to buy impulsively. Participated in this study 925 Portuguese (711 females and 213 males), with a mean age of 27.02 years ($SD = 10.73$). Data was obtained through an online questionnaire. The participants read and accepted the informed consent, and the confidentiality of the data and the anonymity of the participants were ensured. Participants were asked to answer the following question "What drives you to buy on impulse?". Responses were analyzed through content analysis. The answers were grouped into eight categories: (1) Internal Factors, (2) Monetary Value, (3) Product Characteristics, (4) Situational Factors, (5) Product Types, (6) Early Engagement, (7) Financial Availability and (8) Social Value. Internal Factors and Monetary Value were the biggest categories highlighted as the main factors that lead people buying on impulse. The results reveal consistency with previous studies.

- 16934 | In vitro study of the granulosa cells response to activated THP-1 derived macrophages

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The immune system responds to the exposure to both endogenous and exogenous stress factors by triggering an inflammatory response, which can be either acute or chronic [1]. Chronic inflammation disrupts and unbalance normal physiological processes, which may affect women's reproductive health at different levels [2]. Granulosa cells (GCs) are predominant cells of the ovarian follicle and contributes to steroidogenesis and follicular fluid composition and thus, they play a crucial role in follicular development and oocyte maturation. However, the impact of inflammation in GCs function and reactive oxygen species generation (ROS) are poorly studied. The aim of this study was to evaluate the effects that inflammatory parameters have on the granulosa cell line COV434 using conditioned medium (CM) from THP1. THP-1 cells were previously differentiated into M1 and M2 macrophages and can be generally categorised into “M1”—pro-inflammatory or “M2”—immunoregulatory. Therefore, COV434 cell viability and cytotoxicity were evaluated, respectively, by MTT assay and LDH release, as well as phase contrast and Giemsa staining cell morphology. Additionally, the presence of COX 2 was analyzed by Western Blot, and the presence of reactive oxygen species (ROS) was evaluated by fluorometric techniques. The results shown a decrease in cell viability in M1-CM by 86.17% (\pm 7.54%); however, the obtained results are not significant. Overall, an increase in LDH release was observed, but these results are also not significant. As for the production of ROS, there was a significant decrease for M1-CM populations by 78.1% (\pm 13.99%), and also an increase in the presence of M2-CM. In the end, macrophages appear to affect granulosa cells, though further studies are needed to conclude in this regard, particularly studies on which inflammatory parameters are involved in these processes.

[1] Weiss, G., et al. Reproductive Sciences, 2009

[2] Jabbour, H. N., et al. Reproduction, 2009

- 16942 | HIGH RESOLUTION IMAGES CLASSIFICATION OF INTERTIDAL ROCKY SHORES

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Remote sensing techniques have been applied for information extraction from low and medium resolution images since the 70s. However, the advance of unmanned aerial vehicles (UAV) demand the study of new methodologies to improve the interpretation of such high resolution images. In the scope of SWUAV project - Mapping the intertidal zone and assessing seaweed biomass using UAV images, the aim of the present study is to compare two supervised classification methodologies for multispectral data: pixel-based and object-based for high-resolution images of an intertidal rocky shore. The images were captured in February 2019, on the rocky coast of Vila Chã. The UAV flew through the study area at 20 m high and was equipped with RGB: and multispectral cameras (resolution: 0.8 cm and 1.6 cm, respectively). All images were orthorectified and in Qgis software the pixel-based supervised classification was applied on the NDVI raster using the Minimum Distance algorithm. The defined training classes were: (1) seaweed; (2) mussels and rock; (3) sand; and (4) rock, barnacles and limpets. The object-based classification was performed in the eCognition® software, preceded by multi-resolution segmentation. The classification considered higher weights for NIR, and RED bands, the NDVI and included above training classes. The pixel-based classification resulted in a noisy image, where a large variability of pixel grey levels generated a salt and pepper effect on the final product. This effect was not observed in the result of the object-based classification. The classifications provided different outputs in terms of area (m²) per class, being the largest difference for seaweed (-88,3%) and the smallest difference for mussels and rock (11,1%). Therefore, further studies will be developed to assess the accuracy of each of those methodologies for mapping the intertidal rocky shores combined with photo-interpretations for its validation.

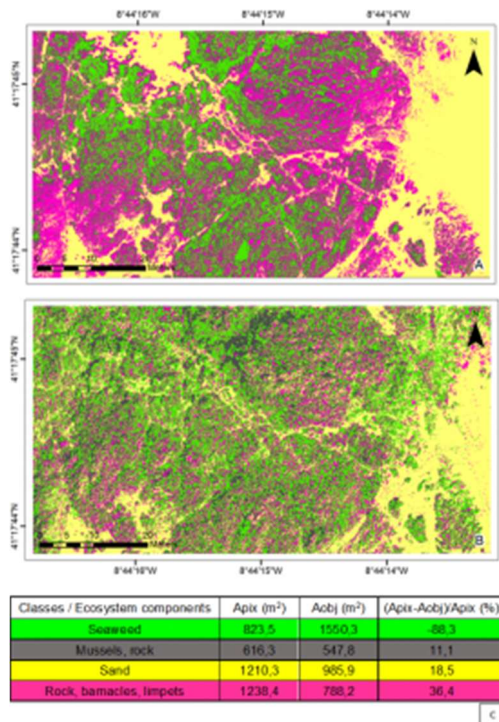


Figure 01: (A) Result of supervised pixel-based classification; (B) Result of supervised object-based classification; (C) Area comparison table, the map colors match the class colors in the table.

- 16945 | Fighting *Helicobacter pylori*: a specific antibiotic-free strategy

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Helicobacter pylori (*Hp*) infection is associated with development of gastric disorders, namely gastric cancer [1]. The available antibiotic therapy fails in ~40% of cases and is not selective, promoting dysbiosis [2,3]. So, a strategy able to kill *Hp* while being "friendly" to gut microbiota, is crucial.

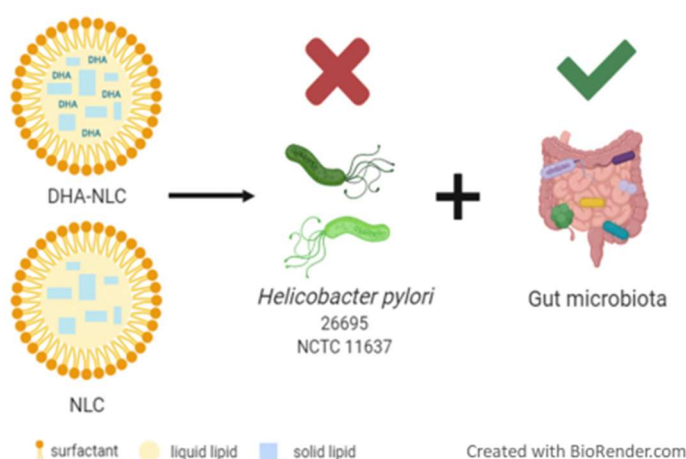
Lipid nanoparticles, namely nanostructured lipid carriers (NLC) and docosahexaenoic acid loaded NLC (DHA-NLC), were effective against a human *Hp* strain (J99) [4,5]. Since gastric infection is characteristically multi-strain, we aimed to establish the nanoparticles effectiveness against other human *Hp* strains (*Hp* ATCC® 26695; *Hp* NCTC 11637). Effect upon normal and dysbiotic gut microbiota, was also evaluated.

They were produced and characterized as previously described by us [4]. *In vitro* activity of nanoparticles was assessed by determination of minimal inhibitory concentration and minimal bactericidal concentration using the microbroth dilution method [6]. Our findings showed that NLC inhibited both *Hp* strains growth at 0.31% v/v and were bactericidal in the 0.31-1.25% v/v range, while DHA-NLC inhibited and killed both strains at 0.31% v/v. These nanoparticles did not harm bacteria from the normal or dysbiotic gut microbiota.

The developed nanoparticles are bactericidal against *Hp* in a specific way since they do not affect other bacteria from gut microbiota. Altogether, this microbiota "friendly" strategy should be considered as an antibiotic-free alternative for gastric infection treatment.

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References: 1. Molnar B., et al., 2010; 2. Malfertheiner P., et al., 2017; 3. Rizzatti G., et al., 2018; 4. Seabra C.L., et al., 2017; 5. Seabra C.L., et al., 2018; 6. Wiegand I., et al., 2008.



Graphical abstract

- **16946 | Marine bromophenol BDDE as a model for the synthesis of new chalcone derivatives with antibiotic synergic effects**

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Macroalgae represent an important class of marine organisms that produce a great diversity of bioactive secondary metabolites [1]. Among these, bromophenols, such as bis(2,3-dibromo-4,5-dihydroxybenzyl)ether (BDDE), have been attracting attention because of reported wide array of biological activities, namely antitumor, antimicrobial, antioxidant and antidiabetic activity [1]. Herein, new brominated chalcone derivatives (19 chalcone derivatives, including 8 chalcones, 6 dihydrochalcones, and 5 diarylpropanes) inspired in BDDE were synthesized and explored for their antimicrobial effects. Chalcones were synthesized by Claisen Schmidt condensation of appropriately substituted acetophenones and benzaldehydes, with yields between 36-87%. The synthesis of dihydrochalcones and diarylpropanes was achieved by catalytic hydrogenation in a H₂ atmosphere with Pd/C and Pd(OH)₂/C, respectively, with yields up to 60%.

All compounds were screened for their antibacterial activity and antibiotic synergy, according to CLSI protocols. The first was performed in susceptible strains of *Staphylococcus aureus*, *Enterococcus faecalis*, *Escherichia coli* and *Pseudomonas aeruginosa*. For the antibiotic synergy assay, resistant strains *E. coli* SA/2, *S. aureus* 66/1 and *E. faecalis* B3/101 were used with cefotaxime, oxacillin, and vancomycin, respectively. Out of the 19 tested compounds, 14 were able to decrease cefotaxime's MIC in *E. coli* SA/2. On the other hand, all tested compounds led to a decrease in vancomycin's MIC in *E. faecalis* B3/101. Future studies will involve insights into their mechanisms of action.

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Acknowledgements:

Strategic Funding UID/Multi/04423/2019, and Projects PTDC/SAUPUB/28736/2017 (POCI-01-0145-FEDER-028736) and CHIRALBIOACTIVE-PI-3RL-IINFACIS-2019, FCT, ERDF, COMPETE, PT2020. F Durães

- 16948 | Impact of exercise training performed during the gestational period in the phenotype of the offsprings

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Regular physical exercise has been considered as a very important non-pharmacological tool that is associate both to the increase in physical fitness of high performance athletes. Particular moments of our lives deserve special approaches regarding exercise prescription features, including women in the gestational period or in the first year after pregnancy.

Based in an animal model study, the aim of the present study was to understand the impact of exercise training performed during the gestational period in the phenotype of the mothers and in several performance related-parameters of the offsprings. For that, 16 female Sprague-Dawley rats were randomly divided in 2 groups (Sedentary pregnant - GS and Exercised pregnant - GE), being the trained animals submitted to an exercise program during 3 weeks. In the same way, 8 animals per group were used to study the impact of the training protocol in the offspring. During the 17 weeks of the experimental protocol, all the animals were submitted to a control diet. GE started the endurance training program in the treadmill after confirmation of the pregnancy and had free access to a running wheel in the cage for 24h/day.

GE exhibited a decreased weight gain throughout the gestational period; however, the number of pups was similar in both groups. Regarding offspring animals, significant differences were found between groups in their weight after birth, in the time to exhaustion and lactate concentrations in the end of a maximal workload test. The training program induced changes in the expression of several proteins related to the cellular metabolism of the pups, namely AMPK, PGC-1 α , TFAM and FNDC5.

Data from the present study suggest that exercise training programs performed throughout the gestational period induces a positive impact on the phenotype of both mothers and pups with particular relevance on physical fitness and health-related parameters.

Keywords: PHYSICAL TRAINING, EXERCISE, PREGNACY, OFFSPRING.

- **16950 | Parameter Analysis on Carotid Transverse Ultrasound Images**

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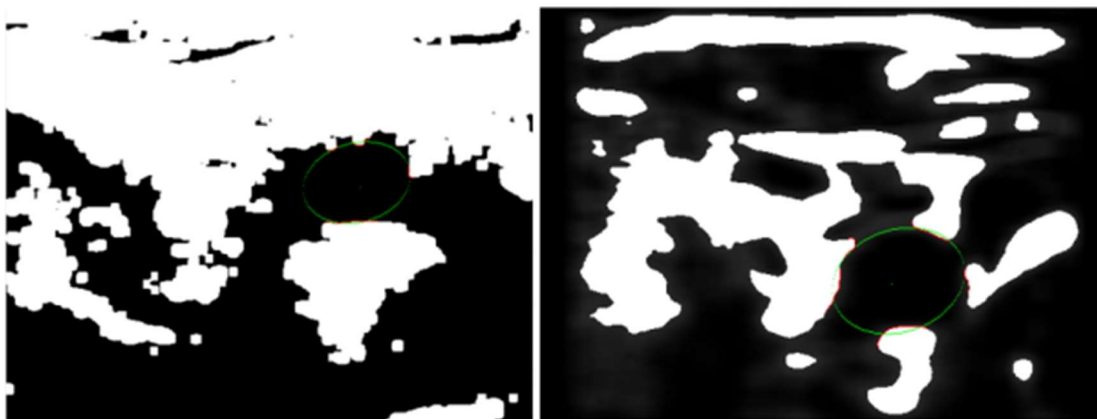
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The study presented here is about the analysis of medical images representing the bifurcation of the carotid artery. The developments in this area are getting favourable results to the medicine, due to cardiovascular diseases being one of the most causes of death in the world. Previous studies refer using automatic methodologies to solve segmentation problems and characterize regions of interest [1]. The main interest of the actual development is to statistically analyse properties and its consistence along the set of bifurcation images. The evaluation of the arterial disease can be done with the ongoing segmentation methodology, since it allows to identify with the best approach the artery aspect. The methodologies were tested for some bifurcation samples, with plaque or artefacts. The analysis researched about the limit value for the total expansion of the black pixels in the binary image and the correlation between the manner how it is presented and the precision of the least square method in the approximation of the region. Some configurations were set to minimize the number of iterations of the method, improving computational time costs. The entropy of the images tends to decrease along the bifurcation, due to the area of lumen detection being bigger and the poorness of the images. The behaviour of the images with poor quality motivates the optimization of the image's analysis, forcing the implemented algorithm to get new values and to iterate. The spline method and Fourier analysis were used to guarantee the veracity of the correct parameter values. Spline method was used to find the most prejudiced centre values and the Fourier analysis was applied to area detection, to know the most trustable value for the luminance.

[1] R. Fitas, C. Castro, L. Sousa, C. António, R. Santos, and E. Azevedo, "Analysis of Sequential Transverse B-Mode Ultrasound Images of the Carotid Artery Bifurcation," 2019, pp. 521-530.



Binary image and circular representation of the artery using least square method approximation. Left: Lumen uncertain location due to lack of side limits. Right: Lumen exact location due to reliable limits on top, bottom and sides.

- **16954 | Novel fish feed supplements: giving value to agroindustrial wastes**

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Sustainable aquaculture requires the reduction of fish meal use in diets, by replacing it with eco-friendly ingredients, as that vegetal feedstuff not desirable for human consumption. However, these pose challenges due to the presence of antinutritional factors. The supplementation with some supplements, like exoenzymes and antioxidants, has shown potential to reduce their nutritional drawbacks. The solid-state fermentation (SSF) of agro-industrial wastes may be used to obtain such compounds. The goal of this work was to test the applicability of an SSF-extract, obtained through the SSF of an optimized mixture of three agro-industrial wastes with *Aspergillus ibericus* (30% EGM, 36% VTS, 34% EOP), determined previously with a simplex-centroid mixture design. The activity of this extract was measured to be xylanase: 1866.9 U/g (lyophilized extract); cellulose: 1563.6 U/g; β -glucosidase: 736.455 U/g, and total antioxidants: 439.4 μ mol Trolox equivalents/g lyophilized extract; total phenols: 28.1 mg caffeic acid equivalents/g lyophilized extract. The efficiency of this extract as a feed additive in plant-based diets evaluated by an in vitro digestibility trial, analyzing its efficiency to improve the release of pentoses and antioxidants during digestion. The extract was used to supplement diets for *Dicentrarchus labrax*, with increasing levels of extract: 0, 4 and 8 U cellulase/g diet. Dietary supplementation with the extract led to the increase of pentose release, during alkaline digestion. The effect of the supplementation with the SSF extract on the release of antioxidants and phenols compounds are being evaluated and will be presented.

Funded by: Project SPO3 (ref. POCI-01-0145-FEDER-030377; FEDER-Operational Programme Competitiveness and Internationalization and FCT); project InovFeed (ref. MAR-02.01.01-FEAMP-0111; Programa Operacional Mar2020); BioTecNorte (NORTE-01-0145-FEDER-000004; ERDF under the scope of Norte2020-Programa Operacional Regional do Norte)

- **16955 | SCHOOL SPACES IN THE INCORPORATION OF (NEW) INFRASTRUCTURAL NEEDS**

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On April 4th, 2006 as a consequence of the Kyoto Protocol, a set of legal acts relating to the Energy Certification and Indoor Air Quality System (SCE), Building Climate Control Energy Systems (RSECE) and the Regulations of the Thermal Behavioral Characteristics of Buildings (RCCTE), revealed concerns and limitations on buildings' energy consumptions. These determinations entailed the need to jointly articulate the various components of buildings that generate energy consumption, leading to a conceptual interdependence between the lighting and HVAC projects. As would later be perceived, these new legal determinations set significant impositions in the incorporation of the spaces of a paraphernalia in the spatial characterization, a major condition in the context of interventions on pre-existing buildings.

In this context, the Program developed by Parque Escolar was the first moment, both in time and impact, in which these consequences were implemented. It was assumed as a laboratory where various methodologies, strategies and consequently results were tested.

As opposed as the traditional sense of concealment of the most expressive infrastructures, the Program, for reasons of maintenance and accessibility, came to determine that most of the design options assume the physical and visual presence of these elements with consequences for the conformation of the spaces in the environments and image. Thus, and given the complexity of the systems, the need to extend the dialogue between technology and architecture was induced, eventually providing new sensitivities in the aesthetic appropriation of spaces, or even configuring a new language. The reflection on this problem is inserted in the research "ESCOLAS: Complexidade e Interpretação", under the coordination of Professor Doctor André Santos.

- 16961 | Fear conditioning: A relationship between callousness and aversive conditioning in children aged 3 to 5 years old

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Callous and unemotional traits along with the presence of behavioral and impulsive problems are considered manifestations of psychopathy traits in children and youth (Pardini, Lochman, & Frick, 2003). Although research shows a robust relationship between psychopathic traits and aversive conditioning deficits in adults, there is no research on this topic in children. This research aims to study the association between the efficacy in establishing associations by aversive conditioning and the manifestation of psychopathic traits in children between 3 and 5 years. Additionally, a possible moderating effect of parenting practices on the relationship between associative learning disabilities and callousness was tested. A quantitative research characterized by a multi-informant approach (parents and kindergarten teachers) involving a total sample of 80 children was conducted. The results suggest that there is agreement between the informants, parents and teachers, on the unemotional and callousness subscales, as well as on the total ICU scale. Regarding the adapted and applied aversive conditioning paradigm, the results confirm that the experimental protocol was effective in inducing a conditioned response in children. No associations were detected between the various subscales of the ICU measure and the results in the aversive conditioning paradigm in the acquisition phase. However, a negative association was found between the total ICU score and the conditioned response in the extinction phase, suggesting that children with higher ICU values extinguish the conditioned responses more effectively. In addition, an interaction between the conditioned response in the extinction phase and poor supervision was detected, suggesting that learning deficits are only associated with the emergence of callous and unemotional traits in children whose parents have poor supervision experiences.

- **16962 | New sulfated coumarin derivative with in vivo oral antithrombotic activity**

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Heparin, which is a polysulfated polysaccharide, is a classic anticoagulant agent with an effective mechanism of action involving several plasmatic factors of the coagulation.¹ Unfortunately, heparin is a heterogeneous product obtained from bovine or porcine sources, active only by parental route.¹ Some coumarins, as warfarin, have been therapeutically used as anticoagulants, with oral bioavailability. Nevertheless, being vitamin K antagonists, coumarins have several interactions with many drugs and food.¹

This work reports a hybridization strategy to develop new anticoagulant agents based on new coumarin derivatives: by adding sulfated saccharides to the coumarin scaffold through click chemistry it was hypothesized the possibility of obtaining new anticoagulant coumarins with an anticoagulant profile similar to heparin however with higher potential to be oral bioavailable. The synthetic pathway involved propargylation, click chemistry, deacetylation, and sulfation. A new derivative was obtained for the first time and fully characterized by IR, ¹H and ¹³C NMR techniques.

The anticoagulant activity of this new synthetic coumarin derivative and three others structurally related coumarins, previously synthesized in our group, was measured ex-vivo in human plasma by the three classical clotting times, activated partial thromboplastin time (APTT), prothrombin time (PT), and thrombin time (TT). The new synthetic coumarin derivative was the most potent compound among the studied coumarins (APTT₂= 200μM). Following, an in vivo study in mice was performed and the weight of the FeCl₃-associated thrombus induced in mice treated with the new synthetic coumarin derivative (intraperitoneally or by oral gavage) was lower than the controls (42% and 33%, respectively, n=5 in each group). Overall, this work shows for the first time sulfated coumarin derivative with in vivo oral antithrombotic activity.

- 16964 | Characterization of Defensive Systems in high-level Handball Teams - Study with recurs to Lag Analysis with teams participating in the 2018 Men's European Championship of Handball

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Pastor (2006), a highly regarded Spanish coach, refers in a conference that it's easy to talk about the attack, the coaches always do that. Although, the coach affirms that more important that score is not concede goals to the other team. Pastor (2006) refers the defense as a cornerstone for the difference between the winning teams and the losing teams.

With the words of Pastor (2006) this work surges as a method to combat the default of works about the Defensive game phase, characterize the Defensive Systems. The sample use 44 games of the 47 games from the 2018 Men's European Championship of Handball and 3420 sequences referred to the Zonal Defense

The data was analyzed through descriptive analysis and lag analysis. The descriptive analysis refers the frequency and efficiency of the Defensive Systems, beyond the possible criteria of success in the defense. The lag analysis defining the Defensive Systems as Criterion Conduct and define for them the patterns of conduct which have the possibility higher than the chance to appear.

Both analyses complete each other, once the possibility to know the frequency and efficiency of the defensive systems correlated to the padrones founded in the lag analysis can explain why the winning teams have a better efficiency than the losing teams.

After the analysis of the data it's possible to present some conclusions: (i) the Defensive System with use are the 6:0, (ii) in the Absolute Numerical Relation 7x7, attack with goalkeeper in the field, the winning teams have the possibility higher than the chance to do faults and induce the passive play warning, (iii) in the Absolute Numerical Relation 7x7, empty goal, the winning teams have the possibility higher than the chance to induct the attack to shot far from the goal, (iv) in the Absolute Numerical Relation 7x6, empty goal, the winning teams have the possibility higher than the chance to present behaviors of dissuasion and anticipation.

- 16965 | BeachSafe: quantification and characterization of *Vibrio parahaemolyticus* in Portuguese bathing waters

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Vibrio parahaemolyticus, a recognized human pathogen responsible for non-cholera *Vibrio* infections - gastroenteritis, wound infections, and septicemia, are autochthonous to coastal waters. Vibriosis outbreaks in bathing areas are on the rise in the Northern Hemisphere, under the ongoing climate change. The monitoring of these emergent microorganisms is not yet mandatory. Monthly water samples were collected from 10 Atlantic beaches (NW Portugal) over a year. Quantification of *V. parahaemolyticus* was performed by the most probable number-polymerase chain reaction (MPN-PCR). Thiosulfate-citrate-bile salts-sucrose agar (TCBS) and Chromoagar *Vibrio* medium were used for the presumptive identification of *V. parahaemolyticus*, and confirmation was made by PCR targeting the *toxR* gene. *V. parahaemolyticus* was always present, with abundances up to 5.64 Log MPN/mL. The higher expression of toxigenic genes occurred during the bathing season. Moreover, those *tlh*, *tdh* and *trh* genes were present in 16, 11, and 6% of the 80 confirmed isolates, respectively. Further identification of differences on the phylogeny among pathogenic isolates was performed by the Enterobacterial Repetitive Intergenic Consensus Polymerase Chain Reaction (ERIC-PCR) approach, revealing high diversity. Moreover, antibiotic susceptibility to 13 antibiotics was also assessed, being most of the isolates resistant to at least 3 antibiotics. B-lactam, aminoglycosides, and macrocyclic antibiotics revealed the highest number of resistant isolates. The results of this study highlighted the unaccounted public health risk for beachgoers, and the dire need for new monitoring and alert tools, in order to guarantee a BeachSafe to users, considering the present climate change process.

This work was funded by the Project BeachSafe (PTDC/SAU-PUB/31291/2017), co-financed by COMPETE 2020, Portugal 2020 and the European Union through the ERDF, and by FCT through national funds.

- 16970 | Induction of bystander effect by different contaminants on soil oligochaetes

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Studies related with radiobiology proved that the genetic damages observed in cells/ tissues exposed to ionizing radiation can be communicated through gap-junction or by diffusion of signals into the medium to other entities not themselves exposed, a process known as radiation induced bystander effect (RIBE). Considerable evidences now prove that this mechanism is observed between organisms and responds to ionizing radiation and to a range of chemotherapeutic drugs, metals and other stressors. The ecological implications of such mechanism are purely understood and there is a lack of knowledge regarding this effect between different taxonomic groups. Moreover, no data for this effect in vivo between terrestrial invertebrates are available so far.

Taking these facts into consideration, this work was firstly design aiming to collect data about the individual genotoxicity of uranium and cadmium in two species of terrestrial oligochaetes (*Eisenia fetida* and *Enchytraeus albidus*). Secondly, we aimed to test the occurrence of bystander signaling between the two species (inter-species bystander effect) in response to metals, proving that this effect is not exclusive to ionizing radiation. The genotoxicity was evaluated using the alkaline comet assay technique. We observed for the first time that earthworms and enchytraeids exposed to cadmium induce bystander effects in non-exposed organisms of a different species, compromising their genetic integrity. Moreover, Cd was a stronger genotoxic agent in comparison to uranium, that was not able to induce a bystander effect between both species of invertebrates. These findings support the idea that the bystander effect is likely related with the genotoxicity of the contaminants and is not exclusive of ionizing radiation. Moreover, these results bring a new insight about the role played by the bystander effect in the terrestrial compartment between different taxonomic groups in response to metals.

- **16972 | Traveling across a Country: Perception and Collective Memory of Territory in Photography**

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This study focuses on the role of photography in the context of Italian territory, comprehended in the last decades in a very broad and comprehensive manner. The Italian territory has undergone many changes during the years of economic boom, these changes did not affect the consolidated city and its historical center in most of the cases, but rather the peripheries and the entire landscape that had continued to remain esthetically until then. In particular, it examined the development of a "movement" which brought together numerous Italian photographers of the post- Second World War, from the 1980s particularly, called "Italian Scuola di paesaggio". While being a non-formalized group, the implications and the impacts that the work of this specific set of photographers introduced, had influenced not only the history of Italian photography but also the perception and use of the photographic image as an apparatus for the reading of the contemporary city, which was often considered confused and contradictory. These photographers were, in fact, the first ones to pioneer the visual representation of the space that would make a part of our collective memory; and to give it form and coherence through photography.

Through the critical analysis of the images of three photographers who worked with different approaches and methods, an assembly of materials are presented at reader's disposal, not only theoretical but also visual. Driven by the desire of providing to the reader a basis of what is represented in the study, the research work is accompanied with exemplary images chosen.

The focus of the final work is therefore not limited to photography per se, but it extends itself to the forms and problems of urban space since photography can answer to these issues as being a tool of critical reflection, capable of mediating adequate solutions to inhabit the contemporary territory.

Key words: Photography, Urban sprawl, Territory, Landscape, Novecento, City image, Italy

- **16973 | Histological and Hemodynamic Characterisation of the Right Ventricle of Sedentary and Trained Animals with Heart Failure With Preserved Ejection Fraction**
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Background: Right ventricular (RV) dysfunction strongly contributes to morbidity and mortality in Heart Failure with Preserved Ejection Fraction (HFpEF). Regular aerobic exercise is becoming highly recognized for its adjuvant role in the management of this syndrome. The underlying physiological mechanisms include both central and peripheral adaptations. Regarding central adaptations, it remains to be shown if exercise is capable to improve RV function in the HFpEF scenario.

Objectives: Characterise the RV changes in a pre-clinical model of HFpEF and evaluate the impact of exercise training (ExT) in the modulation of the RV hemodynamic and histological changes.

Methods: We used ZSF1 lean (n=7; control group) and obese (n=14) rats. Obese rats were randomly allocated to exercise (n=7; low intensity aerobic training protocol, for 5 weeks) or to sedentary group (Sed; n=7). At the end, all animals were submitted to maximal effort test, followed by invasive hemodynamic evaluation of the RV. Histological evaluation was also performed. Analysis of data was first performed using one-way ANOVA, followed by multivariate analysis.

Results: A significant decrease in VO₂max was found in Obese+Sed animals, which was partially reversed by Obese+ExT. Obese+Sed group showed signs of RV overload as well as diastolic dysfunction in baseline conditions, and exercise training prevented these changes. RV overload was positively correlated with diastolic dysfunction and both were negatively correlated with VO₂max. Only Obese+Sed presented significant cardiomyocyte hypertrophy in comparison to the control group. No changes were found in terms of fibrosis.

Conclusions: The ZSF1 rat model of HFpEF developed functional and structural changes in the right ventricle. Our data provides evidence that exercise training prevented these changes, reinforcing the importance of using exercise to improve right ventricle response in HFpEF.

- 16974 | Same contexts, different readings: an analysis of the constructions "por parte de" and "de parte de" in European Portuguese and Brazilian Portuguese
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This research work is an attempt to verify different interpretations of the two portuguese constructions - "de parte de" and "por parte de" - in order to understand under what conditions they may vary in European Portuguese (EP) and Brazilian Portuguese (BP). Since at first glance these constructions seem quite similar, at least regarding the definition that has to do with the responsibility attributed to an entity for something, we also considered that partitive interpretation is available in a number of contexts. Quite superficially, we have tried to understand whether or not the occurrence of these constructions in the same context has different values for the speakers who make up the sample of the two language varieties. The study was applied to a total of 18 informants, 10 native speakers of EP and 8 native speakers of BP, and the results were obtained by applying a survey. The survey consisted in 24 sentences: 12 sentences in EP, taken from the CETEMPúblico corpus, and 12 sentences in BP, taken from the NILC/São Carlos corpus. For examples of both EP and BP, we consider that the absolute contiguity of this type of constructions with common countable singular nouns (e. g., "de parte/ por parte do sector" - Do these constructions always have the same interpretation? Can they have different interpretations?) and plural, singular and plural collective nouns, nouns that designate social, cultural, political or religious organizations and nouns that designate the thematic role of cause (considered only in the case of "por parte de") would be relevant to determine the interpretation given to these constructions. The conclusion that we could draw from this study was that the selected contexts actually motivate the alteration of the interpretation of the sentences with the constructions under analysis and the change of the first preposition of these constructions is determinant for the interpretation of the sentences, mainly for BP speakers.

- **16975 | FURNITURE EVOLUTION AND TRANSFORMATION AT PUBLIC SCHOOL IN PORTUGAL**

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This work is integrated to a research project 1, and aims to understand the evolution of school furniture, from the first primary school built in Portugal in 1866, by the benevolent action of the Count of Ferreira 2, to the latest modernization operation of secondary schools, carried by Parque Escolar. In this context, reasons will be sought, both in the various appropriations of the classroom space, as well as in the way the school furniture can interfere or condition the teaching-learning process.

Two moments of transformation of the classroom paradigm are notorious, the first, the elimination of the teacher's high position, and the second, in 1972, the implementation of the same-sex coeducation regime, and so, favored the conditions for the evolution of furniture, and therefore a greater balance and proximity of the school community.

In addition, it is also important to take into account the moments that are distributed, in a less visible way, throughout the school, such as information support equipment, selective waste collection systems, vending machines and, above all, the spatial contexts characterized by the employees's support furniture scattered throughout the circulation spaces.

In this regard, it's consensual to defend that the quality and relevance of the design and distribution of school furniture, constitutes decisive factors in the cognitive, social and even physical-motor development of the students uses.

The ergonomic condition and versatility are challenges to be integrated in the perspective of its multiple appropriations, providing comfort, being attractive and stimulating new teaching methods, based on the teacher-student approach and interaction. Outdoor furniture should integrate the study in the verification of its appealing conditions in order to contribute to informal learning and playful use.

1- ESCOLAS: Complexidade e Interpretação, under the coordination of Professor Doutor André Santos.

2- Joaquim Ferreira dos Santos (1782-1866).

- 16976 | Effects of high Zn concentrations on *Solanum lycopersicum* L.'s nitrogen and GSH metabolism

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The element zinc, an essential micronutrient, can be toxic to plants at high levels. The aim of this study was to evaluate the response of tomato plants to high levels of zinc at various concentrations and exposure periods, focusing on nitrogen assimilation, reduced glutathione (GSH) production and regeneration. Data was collected on glutamine synthetase (GS) encoding genes mRNA's accumulation and nitrate reductase (NR), glutathione reductase (GR), guaiacol peroxidase (POD) and γ -glutamyl-cysteine synthetase (γ -ECS) activities. An increase in NR's activity in roots accompanied with a decrease in shoots, suggests a strong uptake and assimilation of inorganic nitrogen. In roots, Zn shifted the mode of GSH production by the plant from de novo synthesis to its recycling, as γ -ECS' activity diminished, while GR's increased with the different GS isoenzymes having various behaviors depending on the treatment. In shoots, regarding GSH, its de novo synthesis was not affected by the Zn concentrations supplied, however, its recycling was induced by the shock treatment with Zn and H₂O₂ oxidative stress was intensified by Zn levels in shoots due to a compromised POD activity.

- **16977 | The Experimental Period: Legal Void and (Un)constitutionality?**

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The experimental period has a formal bilateral nature. In this sense, it is not only the employee who's working to prove his value, but also the employer.

Any of the parties, during the experimental period, can waive the contract without prior notice or a just cause, and neither of them withholds the right to compensation.

However, in reality, is evident that this institution could be taking advantage of the employee, almost exclusively, working as an escape valve for the employer who has a broader margin to break the attachment for a certain employee without having to invoke a just motive.

It is exactly during the broad duration of the experimental period that the employee is put into a very precarious situation, especially due to the uncertainty created by this situation, something that goes against article 53 of the Portuguese Constitution.

Taking its duration into consideration, a proportionality check is required. It is according to this belief that we question the constitutionality of the legal rule in 93/2019 Act of September 4th when it comes to the enlargement of the experimental period, from 90 to 180 days, in open-ended contracts of workers looking for their first job and the long term unemployed individuals.

Throughout this paper, we will also ponder the situation that the worker with a fixed-term contract is put into his contract being transformed into an open-ended one (for various reasons).

The main issue consists of an experimental period enlargement also serving the purpose of the worker's dismissal in the new experimental period at the time of the contract transformation.

In opposition to what has been recently defended in ruling no. 03.06.2019 of the Oporto Court of Appeal (cfr. ruling no. 02.02.2005 of the Supreme Court of Justice), we believe that this mechanism is often linked to the abuse of rights (namely *venire contra factum proprium*). Is there (another) legal void in the Portuguese legal system that doesn't protect the employees?

- **16979 | Almond shell bioactive compounds: yield of different extraction conditions**

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Almond shells (AS) are the major by-product, generated in high amounts, in the almond processing. Sustainability has become a challenge and an opportunity to innovate in food manufacturing and processing. It is emergent to explore sustainable methods of extraction of bioactive compounds, answering to the economy circular principles, namely in what concerns to agro food industry (1).

The aim of this study was to compare sustainable extraction methods to obtain the bioactive compounds from AS.

The samples were obtained in Trás-os-Montes (Portugal) provided by an almond processing industry. Samples with 3 different sizes were used: industrial broken shell, partially milled shell and powdered shell. For the bioactive compounds extraction two solvents were used: water (100%) and an hydroalcoholic solvent (ethanol:water; 1:1). The samples were macerated for 6 hours using different temperatures: 40 and 60 °C. Then the extracts were filtered and the total phenolic compounds determined by a spectrophotometric method (2).

The powdered shell macerated at 60 °C with ethanol:water; 1:1 presented the highest yield of bioactive compounds.

A simple, eco-friendly and low-cost process allowed the recovery of the bioactive compounds from AS. It is expected that the obtained extracts may have potential applications in several industries such as food.

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- 16981 | Restoration War and Post-War. Relations between Central Power and Local Power. The example of Oporto (1640-1683).

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This work pursues to understand if the relations between the Crown and the Oporto city council changed with and between the Portuguese Restoration War and the post-war (1640-1683). The history and chronology of the relations between these two types of powers are still very undefined. This statement is particularly true in the Restoration period, that is presented by some historians as a return to the traditional forms of government, after the attempts of the Philippine Dynasty administration of some centralization, but also by others as a possible turning point in the relations between the Crown and cities, when the House of Braganza seeks to gain more control.

Using Oporto would be a good example to understand these kind of relations. First of all, it was one of the biggest cities in the kingdom, but unlike Lisbon, it was far away from the Court and its political factions, in a certain way featuring a case study of a relative autonomous local power. Besides that, there are studies about the city council for the Philippine period, making possible to trace a chronology of the relations between Oporto city council and the Crown for the whole 17th century and consequently helping tracing the history of the relations of Central and Local Power. Using sources like city council records, correspondence and other historiographical studies, this work focus on three aspects to reach its conclusion: the subjects that were discussed between the city council and the king, the agents involved in the communication between both powers and specific cases of conflict and the reason behind them.

Even if this work is specific to a time period and space it would be a contribute for a comparison with other Portuguese cities and villages, showcasing the history and chronology of the relations between these powers during the Restoration of Independence.

- 16983 | Written records of Porto student movement during the later years of dictatorship - working with archives.

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The project "Porto student movements in the dictatorship - documental archives" aims to collect, preserve, analyze and, in the future, to provide public access to a documents archive produced by the student movement of Porto, between 1969-1974. This project is being developed since October 2019, under the Program of initiation to scientific research for students of the 1st cycle of the Faculty of Psychology and Educational Sciences of the University of Porto.

This communication aims to discuss the process of organization, treatment and digitalization of written records produced by student structures in Porto during the period above mentioned, as well as the creation of a database and the production of a chronology of events.

From an archive of over 1000 documents, the work under way aims at its digitization, analysis and insertion in the database, considering a categorization process that includes, among other dimensions, authorship, date, type of document, educational claims, referenced names.

We aim to reflect on the importance of the written records produced by these structures for the history of the student movement, and of the University of Porto itself, as well as the potential of the work of collecting, processing and preserving documents referring to the Portuguese dictatorship period to enlighten less known aspects of this historical period.

At the same time, we intend to describe the developed tasks by reflecting on how the involvement of 1st cycle students in research projects contributes to a broad and heterogeneous academic experience, allowing to build individualized professional profiles and to develop research skills common to different thematic and scientific areas.

- 16987 | The action of long-term Tamoxifen therapy in different neuronal populations of the Hippocampal Formation

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The Hippocampal Formation (HF) plays an important role in cognitive function and, particularly, in the consolidation of information from short- to long-term memory, and expresses estrogen receptors (ERs) abundantly, which can be a target of endocrine modulation mediated by estradiol. Moreover, this action also modulates the neuronal plasticity and neuroprotection, as well as some intracellular signaling pathways and the release of several neurotransmitters and neurotrophic factors. It is known that in the female rat, these estradiol-dependent structural and physiological changes will promote enhanced learning and memory.

Breast cancer (BC) is the most common form of cancer in several European countries being responsible for a high rate of morbidity and death. Tamoxifen (TAM) is a potent nonsteroidal anti-estrogenic agent that has been used for decades in the treatment of estrogen-responsive BC and as a preventive agent in the development of the disease. Although TAM therapy is by far the best treatment for ER-positive BC, it is still accompanied by a wide spectrum of side effects, some of them associated with impaired cognitive performance. As a selective ER modulator, its action may facilitate or inhibit estradiol-dependent responses and constrain the steroid hormone action on cognitive processes.

With this study, we analyzed the effect of long-term TAM therapy on the hippocampal-dependent learning and memory mechanisms by determining the impact of this drug in the neuronal and physiological response mediated by the HF.

To achieve these goals, young adult cycling female Wistar rats were used as animal model of long-term TAM administration. The effects of TAM in the biochemistry of GABAergic and neuropeptidergic neuronal populations were evaluated in neurons of the HF and correlated with behavioral changes, which showed an increased number of inhibitory inputs to the pyramidal neurons in the HF and an estrogenic action of TAM in the expression of specific proteins.

- **16991 | Autonomic Stress during Plateau Waves in patients with Traumatic Brain Injury**

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The onset of intracranial hypertension in patients with Traumatic Brain Injury is a serious complication that can lead to brain death. Increased intracranial pressure during Plateau Waves (PW) is associated with intense systemic stress response evidenced by heart rate variability (HRV) as a surrogate of autonomic dysfunction.

HRV series analysis show long memory and dynamical complexity as intrinsic characteristics, having been considered in this study by a parametric approach using autoregressive fractional integrated (ARFI) models [1]. Recently, to evaluate the dynamical complexity under multiple temporal scales, multiscale linear entropy (LMSE) was introduced. This approach explores the formulation of state spaces and allows the simultaneous incorporation of short-term dynamics and long-range correlations through ARFI modeling [2].

In this study we confirm that the use of complex methods, such as the assessment of long-range correlations and dynamic multiscale analysis are effective to describe observed effects during the PW. These methods have shown that HRV mirrors the cerebrovascular phenomena and thus this original study supports the clinical suspicion that PW is associated with autonomic stress [3].

Work regarding Celestino Amado Master of Science Thesis, December 2019. Supported by CMUP, UID/MAT/00144/2019, funded by FCT (Portugal), (MEC, FEDER), under PT2020.

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- 16992 | Increment of the level of difficulty throughout the exam items: do students fail more in the last questions?

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Introduction: Students usually answer exam questions according to the sequence in which they are presented. Therefore, it's expectable, as the stipulated time for the exam passes, for the students performance to change according to various factors, such as growing anxiety, decreased time, fatigue, etc. With this study we aim to find out if such difference really exists and what are the possible causes behind it.

Methods: In order to accomplish that we conducted cross-sectional study of data collected retrospectively on 264 SPOP examinations applied to FMUP students in 2018/2019. The difficulty and discrimination index were calculated according to the Classical Theory of Tests (CCT). The association between the ranking of questions and each parameter of CTT was estimated using regression coefficients.

Results: The regression coefficient of the difficulty index with the ranking was -0.00087 (95% CI: [-0.0026;0.00082]). When adjusted for versions, the beta obtained was exactly the same and when adjusted for versions and type of question, the beta was -0.0026 (95% CI: [-0.0052;-0.000011]). Regarding the discrimination index, the regression coefficient with ranking was 0.00014 (95% CI: [-0.00076;0.00105]). The same result was achieved with adjust for versions. The value of beta adjusted for versions and type of question was 0.00011 (95% CI: [-0.00138;0.00159]).

Conclusions: The difficulty of questions increased along with the sequence of the test, since the difficulty index decreased significantly from one question to another. The ranking of the questions did have no effect on discrimination index.

- **16996 | Design of a grinding mill – sizing parameters calculation**

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The main objective of this work is the development of a smart calculation tool for the determination of the main sizing parameters of grinding equipment, using fundamental grinding equations and integrating data from mill manufacturers.

During the mining cycle, the increase in the throughput rate of a mineral processing plant would generate significant capital savings for the company. According to this, equipment design must be well evaluated during the conception stage or when plant capacity is increased by adding new equipment. As milling is one of the most important and costly operations during the mineral processing cycle, its design must be effective. Suitable software can be developed to support the choice of the most appropriate milling equipment, according to the profits and productivity desired by the company.

In this work, the main output was a calculation tool for the determination of the mill sizing parameters, following a methodology proposed by Beraldo [2]. The user is allowed to introduce initial data as capacity, initial particle size and the desired particle size distribution and ore work index. Then, the algorithm, created using python, presents the ideal sizing parameters for each specific case. These parameters are cross-checked with the data collected from the manufacturer's catalogs to select the most appropriate milling equipment.

The developed algorithm would be a valuable tool for milling equipment design. Although further work must be carried out to verify its applicability, it was concluded that the developed calculation tool allowed for a quick and effective determination of the most important parameters during the desing of a grinding mill.

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- **16997 | Technological approach for application of anthocyanins in the cosmetic industry**

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Nowadays, the new market trends reveal a growing interest in natural products over synthetic ones, namely in the cosmetic and textile industries.

Anthocyanins are polyphenols arising from plant secondary metabolism that display many bioactive properties, such as antimicrobial, wound healing and chemopreventive activities.[1] The ability to prevent oxidative damages led to the incorporation of natural bioactives in lotions and facial creams to prevent skin diseases and premature ageing.[2] These characteristics make anthocyanins potential novel compounds for cosmetic formulations. However, they present low solubility in lipophilic media, compromising their application.

In this work, anthocyanins from industrial wastes were recycled and used in their genuine forms. Direct immobilization of the anthocyanins on textile substrates was then performed, to improve their solubility in lipophilic systems. The effect of anthocyanins on the activity of some key skin enzymes (collagenase, elastase, tyrosinase and hyaluronidase) was evaluated to understand the ability of these compounds on preventing wrinkle formation.

Their biological activities were assessed by using keratinocytes and fibroblasts cell lines. Wound healing assays were also performed to analyze the effect of the compounds towards skin care. The obtained results indicate that the use of anthocyanins to prevent skin aging in cosmetic formulations or functional textiles is quite promising.

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Acknowledgements: CR and HO acknowledge their financial support (PTDC/QUI-OUT/29013/2017) with financial support from FCT/MEC and co-financed by FEDER, under the Partnership Agreement PT2020 (UID/QUI/50006/2019, POCI/01/0145/FEDER/007265). IF, JO, CP and TVP acknowledge their FCT contracts (SFRH/BPD/86173/2012, IF/00225/2015, IF/01080/2015, PTDC/CTM-TEX/31271/2017).

- **17000 | PSP Agents: Needs and Proposal of an Ethico-Deontological Training Plan**
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The aim of this study is to outline a continuous training programme in a behavioural scope, with a focus on the ethical-deontological domain, destined for active public safety agents (PSP). More specifically, is intended to be understood what the gaps and necessities in the professional training of these agents are, by exploring aspects linked to their basic training, such as their curriculum, associated perceptions, and transfer indicators for the work context; identifying real life situations in which the officials deem, or have deemed, appropriate to apply their knowledge of ethics; and to understand how these agents think and make decisions when confronted with ethically sensitive professional situations. This study consists in an investigation of qualitative, non-experimental, and transversal nature, with an exploratory and descriptive profile. The data was collected through an online survey, answered by 43 elements of the police force, and through a semi-structured interview with the head of the police officers labour union, as well as a representative of the deontology and discipline department of the PSP. The obtained results allowed us to conclude that the basic training of PSP agents, in the ethical-deontological domain, seems to be insufficient, non-continuous, or posteriorly reinforced.

It is fundamental that the actions of the proposed training programme promote the awareness of police officers regarding the ethical sensibilities inherent to their condition, in order to stimulate professional conducts with strong foundations in a broader spectre of principles and in accordance with the current acting imperatives of respect for human rights.

Key words: Ethical-deontological training; PSP agents.

- 17005 | Trabia Reloaded – Reactivation of the waterfront and the territorial system

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The purpose of this thesis - followed by Prof. Maurizio Carta, University of Palermo - is the urban regeneration of the territory of Trabia and the hamlet of San Nicola l'Arena (Palermo, Italy). The project is the occasion that defines the future starting with the analysis of invariants and conditioners that structure this place. The thesis also wants to provide a methodology to be followed for new transformation processes, taking into account the essential characteristics of the place, such as its tourist vocation and medlar cultivation. The method used is the "Cityforming protocol", developed by Maurizio Carta. This leads to a redefinition of the main role of the coast and of the relationship recovered between the sea and the city. The waterfront between Ficcarazzi and Trabia contains of all the dynamics and characteristics that are common in the Sicilian coasts, especially in the anthropized coasts. This stretch, physically inhomogeneous (there are rocky and sandy beaches), has the same characteristics about the settlement.

There is in fact a clear break between the waterfront and the cities next to it, caused by the housing system that develops along the coast. This caesura is made worst by the infrastructure system. This, together with the lack of dialogue between local authorities, led to the privatization of the coast, which is now almost completely inaccessible. The accesses are cramped and they are not always easily recognizable. They just are the result of interstices between the houses built between the Fifties and Seventies along the waterfront. The increasing privatization of the area has resulted in the total absence of functions related to the use of the coast making it the property of a few private individuals. The lack of a relationship with the waterfront has the consequence of the clear separation between the urban system and all the elements that shape the local historical-artistic heritage, a patrimony that is largely present along the coast.

- **17006 | Bismuth Ferrite Nanoparticles for Radiation Protection: Preparation and Characterization**

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Since the beginning of the Nanotechnology Era, ferrite nanomaterials constitute an interesting group of nanosize materials due to their remarkable magnetic, electric and optical properties.(1) Within this group, bismuth ferrite nanoparticles (NPs) are included, that can present three different structures: perovskite (BiFeO_3), mullite ($\text{Bi}_2\text{Fe}_4\text{O}_9$) and sillenite ($\text{Bi}_{25}\text{FeO}_{40}$). These structures exhibit magnetic and electric properties, which allow their use on several applications, such as sensors, information storage, organic pollutants degradation and production of X-ray radiation protection textiles.(2) This last application, related with the safety of society, is of special importance due to the large amount of radiation that professionals of medical radiology, telecommunications, among others, are exposed everyday.(3)

The main goal of this work was the preparation of bismuth ferrites NPs by a modified co-precipitation method, through the variation of the pH, temperature and reaction time. The nanomaterials were successfully prepared and characterized by several characterization techniques. X-ray diffraction confirmed their crystalline nature, while in the Fourier transform infrared spectra it was possible to detect the characteristic bands associated with Fe-O and Bi-O stretching at 844 and 806 cm^{-1} , respectively. These nanomaterials are promising for future fabrication of radiation protection textiles.

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- **17008 | INTERNATIONAL WORKERS DRINKING ABROAD? EXAMINING THE MOTIVES FOR ALCOHOL CONSUMPTION AND ITS CONSEQUENCES**

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This investigation has the purpose of examining the motives for alcohol consumption by international workers, the contexts associated with such consumption and the consequences that it may have on perceived stress, general satisfaction, performance and withdrawal intentions. Data was collected through an online survey aimed at international workers, resulting in a sample of 204 respondents, spread across 40 different host countries. The results of this investigation indicate that social motives are those that most often lead international workers to alcohol consumption. Drinking with mixed-sex friends and drinking in bars are the most common consumption contexts among international workers, although the participants reported a lower consumption when compared to their consumption before the assignment. The results show that the alcohol consumption is a positive predictor of the assignment withdrawal intentions but is not a predictor of self-reported performance nor overall satisfaction with the assignment. This study is, as of today, one of the first to analyze the reasons for alcohol consumption by international workers, as well as the contexts in which that consumption may occur and the consequences that it may have.

Keywords: International workers, alcohol consumption, perceived stress level, general satisfaction, performance, withdrawal intentions.

- 17012 | ASSESSING ANTIMICROBIAL POTENTIAL OF AGROINDUSTRIAL BYPRODUCTS' EXTRACTS PRODUCED THROUGH SOLID STATE FERMENTATION IN MARINE FISH

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Sustainability is definitely the 21st century word. The future global food provision is dependent on fish and on sustainable expansion of aquaculture production. For that, alternative nutritional strategies for aquaculture disease management are required, reducing the use of synthetic drugs. Agroindustrial byproducts(brewery, winery and olive oil industry) constitute a circular and ecofriendly potential source of add-value bioactive compounds. Solid state fermentation(SSF) is a biotechnological low cost process that may be applied to these byproducts to effectively increase bioavailability of their bioactive compounds and so their antimicrobial potential against fish pathogens. The aim of this study was to evaluate antibacterial properties of agroindustry(beer, wine and oil processing industries) byproducts' extracts produced through SSF with *Aspergillus ibericus*. For that purpose, brewers spent grains(BSG), crude and exhausted olive pomace(COP and EOP), exhausted grape marc(EGM), exhausted vine trimming(VTS) and a simplex-centroid optimized mixture of three agro-industrial byproducts(30%EGM, 36%VTS and 34%EOP), were fermented by *A. ibericus* MUM 03.49. Fermented and unfermented matrixes were extracted with water. To address antimicrobial potential of the extracts a broad spectrum bioanalysis constituted by spot analysis, well-diffusion assays, and fluorescence microscopy was performed against high incidence fish pathogens in aquaculture.

Results in Table 1 confirmed that unfermented optimized mixture extract is effective against *Aeromonas salmonicida* and *Vibrio vulnificus*, while fermented optimized mixture inhibits *Streptococcus iniae*.

Further analysis are being conducted to test potential of these extracts against other important pathogenic bacteria from *Aeromonas*, *Edwardsiella*, *Photobacterium*, *Shigella*, *Vibrio*, *Staphylococcus* and *Streptococcus* genera.

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Table 1- Antimicrobial activity of 200mg/ml unfermented and fermented optimized mixture (solubilized both in H₂O or 10% DMSO) against *Aeromonas salmonicida*, *Vibrio vulnificus*, *Streptococcus iniae*. Tests were done using 100µL of extract solution in a well-diffusion bioassay, with results considered positive if a growth-inhibition halo was observed within 24 hours at optimal conditions for each bacterial growth.

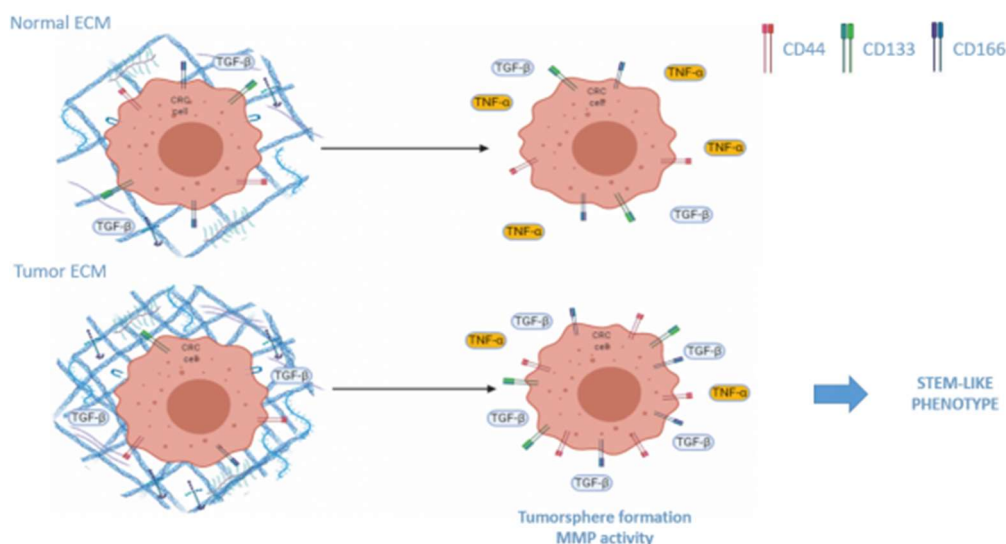
	Unfermented Optimized Mixture	Fermented Optimized Mixture
<i>Aeromonas salmonicida</i>	+	-
<i>Vibrio vulnificus</i>	+	-
<i>Streptococcus iniae</i>	-	+

- 17013 | Effect of normal and tumor extracellular matrices in cancer stem cell-like properties

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Colorectal cancer is one of the most common types of cancer worldwide and the second leading cause of cancer-related deaths. To improve conventional diagnosis and treatment, not only cancer cells but also other elements of the tumor microenvironment (extracellular matrix, immune cells, epithelial cells, cancer stem cells, fibroblasts) need to be considered. The ECM is a dynamic macromolecular structure that provides mechanical support to tissues and has been recognized as a crucial modulator of cell behavior. In CRC, the ECM is remodeled and reorganized, presenting biochemical and biomechanical modifications that increase tissue stiffness and impact on cellular differentiation, invasion, and sustention of the CSC niche. CSC represent a small subpopulation of cells with the ability to self-renewal and clonal tumor initiation. Although it is accepted that the ECM has an important role in the stemness of cancer cells, its role in CRC stem cells remains to be elucidated.

Therefore, the main objective of this work was to evaluate the impact of normal and tumor ECM on CRC cell stem-like properties and disclose potential mechanisms involved in this process. For that, normal and tumor tissues, derived from CRC patients, were decellularized and repopulated with CRC cell lines (HCT-15 or HT-29). Cells were then analyzed regarding their stemness surface markers, genetic expression of EMT- and stemness-related genes and production of stem-associated factors. Tumor matrices induced a significant increase in the expression of the currently used CSC markers CD44, CD166 and CD133. Furthermore, we showed that cells cultured on tumor ECM secrete higher levels of TGF- β , lower levels of TNF- α and enhanced MMP proteolytic activity. This work demonstrated that the tumor extracellular matrix influences stem-like features of CRC cells, suggesting that this component of the tumor microenvironment has a role in the promotion/maintenance of the CSC niche in this type of cancer.



Effect of tumor ECM on CRC cells stemness features

- 17017 | Information management in heritage projects using BIM - Inspection, diagnosis and experimental tests

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During the last decade, the rehabilitation of old buildings has received more attention due to their heritage and social values. Besides the growth of importance in rehabilitation of existing buildings, the construction sector has been changing the way information is managed in its processes by incorporating Building Information Modelling (BIM). Despite the popularity of this technology, there is a lack of documentation covering the implementation of BIM in the rehabilitation projects compared to new buildings, even though it is believed that the benefits of BIM will have a greater impact at the end of the building lifecycle. In this paper, BIM is incorporated as an information management tool to support the rehabilitation project of old buildings, a work developed with the company NCREP - Consultancy and Rehabilitation of Built Heritage, Ltd. The data from the tests carried out in the buildings during inspection and diagnosis actions is previously standardized, stored and exchanged in different applications in order to be represented in a modern model. This model is used to document anomalies and defects in existing buildings, as well as systematizing the collection and storage of information in a damage map of the building. Significant benefits result from the implementation of this methodology at the initial phase of Rehabilitation projects, in particular of the Inspection and Diagnostic actions. For instance, it improves the organization of the information attached to the model, whilst the damage extension in the building can be measured with the results of tests performed. Furthermore, the advantages of applying the methodology are not limited to the initial phase of the project. Indeed, additional benefits can be expected in the later phases, namely when managing and monitoring the state of conservation of the buildings after the rehabilitation works have been performed, as well as supporting building maintenance during the operations stage.

- 17018 | Post-synthetic treatment to improve oxidative desulfurization performance of the metal-organic framework UiO-66

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Oxidative desulfurization (ODS) is a promising sustainable and cost-effective method for the deep desulfurization of diesel fuel, necessary to lower the emission of sulfur which results from its combustion. Along our research efforts on functional materials, we have been developing novel catalytic systems for efficient ODS processes based on Metal-Organic Frameworks (MOFs) and MOF derived materials as active heterogeneous catalysts. MOFs are highly organized coordination polymers that are often crystalline and porous, characterized by their interesting properties, high stability and potential for several applications. UiO-66(M) is a robust MOF based on $M_6O_4(OH)_4(CO_2)_{12}$ (M: Zr or Hf) secondary building units, which is an active catalyst in ODS reactions.[1]

Using economical preparative methods, active catalysts were achieved following solvothermal and microwave-assisted synthesis, which enabled the preparation of MOFs after only 15 minutes of reaction. High catalytic efficiency was found for the prepared MOFs, ensuring near total desulfurization of model diesels and relevant results for real diesel samples after few hours, under sustainable conditions.[2] To promote their recyclability, we developed a novel activation process, enhancing their potential for ODS catalytic systems. To further the scope of our observations, we followed these with activation experiments of other MOFs.

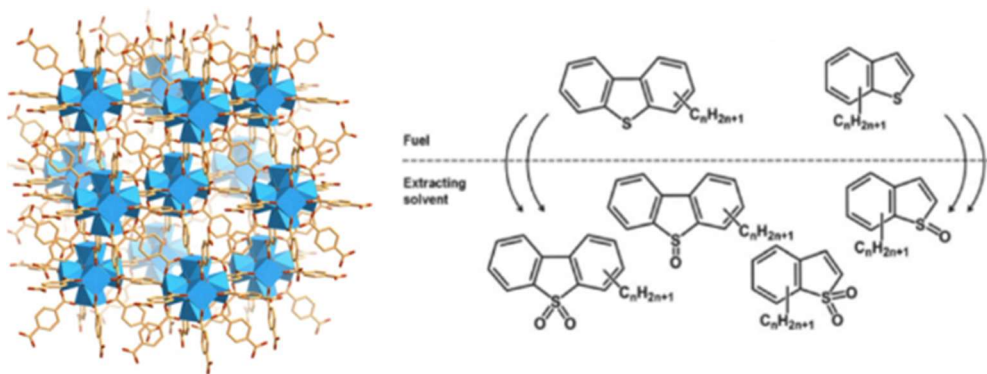
Acknowledgements

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3D framework of UiO-66(M) (left) and an illustrative scheme of an ODS process (right).

- **17019 | Aesthetics Boosting Ethics: Painting as a Medium**

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This article intends to address the way in which we view and understand nature alters our conception of what surrounds us and our actions towards it. Following this framework, nature is in this context understood as a set of pulsating living organisms that manifest themselves in the human being through the sensory experience that he obtains in relation to her. Here Aesthetics is often found as a driver of Ethics and can be seen as a strong argument for the preservation of nature, contributing to the construction of an ethical speech that will privilege ecological values.

This research starts from the refutation of some of the ideas defended Maria Varandas's Ph.D thesis "A Natureza Solo de Conjunção da Ética e da Estética. Fundamentos para a perspetivação do valor estético da natureza na acção ambiental". (Varandas, 2014) In her thesis, the author confines painting to a picturesque idea, stating that the experience of the involvement between the subject and the artwork is not as strong as the experience between the immersed subject and nature. Varandas writes in some parts of her text as if the artist were not susceptible / sensitive enough to appreciate the intrinsic beauty and sublimity of nature and only wanted to portray something according to rules of composition, light / shadow and form. As if he painted only something that respects these patterns. Using Arnold Berleant's (1932-) aesthetics of engagement and the practical example of painters Onya McCausland (1971-), Regina Ramos (1992-) and Jacek Tylicki (1951-), we will attempt to demonstrate that the artistic practice of Painting that has a relationship with nature as a creative source is not limited to such paradigms. Just as I also have a relevant role in the ethical awakening of our actions towards nature.

Keywords: Painting; Aesthetics; Experience; Berleant; Nature

- 17020 | How do taper change young swimmers performance?

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The taper period has the aim of optimizing sports performance. Several metabolic changes occur during this training phase, but information regarding the dimension of change in young swimmers is scarce comparing to adult swimmers. The aim of this study is to evaluate the effect of the taper on the 25 m intracycle velocity profile of young swimmers. Twenty young competitive swimmers (12.8 ± 1.1 years old, 48.0 ± 8.5 kg and 159.1 ± 10.8 cm) performed 25 m front crawl attached to an electromechanical speedometer before and after a one-week taper. Post effort blood lactate concentration was determined after each 25 m (Lactate Pro, Arkay, Inc). Through the instantaneous velocity curves corresponding to the total effort time, maximal impulsion velocity, impulsion velocity decay (Islope), maximal and mean velocities of the underwater swim, maximal and mean swimming velocity, fatigue index, swimming velocity decay, variation coefficient of velocity and the total number of cycles swam were calculated. To compare the differences between the pre and post-taper variables, a Student's t-test of repeated measures was used. Time duration of the 25 m swim (pre taper: 17.91 ± 1.69 s; post taper: 17.90 ± 2.18 s, $p=0.976$) and post effort blood lactate (pre taper: 4.92 ± 0.85 mmol.l⁻¹; post taper: 4.77 ± 1.80 mmol.l⁻¹, $p=0.780$) did not differ with taper. Differences were only observed between the pre and post taper Islope (-1.19 ± 0.94 m.s⁻¹ vs. -0.52 ± 0.21 m.s⁻¹, $p=0.016$). We may conclude that the one-week taper did not improve the performance, which could be due to its short duration or unspecific content. Since recent literature on adult swimmers suggests taper durations not lower than two weeks, further studies should analyse the effects of longer taper periods and control its content to better understand how to improve young swimmers performance.

- 17021 | Implementing and validating an Extracellular Vesicle isolation protocol for the detection of clinically established leukaemia associated immunophenotypic markers in the blood plasma of Acute Myeloid Leukaemia patients

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Acute myeloid leukaemia (AML) is an hematopoietic stem cell disorder with a poor 5-year survival rate and relapse occurs due to the presence of undetected residual amounts of leukemic cells by microscopic assessment. Monitoring this measurable residual disease(MRD) by sensitive molecular techniques allows the identification of patients who are at risk for an early relapse. Many different leukaemia associated immunophenotypic protein markers(LAIPs) are presently useful to detect MRD. Their analysis requires invasive bone marrow aspirates, thus severely hindering real-time monitoring of the disease. Thus, the identification of innovative liquid biopsy-based biomarkers of MRD in patients' peripheral blood(PB) would allow minimally-invasive monitoring of MRD. Recently, Extracellular Vesicles(EVs) have been recognized as a potential source of cancer biomarkers.

Here we sought to implement and validate an EV isolation protocol using the PB of 5 AML patients, in order to perform a comprehensive characterization of LAIPs in the AML patients' circulating EVs throughout the different stages of the disease. For that, Poor Platelet Plasma constituents were resolved by size, using a size-exclusion chromatography(SEC), and further concentrated by Ultrafiltration. EVs were characterized accordingly to their size, concentration(NTA), morphology(TEM) and protein content(WB). Some LAIPs present in EVs were analyzed by Western Blot following protein extraction.

This two-step protocol allowed the isolation of intact and size-resolved EVs from the PB of AML patients. Isolated EVs had a size ranging from 50nm to 300nm, were highly abundant and expressed EV-associated protein markers such as CD63 and HSP70. Importantly, several LAIPs were identified in these patients' circulating EVs. Taken together, a two-step protocol was implemented for the isolation of EVs from the PB plasma and several EV-associated LAIPs were monitored in the blood of AML patients throughout distinct stages of the disease.

- 17022 | The importance of TERT promoter molecular status in the disease management of metastatic cutaneous melanoma

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Melanoma, the rarest and most aggressive type of skin cancer, is believed to arise from the accumulation of genetic and molecular alterations in melanocytes. Telomerase (TERT) is a ribonucleoprotein complex that synthesizes telomeric DNA, responsible for maintaining telomere length, and its reactivation is a widespread feature of neoplasms. TERT promoter mutations were found to have an independent relation with prognosis and might have an important role in classifying patients in risk categories for aggressive disease, which remains very resistant to treatment.

This study aims at characterizing the genetic status of TERT promoter in a series of cutaneous melanoma composed by primary tumours, metastatic nodes and distant metastases, associating potential alterations to clinicopathological features.

We assessed TERT promoter mutations in 100 cases diagnosed between 1997 and 2018 at Hospital Distrital de Santarém. The cases were re-evaluated and staged according to AJCC guidelines. The DNA was extracted and submitted to PCR for TERT promoter and sequenced using the Sanger method. In the cases where BRAF information was not included in the clinical report, BRAF molecular status was also assessed.

TERT promoter mutations were more frequently found in nodular and superficial spreading melanoma subtypes and associated with worst prognosis features. Patients with tumours harbouring TERT mutations displayed reduced survival, and there seemed to exist an association with BRAF V600 mutation. TERT promoter mutational status in some primary samples was different from non-primary tumours' status in some metastasized patients. This clonal heterogeneity might be important in the prognosis assessment.

Our results suggest that TERT promoter mutations play a role in melanoma progression and seem to be associated with the presence of BRAF V600 mutations. This work also lay the groundwork for studying clonal heterogeneity as a potential indicator of prognosis and response to therapy.

- 17023 | Simulation of a Crushing Circuit followed by a screening stage to optimize its final production

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The equipment applied in the crushing stages has been carefully studied during the last years. A series of statistical correlations were used to develop appropriate mathematical models that can be used to accurately describe the crushing event, applied as an individual process, or included in a more complex diagram. Such models aim to perform a variety of simulations close to the ideal and / or real conditions using computational tools.

In the mining industry, the size reduction stage starts immediately after the rock extraction phase. Due to the characteristics of the mining operation, the material extracted from the mine is composed of a larger particle size range. These conditions were simulated at laboratory scale, allowing for the application of the mentioned comminution model. Thus, coarse grained samples were crushed using a pilot-scale jaw crusher. The particle size distributions of the feed and crushed product were determined using a traditional size-analysis process. Both particle size distributions were used to define the parameters of the applied mathematical model, which means that it is crucial to ensure the representativity of this data. Due to that, multiple tests were carried out for comparison purposes.

In this work, an open circuit crushing model with a screening system was developed to obtain two different products - supra (size above the cut-grade) and infra (size below the cut-grade).

The Lynch matrix model was used to develop the crushing model, while the screening model was developed based on the Whitten probabilistic retention function. All data processing routine was carried out using MatLab R2017a software.

The main output of this work was a simulation tool that, after setting the crushing parameters, allowed for the simulation of different comminution scenarios. A jaw crusher was optimized using this model to maximize the production of material in the size range [20-10] mm - around 65%, minimizing the production of very fine material

- 17025 | The informal conversational genre as a tool for developing communicative competence in beginner and elementary levels of Portuguese as a Second Language

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Concerning the research in Portuguese as a Second Language (i.e., in immersive contexts), there is a need for further study the role of authentic materials in beginner and elementary levels and to broad the research on explicit and implicit learning of the phonetic and pragmatic-discursive features whose comprehension worsens due to the register inherent of less monitored and more informal communicative contexts.

This work aims to research the didactic possibilities of informal conversational discourse genre in levels A1.2 and A2 using audio samples of spontaneous discourse among natives of the target-language as authentic material. Two identical didactic proposals - based on task-supported language teaching (i.e., with focus on meaning and on form) and consisting in a progressive pedagogy from comprehension towards oral interaction - were implemented in both levels resorting to action research methodology.

The results show that: i) the setting of pre-tasks encompassing both the approach to the discourse genre and the emotional engagement is fundamental for a positive outcome; ii) informal conversational genre has a role in Portuguese as a Second Language for beginner and elementary levels using authentic materials and implicit/ explicit instruction on pragmatic-discursive features such as discourse markers and vague expressions; iii) learners' achievement is not directly linked with their proficiency level but with other factors that should be further studied.

Keywords: Informal conversational discourse, authentic materials, Portuguese as a Second Language (PSL), Communicative Competence, beginner and elementary levels (A1.2/ A2).

- 17026 | Parental influence on youth athletes' sport performance: A multi-sport study

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Currently, parental involvement on children's sport activities has become increasingly important, particularly given their influence not only on youth athletes' satisfaction and well-being, but also on sports performance. Therefore, this study intends to analyze the impact of parents on athletes' performance in different types of sports. For this purpose, a sample of 90 youth athletes from three types of sports completed self-report measures of parental support, parental pressure and subjective performance. Overall, results showed the important role of parents on athletes' success, revealing that athletes with higher levels of perceived parental support tend to display higher levels of subjective performance. Additionally, significant differences were also observed as function of gender and type of sport. These findings highlight the important role parents can play on their children sport activities, as well as provide important guidelines for future studies.

Keywords: Parental support, parental pressure, multi-sport athletes, subjective performance

- **17027 | A multi-target compound for ER+ breast cancer treatment: Evaluation of its anti-cancer properties**

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Introduction: Estrogen receptor-positive (ER+) breast cancer is the most common subtype of breast cancer worldwide. Estrogens, after being synthesized by aromatase, bind to ER α promoting breast cancer proliferation. Therefore, the therapies already approved act either by inhibiting aromatase or by modulating ER α . However, besides their therapeutic success, they induce several side effects, reason why it is crucial to discover novel therapeutic approaches.

Aim: Considering that aromatase, ER α and ER β display important roles in this type of cancer, our goal is to discover multi-target compounds able to simultaneously modulate these three targets and evaluate its biological effects.

Methods: After docking studies, MT1 was identified as a multi-target compound. We evaluated its ability to inhibit aromatase in human placental microsomes. Its in vitro effects on a fibroblastic non-tumoral cell line (HFF-1) and on an ER+ aromatase-overexpressing breast cancer cell line (MCF-7aro) were evaluated by MTT, Western-Blot, qPCR, flow cytometry and chemiluminescence assays.

Results: Although MT1 was not able to inhibit aromatase in human placental microsomes, this compound induced a significant decrease in its expression levels without any change in the transcription of CYP19A1 gene, a behavior similar to Exemestane, the steroidal AI used in clinic. Furthermore, MT1 impaired ER α activation and increased ER β protein levels. In addition, this compound disrupted cell cycle progression and induced apoptosis in MCF-7aro cells.

Discussion: To the best of our knowledge, this is the first multi-target compound with anti-cancer properties for ER+ breast cancer. Indeed, MT1 was able to modulate aromatase, ER α and ER β , key targets for this type of cancer, representing a great advantage in breast cancer treatment.

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- 17028 | Where they come from and where they're going to... Life trajectories of homeless people in a temporary shelter

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The main objective of this research is to explore the life trajectories of homeless people, as well as their prospects for the future. The relevance of this analysis arises from the observation that there is little scientific exploration of this phenomenon, particularly relating to people in temporary housing institutions. This study uses a qualitative methodology, resorting to anamnesis records (23 participants) and then semi-structured interviews (conducted with six participants aged between 47 and 57) to individuals living in a temporary shelter. The data analysis was mostly performed using NVivo 12 software, where a thematic analysis was performed.

The obtained results highlight relationship problems, whether marital (e.g. divorce) or familial (e.g. parental death), addictive behaviors, financial instability, unemployment and eviction as the main reasons given by the participants for the state of homelessness. The interviewees also emphasize the period of greatest exclusion as a phase of tremendous adversity (e.g. uncertainty of where to stay), except for one interviewee who mentions the security and quietness of living on the street. All respondents are satisfied with their entry into the institution and the services provided, highlighting both positive aspects (e.g. support received) and, albeit to a lesser extent, some negative aspects (e.g. accommodation of some colleagues). Regarding future prospects, participants displayed a great deal of forethought and caution given the discouragement of past experiences. The mentioned objectives can be aggregated into relational, occupational and housing related dimensions.

In sum, the present study aims to promote a deeper reflection on the trajectory of homeless people, the adversities they have been through and continue to experience and, mainly, to stimulate the debate on strategies for greater reintegration and less accommodation to their condition.

- 17031 | Optimization of the production of nanoparticles of $R_5(\text{SixGe}_{1-x})_4$ through Pulsed Laser Ablation in Liquids

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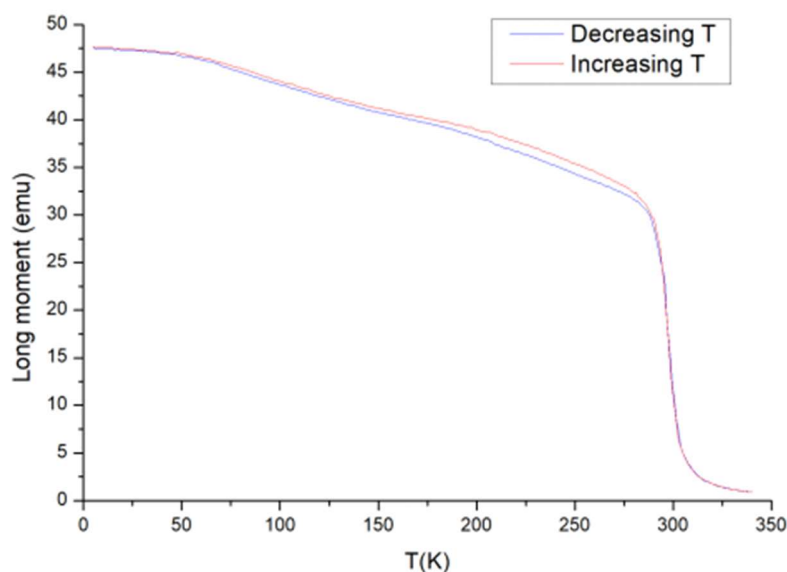
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The $R_5(\text{SixGe}_{1-x})_4$ alloys family, where the R stands for rare earths, presents characteristics of great scientific and engineering interest, such as the Giant Magnetocaloric Effect (GMCE) and Giant Magnetostrictive Effect (GMSE), amongst others. Due to these characteristics, these alloys see applications in fields as varied as refrigeration and medicine. In particular, $\text{Gd}_5(\text{SixGe}_{1-x})_4$ and $\text{Tb}_5(\text{SixGe}_{1-x})_4$ have been extensively studied over the recent years, because, by simply changing the concentration of Si, their magnetic transition temperature is altered, as well as their manifestation of the aforementioned effects, further increasing the range of applications.[1]

The physical properties do not always translate from bulk to the nanoscale, as the interaction between the material with itself and its environment changes, in particular, the ratio between the material's surface area and its volume increases drastically. However, these alloys seem to not only retain their relevant characteristics, but new ones emerge too, as is the case of the Giant Negative Thermal Expansion (GNTE). It is then of great interest to continue to study these materials at the nanoscale, so that they can become the solution to problems that went unresolved previously.

The use of the Pulsed Laser Ablation in Liquids (PLAL) technique to produce nanoparticles of these alloys greatly reduces the cost involved in their production as it removes the need for high vacuum. This way, the ablation process becomes faster and easier to reproduce in larger scales. However, the ideal parameters to produce the nanoparticles is still yet to be fully known and understood, hence the reason for this work.

The bulk material has been produced by Arc-Melting furnace and its microstructure, chemical, atomic structure, and magnetic properties will be characterized, as will the nanoparticles, through Scanning Electron Microscope (SEM), X-Ray Diffraction (XRD), and Superconductive Quantum Interference Device (SQUID).



: SQUID data for the $\text{Gd}_5\text{Si}_2\text{Ge}_2$ sample

- 17032 | Extracellular Vesicles as a Source of Cancer Biomarkers in the Urine of Urothelial Carcinoma Patients: a novel Liquid Biopsy for Bladder Cancer?

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Urothelial carcinoma (UC) is a malignant cancer that affects the urothelial cells, representing 90% of all bladder tumours. Each year there are nearly 118000 new cases ($\geq 50\%$ deaths) attributed to UC in Europe. At diagnosis 75% of bladder cancers are non-muscle invasive tumours.

Importantly, from the patients that undergo transurethral resection of the bladder tumour, nearly 35-80% will experience disease relapse and 10-20% will progress to muscle invasive tumour, requiring thereby, a rigorous and expensive follow-up. Currently, this is performed through the frequent use of highly invasive cystoscopy and the low sensitivity urine cytology. Therefore, innovative liquid biopsy-based biomarkers that circumvent these drawbacks are highly desirable for improved UC clinical management.

Recently, extracellular vesicles (EVs) have been increasingly recognized as a potential source of cancer biomarkers in liquid biopsies. Here, we have established a protocol for the isolation and characterization of EVs from UC patients' urine samples. For that, a two-step protocol involving ultracentrifugation followed by size-exclusion chromatography was optimized. The isolated urinederived EVs from 5 UC patients were then characterized according to their size, concentration, morphology, protein amount, presence of EV-associated and disease-associated protein markers.

Isolated urinary EVs from UC patients had a size ranging from 50nm to 400nm with characteristic EV morphology, express EV-associated markers such as CD63 and HSP70 and are negative for cell debris markers. Taken together, these results indicate that a two-step EV isolation protocol was properly implemented and validated in UC patients' urine samples. Notably, several EV-associated disease biomarkers were detected in the urine of UC patients and monitored throughout distinct stages of the disease. This EV-based liquid biopsy might provide the means for real-time monitoring of residual disease and risk of relapse in UC patients.

- **17033 | Pessaries containing lipid nanoparticles for vaginal progesterone administration**

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The administration of progesterone is preferable through vaginal route, as this drug has an extensive hepatic first pass effect. Nonetheless, conventional vaginal progesterone dosage forms require repeated administrations to ensure the maintenance of the therapeutic levels. The aim of this study was the development of pessaries containing progesterone-loaded in nanostructured lipid carriers (NLC) for prolonged delivery of progesterone.

The prepared progesterone-loaded NLC showed 90% of nanoparticles with sizes equal or lower than 219 nm, which has been described as acceptable for topical delivery. The amount of progesterone loaded in the NLC was 96,4%, revealing the effectiveness of the system for drug incorporation. The biocompatibility of the progesterone-loaded NLC was evaluated in HaCaT cells, by the neutral red uptake, resazurin reduction and sulforhodamine B binding assays, 24 h after exposure. No significant effects were observed for concentrations up to 10 µg/mL, suggesting the biocompatibility of the formulation. The in vitro drug release studies showed that, after 24h, 28% of progesterone was released from the NLC, revealing a prolonged release effect. Pessaries containing NLC-PRG were characterized according to the European Pharmacopoeia, being observed uniformity of dosage and with adequate disaggregation characteristics. The results of this study suggested the suitability of using NLC for prolonged progesterone release from pessaries, although further studies need to be performed to confirm this application.

- 17036 | Thymus derived Tregs and peripheral Tregs promote tumour tolerance

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One of the pathways used by tumour cells to escape from the immune response is the induction of immunotolerance, in which regulatory T cells (Tregs) play a crucial role due to their suppressive capacities. Depending on their origin, Tregs are divided into two main groups: thymus-derived Tregs (tTregs), associated with central tolerance, and peripheral Tregs (pTregs), which are converted from CD4⁺ T effector (Teff) cells in the periphery, being associated with peripheral tolerance. However, there are no specific markers to distinguish them, and there still remains to be uncovered the origin of tumour-infiltrating Tregs (tiTregs). We hypothesized that tiTregs may have two distinct origins showing the importance of both types of tolerances in tumour progression.

To address our hypothesis, we used two models of tumorigenesis. Lrig1-CreERT2/+;Apcflox/+ mice, which develop intestinal/colonic tumours after tamoxifen injection, and FoxP3GFP mice, in which we implanted subcutaneous tumours through MC38 cells injection. To determine the origin of tiTregs we compared TCRb sequences between Tregs and CD4⁺ Teff cells. We sorted Treg and CD4⁺ T cells from these tumors using fluorescence activated cell sorting, using antibodies against CD3, CD4, FoxP3 and CD25 markers, followed by TCRb sequencing for both populations, and comparison of their sequences.

In both models, the majority of TCRb sequences were not shared by these populations, showing that most tiTregs have a central origin. But in the MC38 derived subcutaneous tumour, we identified about 40% tiTregs as pTregs.

Our data also implies that some pTregs are converted from CD4⁺ Teff cells at the tumour site, by comparing of tumour and blood samples.

In summary, we propose a strategy to evaluate the origin of tumour-infiltrating Tregs, and observe that both populations of Tregs are present in those tumours, showing the importance of central and peripheral tolerance in tumour escape from the immune system response.

- 17038 | The educational service of a Museum: ideas and practices that ascribe meaning to the concept

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There is a growing concern about education in museums, associated with the idea that these should be spaces not only artistic and the scientific divulging, but simultaneously educational. In this context, the need emerge, in the cultural institutions, for the creation of a service responsible for the educational slope, called Educational Service. However, the structures of this service are undoubtedly not yet consolidated and organized, and in some institutions, namely in the portuguese context, they are still fragile and under-resourced, as the educational service is neither prioritized nor seen as unquestionably important for the functioning of the cultural institutions. Despite that, it is through educational services that museums are expected to develop their functions to progressively improve accessibility to the community, seeking to match the diversity of audiences, and to mediate between the institution's offer and the demand, expressed through the needs and interests of potential visitors.

Therefore, the main objective of this study is to identify the ideas and the discourses that ascribe meaning to the concept of educational service, as well as the practices associated with it developed in a cultural institution, and also the meaning attributed to this service by the collaborators in the development of their activities and process of educational and social interaction.

The research strategy is the case study and discourse analysis is the theoretical-methodological framework mobilized, considering the discursive struggle around the concept of educational service, and it was possible to realize that the idea of educational service is articulated with schooling and the inclusion and diversity. In the development of practices, schooling seems to be the most evident idea. Institutional documents, interviews with key actors and field notes are the main corpus of the research.

- **17039 | Painting as an event: an ephemeral experience**

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In our daily life we draw around us a set of natural phenomena that appear in an ephemeral reality. Thus, we seek to understand how the work can be a spatiotemporal record of an ephemeral experience. The issue at stake is not so much the transience of the material, where its decenterization has been deliberated by the artist or its intrinsic temporary nature. Rather, one seeks to see the work here as a result of physical experience with the materials and the incorporation of gestures and movements.

Using Merleau-Ponty's phenomenological theories, we try to understand the expressive dimension of the body, in a constant relationship with the self, the other and the world. In this context, artists are presented who have the performative act as an essential moment for pictorial creation. The body and its actions become the main means for the development of the work, in which the work is conceived to an extent as an event.

Keywords: body, experience, phenomenology, performativity

- 17041 | Identification and Characterization of Novel *Listeria monocytogenes* Virulence Factors

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Listeria monocytogenes is a recurrent problem in public health and food industry. It is a foodborne Gram-positive intracellular pathogen and an outstanding model to study host-pathogen interactions. This bacterium has the ability to cross the intestinal, blood-brain and the placental barriers and colonize host tissues causing listeriosis. This capacity is achieved by numerous virulence factors that allow *L. monocytogenes* to invade, survive and multiply within phagocytic and non-phagocytic cells. The analysis of how this pathogen manipulates the host cell functions leads to the identification of new mechanisms that could be extended to other relevant pathogens, and help designing new therapeutic strategies. Therefore, this work aimed to identify and characterize new *L. monocytogenes* virulence mechanisms.

The first in vivo transcriptomic analysis of *L. monocytogenes* revealed that a number of virulence genes are highly expressed during mouse infection and that the majority of these virulence factors are surface and secreted proteins. To identify new virulence determinants, we selected three up-regulated in vivo genes, *lmo2114*, *lmo2115* and *lmo2522* with a putative role in *L. monocytogenes* virulence. Deletion mutants were generated in order to characterize the role of the selected genes in the *L. monocytogenes* infectious process by analysing different steps of the cell infection cycle in vitro and virulence in vivo. We showed that the ABC transporter encoded by *lmo2114* and *lmo2115* is required for bacterial entry in eukaryotic cells and for full virulence in vivo. Moreover, we observed that the putative cell wall-binding protein encoded by *lmo2522* plays also an important for *L. monocytogenes* pathogenicity. Altogether, this work allowed the identification of new *L. monocytogenes* virulence genes important for infection and thus provided new potential targets for the development of anti-virulence strategies.

- 17043 | Gut hormones influence the visceral adipose tissue exometabolomic profile of obese pre-diabetic individuals

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Glucagon, glucagon like-peptide 1(GLP-1) and glucose insulinotropic peptide(GIP) are gut hormones with important roles in energy and glucose homeostasis regulation, with potential pharmacological application for type 2 diabetes(T2D) treatment.

Our aim was to analyse whether these gut hormones influenced visceral adipose tissue(VAT) exometabolome profile of non-obese(NO) and obese with pre-T2D(OPT2D) subjects.

VAT samples were obtained during elective surgical interventions. VAT fragments from NO(N=4) and OPT2D(N=5) individuals were left for 48 h at 37 °C, 5% CO₂ in DMEM-F12 and 100 nM of insulin. VAT fragments were then exposed either to Glucagon, GLP-1 or GIP in graded concentrations(1 nM, 10 nM, 100 nM). Culture media was analysed with 1NMR spectroscopy and peaks associated with eight metabolites were quantified, namely: glucose(Glu), pyruvate(Pyr), lactate(Lac), acetate(Act), alanine, valine, isoleucine(Ile) and pyroglutamate(Pca).

Different exometabolome signatures arise when comparing the study groups. In baseline conditions, Pyr and Pca consumption, as well as Act production were reduced.

After hormonal stimulation, several changes in VAT exometabolite profile were found. In NO, glucagon and GLP-1 decreased Pyr consumption, while GIP produced no noticeable changes. Whereas in OPT2D, glucagon reduced Lac production and increased Pca consumption; glucagon and GLP-1 both decreased Ile consumption; and GIP decreased Lac production, decreased Glu consumption and increased Pca consumption.

Our results suggest that gut hormones modulate the VAT exometabolomic profile of patients with obesity and pre-diabetes, which may contribute for changes produced in the systemic metabolic profile. These results suggest that additional metabolic effects could be anticipated in the future, while using gut hormone analogues for diabetes treatment.

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- 17046 | Consistency of biomechanical and coordinative variables between successive cycles in front crawl swimming

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Intracyclic velocity variations (IVV) are an indicator of swimmers performance that make accelerations and decelerations in evidence. They are an expression of propulsive and drag forces predominance alternation, which is associated to swimming coordination. The aim of this study was to verify the biomechanical and coordinative variables consistency during front crawl swimming to determine its velocity to time typical cyclic profile. Seventeen female swimmers performed 25m front crawl at maximum intensity to assess kinematics using two cameras (under and above water). Velocity was obtained from differentiation of the camera and swimmer relative positions. Biomechanical and coordinative variables, coefficients of variation, cross correlation and autocorrelation were assessed. Swimmers were divided into groups for comparing those with more and less consistent front crawl cycles. The cycles analysis was performed by visual inspection and an intra and interindividual analysis of the variables. Results presented bimodal and trimodal curves, having two positive accelerations related to the main propulsive actions of the upper limbs and decelerations during the non-propulsive ones, showing the existence of a typical cycle in front crawl technique. However, the mean curve was not representative of the individuals, demonstrating relevant intraindividual variability. The cycle analysis showed IVV ~11%, cycle duration ~1.18s, mean velocity ~1.68m·s⁻¹, maximum velocity ~2.04 and 121% from mean velocity, minimum velocity ~1.31 and 79% from mean velocity, exhibiting a tendency to remain constant despite the small variations between cycles. The intracycle phases remained consistent along the swim. The less consistent group of swimmers presented the best biomechanical results (e.g. velocities), suggesting having a better ability to adapt to the constraints of the aquatic environment. The variations probably happen due to individual variability and the constraints of human movement.

- **17047 | Enantioselective synthesis of xanthone derivatives with potential biological activity**

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Xanthenes can be either synthesized or found in nature, being associated to many biological activities [1, 2]. Many xanthone molecules are not chiral but they have been described as chemical substrates to build a library of chiral derivatives of xanthenes (CDXs) towards different biological activities such as anti-inflammatory, antitumor, antipyretic, among others [1,2]. The aim of this project was to synthesize a new library of both enantiomers of diverse CDXs associated with amino esters and amino acids for further explore their activities as antimicrobial and antitumoral agents. The 2-((9-oxo-9H-xanthen-3-yl)oxy)acetic acid (XCar) was synthesized, and used as chemical substrate to synthesize a library of CDXs. The XCar was bonded to both enantiomers of several commercial available amino esters using the coupling reagent COMU or TBTU. Afterwards, CDXs of amino acids were obtained by alkaline hydrolysis of the correspondent CDXs derived from amino esters. The structure elucidation was achieved by NMR and FTIR analysis. The enantiomeric purity of the synthesized CDXs was evaluated by liquid chromatography using a chiral stationary phase based on a polysaccharide derivative. The synthesized CDXs are under in vitro evaluation of growth inhibition of three human tumour cell lines, namely A375-C5 (melanoma), MCF-7 (breast adenocarcinoma), and NCI-H460 (non-small cell lung cancer). The antimicrobial activity in six different strains are also under evaluation.

This work was supported by the Strategic Funding UID/Multi/04423/2019 through national funds provided by FCT and ERDF, through the COMPETE - POFC program in the framework of the program PT2020; the project PTDC/MAR-BIO/4694/2014 (reference POCI-01-0145-FEDER-016790 and 3599-PPCDT), co-financed by COMPETE 2020, under the PORTUGAL 2020 Partnership Agreement, through the ERDF, and CHIRALBIOACTIVE-PI-3RL-IINFACTS-2019.

1. Fernandes, C., et al., *Molecules*, 2019. 24(4).

2. Araújo, J., et al., *Molecules*, 2019. 24(2)

- 17049 | Haematopoietic changes in the offspring induced by maternal Group B *Streptococcus* GAPDH vaccination

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Group B Streptococcus is a severe neonatal pathogen. We identified the GBS glyceraldehyde-3-phosphate dehydrogenase (GAPDH) as a promising vaccine target. However, since this enzyme is highly conserved, the vaccine responses might present cross-reactivity with commensals. Indeed, unpublished data from our group showed that anti-GAPDH IgG antibodies recognize pups' intestinal commensals. Studies showed that gut microbiota regulates haematopoiesis and metabolism. Therefore, we evaluated the maternal GAPDH vaccination impact in offspring haematopoiesis throughout the first week of life. Female BALB/c mice were immunized with recombinant GAPDH and Alhydrogel (GAPDH-vaccinated) or with Alhydrogel (control). Haematopoietic progenitors in the bone marrow (BM), liver and spleen, and myeloid and lymphoid populations in the two later organs, were determined by flow cytometry, at different postnatal day (P) in pups born from the 2 groups. Haematopoietic alterations are observed in GAPDH-vaccinated progeny at P5, with decreased progenitor cells in BM and spleen, and increased myelopoiesis in liver, compared to the control progeny. At P8, an overall increased myelopoiesis is observed in GAPDH-vaccinated progeny. An inflammatory state is detected in this group, with increased phagocytic cells and inflammatory monocytes, at P5, in liver and spleen. Regarding the lymphoid population, increased number of CD5+ B cells in liver and spleen at P5, and decreased number of $\gamma\delta$ T cells in liver at P8, is observed in pups born from GAPDH-vaccinated dams. Histology of liver shows an altered metabolism in the GAPDH-vaccinated offspring, with higher hepatocyte vacuolation at P8 and P14, when compared to age-matched control. Moreover, female GAPDH-vaccinated offspring seems more predisposed to weight gain when weaned mice are submitted to a high-fat diet for 30 days. Altogether, this work shows the impact of maternal GAPDH vaccination on haematopoiesis and metabolism of their offspring.

- **17050 | Perirenal Adipose Tissue at the Crossroad with Renal Cell Carcinoma**

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Compelling evidence exists over the influence of obesity on cancer development. Excess adipose tissue (AT) accrual is a well-established factor for cancer incidence in Renal Cell Carcinoma (RCC) and is among the cancers for which this effect is more consistent. Nevertheless, RCC patients with excess adiposity at diagnosis experience longer survival than non-obese patients, comprising an "obesity paradox". Notwithstanding, the influence of local adipose depots in RCC are largely unexplored.

This project focused on AT-RCC interface, using an in vitro human AT explant culture model, and proposed to unveil potential mechanisms through which AT exerts its influence on RCC by: exploring the differences between periprostatic and subcutaneous adipose depots; addressing the influence of AT secreted factors on hypoxia, the inflammatory-, epithelial to mesenchymal transition- and stemness-related genes in RCC; and evidencing the role of adipose depot-derived soluble factors on hallmarks of cancer, namely proliferation and apoptosis of 786-O and Caki-1 RCC cells. The resulting data suggest that both perirenal and subcutaneous adipose depots exert an influence over RCC primary tumours, increasing the expression of genes that contribute to progression and development of RCC while decreasing tumour viability.

This study provides insight over the influence of site-specific adipose depots for RCC and, importantly, conveys promising data to expand the knowledge over the AT-cancer interface, ultimately delivering prospective approaches for the development of novel therapeutic targets to impact beyond RCC, the surrounding tumour microenvironment, particularly the adipose depot.

- 17055 | Housing in Bonfim: communitary dynamics and design processes in oriental Porto

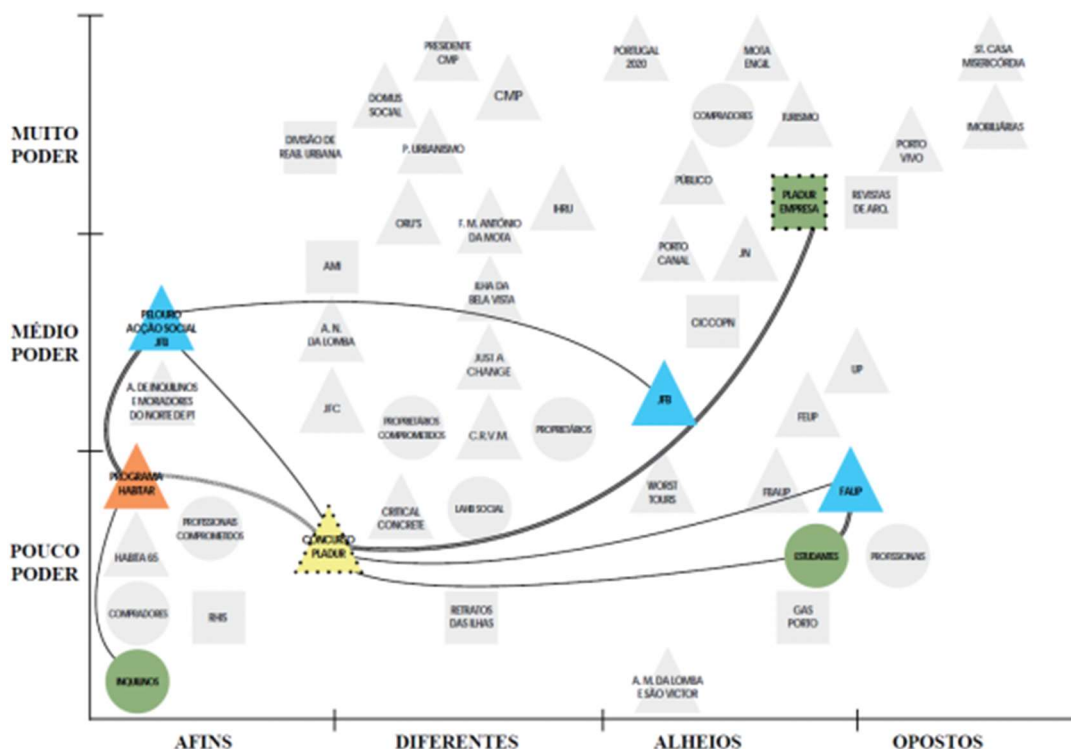
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In light of the current dynamics taking place in the city of Porto and at a time when inequalities in access to housing continue to spread, this research aims to illustrate the urban space dispute from the specific case of Porto *ilhas*.

The opposition of some groups to the disparity between the low income of the Portuguese population and the values practiced in the housing market suggests that these inequalities have been *gaining ground*. Therefore, new articulations were sought to make it possible for the architect to serve population groups that normally cannot afford his services.

From the mapping of the networks that support the rehabilitation of a *ilha* in the public, private and associative sectors, it was possible to identify the intervening agents and the relationships established between them, as well as identifying articulations that can be created or strengthened, in order to safeguard the interests of the populations.

Following the saturation of the urban center, this dispute processes expanded to formerly peripheral areas such as Bonfim - that has gone from industrial territory to speculative interest land. In the same wave, the *ilhas* went from basic housing resource to a *very typical* Porto product. Therefore, it was concluded that the architectural interventions that aims to respond to the real needs of the territory should not focus so much on the form of the architectural object, but rather on the relations between the actors that enable the materialization of the interests of all citizens.



Design of the network involved in the 27th Edition of the Pladur Constructive Solutions Competition (2017)

- **17057 | Characterization of the amino acid profile of a coffee by-product: the silverskin**

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Coffee is popular worldwide and its rising production brought an increasing amount of wastes, which represent a source of environmental contamination. However, they represent a good source of bioactive compounds, which can be extracted and used in innovative ways. Indeed, a well-structured chain management can benefit the development of a more sustainable coffee industry, creating a more environmentally friendly economy. Coffee silverskin, the main by-product of coffee roasting, appears as a particularly interesting by-product due to its high concentration in fiber, protein and antioxidants. As far as we know, there are no reports about the amino acid profile of silverskin, which could be of interest especially when food and food supplement applications are being considered. Therefore, the aim of this work was to study the free and total amino acid profiles of coffee silverskin by high performance liquid chromatography with fluorescence detection. Aspartic acid (155 µg/g) and arginine (153 µg/g) were the main free amino acids. Regarding the total profile, all essential amino acids were present. Aspartic acid (10.2 mg/g) and glutamic acid (9.2 mg/g) were the major compounds. Branched chain amino acids (leucine, isoleucine and valine) were also present in substantial amounts (7.6, 4.7 and 5.0 mg/g), as well as proline (5.2 mg/g) and arginine (5.0 mg/g). These results show that coffee silverskin is a source of relevant amino acids with potential to be used in food products and food supplements intended for cognitive and physical performance improvement.

Acknowledgements

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- **17059 | How Facebook Communicates on Facebook**

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The evolution of the digital and technological age has been increasing its presence in the world of Public Relations. Social media, namely Facebook, are of the utmost importance for brands and business' communication, and implementation of media strategies. The strengthening of digital platforms rises both problems and solutions. This forces the market to adapt to attend needs and demands from an increasingly technologically dependent society. Social networks have changed the norm regarding organizational communication and Facebook became a key element in this process.

Our goal is to understand how this network communicates on its platform and how it takes advantage of its potential, being the ones who know it best. We opted to analyze Facebook seeking to understand how and if it changed its communication during the Cambridge Analytica scandal. In this regard, we present two hypotheses: The first one being if the company changed its number of posts made during the scandal, and the second being if it has or has not changed its usual communication during the period in question.

We will proceed to a quantitative analysis of Facebook's posts during the year 2018, considering the following categories: date, hour, quantity, type, subject, reach/engagement - measured by reactions, comments, shares and views. After the analysis, we hope to apprehend in which way Facebook reacts and what content it decides to communicate.

- **17060 | Certain linguistic structures in one of Sérgio Moro's judgment against Luiz Inácio Lula da Silva - a Critical Discourse Analysis approach**
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The purpose of this investigation is to analyse certain linguistic structures present in the judgement rendered by the then Brazilian federal judge Sérgio Moro in the criminal procedure 5046512-94.2016.4.04.7000/PR against Brazil's former president Luiz Inácio Lula da Silva and other defendants. This conviction for bribery and money laundering was the first judgement against former president Lula in the context of Operation Car Wash ("Operação Lava Jato"). This judgement has an undisputable relevant role in Brazil's recent history and many legal and sociological analyses have been made over it. This study aims to make a contribution through a specifically linguistic analysis of certain structures present in the decision, from a critical discourse analysis approach.

Two categories were selected: the use of counter-argumentation combined with concessive clauses and the use of adjectives as a means of conveying subjectivity on the part of the judge. The judgement, a public document available on the internet, was firstly treated to delete quotations from court precedents, audio transcriptions and other parts not relevant for this study. After the document had only the relevant content, i.e., Moro's discourse, it was processed in the following two tools: VISL and Corpógrafo.

The results of the automatic analyses were then further qualitatively analysed with respect to the two research categories. The use of the counter-argumentative concessive clauses will be examined in view of their relevance to evidence differences in opinions and criticism as well as their usefulness in a document that is expected to be impartial, such as this. The main references to be considered are Livnat (2015), Pinto and Rodrigues (on press), and Ducrot and Anscombre (1977). In respect to the use of adjectives, their classification into categories and their positive, negative or neutral semantic polarities will be addressed. Kerbrat-Orecchioni (1980) is one of the main references for this.

- 17066 | MDM2 expression in Epstein-Barr virus-associated gastric cancers

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Gastric cancer has been associated with Epstein-Barr Virus (EBVaGC) in 10% of all gastric cancers and is characterized by a distinct molecular profile. Recently it has been shown that in EBVaGC there are no TP53 mutations, nevertheless it may be observed accumulation of wildtype p53 in these tumors. In this study we aimed to analyze the potential role of mdm2 protein, the major p53 negative regulator, as the explanation for the p53 dysregulation in EBVaGC.

We used tumor samples collected from formalin-fixed paraffin-embedded tissue blocks collected from IPO-Porto patients with EBV-positive (EBVaGC, n=12) and EBV-negative (EBVnGC, n=27) gastric cancers. MDM2 expression levels was assessed by two-step real-time PCR. Protein status in the tissue was analyzed by imunohistochemistry (IHC), using a specific monoclonal antibody. IHC demonstrated that mdm2 is present in 5/12 EBVaGC and 10/27 EBVnGC, with 80% of EBVaGC showing expression in the majority of cells, compared with 20% in EBVnGC (p=0.089). A significative difference was found when compared high mdm2 expression in EBVaGC and EBVnGC diffuse histological subtype (p=0.048). When we combined mdm2 and p53 expression, we observed that in cases with mdm2 expression, high p53 expression is more common. Regarding the MDM2 mRNA levels, a significative increased expression was observed in EBVaGC, when compared with EBVnGC intestinal type (p=0.034) and a trend when compared to EBVnGC indeterminate type (p=0.057). The comparisson of the protein expretion in tissue and mRNA showed do not seem to be responsible for protein accumulation.

Our study shows that mdm2 may be an important marker for EBVaGC, which is reflected in the higher accumulation in tissue, in these cases. Furthermore, this is probably explained by the increased transcriptional activity, enhanced by some viral protein or miRNA. Also, mdm2 increase does not impair with p53 accumulation, indicating that there is some dysregulation in the p53-mdm2 balance.

- **17067 | Modalization and sexualization in a legal judgement: a case study**

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The objective of this work is to understand the workings of language in rape court decisions. To attain this objective, we will focus on the modalization mechanisms as a reflexion of subjectivity and intersubjectivity, as well as in the argumentative strategy in the judgements under study. Our hypothesis is that discourse is a key-entity in the maintenance of certain cultural values or in the establishment of new ones.

In terms of conceptual and theoretical frame, we assume the modalization as the main factor of the subjective standpoint of the speaker, who employs semantic-argumentative resources with pragmatic functions, to construct his identity and the identities of the coenunciators. In this sense, as an argumentative strategy, the modalizers not only mark the point of view, the beliefs and the attitudes of the speaker in relation to what he states, but also in relation to the interlocutor (Maingueneau, 2011: 97-98). Regarding the adopted methodology, a legal judgment case was selected and analyzed in terms of its linguistic-discursive strategies. As preliminary results, we can confirm that the legal discourse is ideologically marked and legitimated by the social position of the subjects that have the power to decide, as indicated by the lexical, informational and intertextual choices revealed in the text.

- 17068 | The effect of position at play on unilateral thrust, functional motor asymmetry and bilateral thrust of senior male handball players

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Motor coordination and vertical impulse are very important abilities in handball. This research was developed with the following aims: (i) to investigate the effect of the position in the game [Goalkeeper (GK), First Line (1stL) and Second Line (2ndL)] on the coordination and unilateral vertical impulse (VI) [preferred foot (PF) and non-preferred foot (NPF)] and on the resultant functional motor asymmetry (FMA); (ii) to comprehend the effect of the position in the game of the VI with both limbs; (iii) in the total sample and in each position, to correlate the variables under study. The sample involved 22 male handball players, born between 1999 and 2002 (18.45 ± 1.06), with 7.91 ± 2.77 years of practice. For the coordination and unilateral VI evaluations, the KTK test was applied [1] and for the evaluation of the VI of both limbs, the Vertical Jump Test (VJ) was applied using a contact platform. FMA was calculated $|PF-NPF|$ in KTK test. The statistics used were descriptive and non-parametric (Kruskal-Wallis, Mann-Whitney and Spearman correlations). Results: (i) According to KTK and in the VJ, there was an effect of the position in game (PF and NPF, being the 2ndL more proficient). Comparing peer groups, the only pair for which no significant differences were found was GK vs 1stL. In the total sample, there were significant correlations between KTK-PF and KTK-NPF ($r=0.706$, $p<0.000$), KTK-PF and VJ ($r=0.755$, $p<0.000$) and KTK-NPF and VJ ($r=0.887$, $p<0.000$). Conclusion: The position in the game had a significant effect on coordination and VI of each limb and on both limbs simultaneously. Some variables under analysis showed a strong positive association, especially in the 2ndL.

[1] Kiphard, E.J., & Schilling, V.E (1974). *Körper-koordinations-test für kinder KTK: manual* Vorz Fridhelm Schilling. Weinheim: Beltz Test.

Key-words: Handball; game position; coordination; vertical impulse; functional motor asymmetry

- **17071 | Static Balance in artistic and acrobatic gymnastics (Ciências do Desporto)**

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Balance is a very important ability in gymnastics. The purpose of this study was to compare the unipedal and bipedal static balance between 9 artistic female athletes and 10 acrobatic female athletes (10.37 ± 1.21 years). It was applied the Flamingo Balance Test (FBT) (1), the Standing Stork Test (SST) (2) and the Diver's Balance Test (DBT) (2). Statistical procedures involved descriptive statistics and non-parametric tests (Mann-Whitney, Wilcoxon and Spearman correlations), with a significance level of $p < 0.05$. Results (i) According FBT, Artistic athletes, compared to acrobatic athletes, performed significantly better with preferred foot (PF) (2.22 ± 1.53 and 10.40 ± 4.17 , respectively) and non-preferred foot (NPF) (2.89 ± 2.32 and 10.00 ± 3.09 , respectively). The same occurred to SST: PF (29.89 ± 14.99 and 9.20 ± 6.02 , respectively) and NPF (28.89 ± 12.25 and 9.90 ± 5.20 , respectively); (ii) In bipedal balance, there were non-significant differences; (iii) There was no effect of the modality on functional motor asymmetry (FMA) of the SST. The contrary was verified in FBT, the Artistic gymnasts showed a significant ($p = 0.121$) lower FMA compared to Acrobatic gymnastics (1.11 ± 2.26 and 2.60 ± 0.97 , respectively); (iv) In each modality, comparisons between PF and NPF (FBT and SST) did not revealed significant differences between feet; (v) In Acrobatic gymnastics, according to SST, there was a significant positive correlation between NPF and FMA ($r = 0.632$; $p = 0.050$). In Artistic gymnastics, several negative correlations were found, namely between the NPF (FBT) and the FMA (SST) ($r = -0.759$; $p = 0.018$); between the NPF (SST) and the FMA (FBT) ($r = -0.711$; $p = 0.032$); between the PF (SST) and FMA (FBT) ($r = -0.818$; $p = 0.007$); and the only positive correlation was detected in the SST between NPF and PF ($r = 0.761$; $p = 0.017$).

Keywords: Static balance, artistic gymnastics, acrobatic gymnastics, functional motor asymmetry

- 17072 | How does parental influence affect the positive development of young athletes

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The parents behaviors in their children's sports life influence the positive development of young athletes. This investigation's goals were: (i) understand how the personal (PR) and social responsibilities (SR) were influenced by their parents; ii) understand the relationship of this influence between male and female athletes. For the study, the sample was 40 male (N=20) and female (N=20) volleyball players born in 2004 (14.777 ± 0.42), with 4.55 ± 2.47 ages of practice. To evaluate the PR and PS it was applied the Personal and Social Responsibility Questionnaire [1] and the influence of the athletes' parents it was applied the Parental Behaviour in Sports Questionnaire [2]. The statistic used was descriptive and non-parametric (T-test independent measures and Pearson's correlation). Results: There were various positive correlations between the PS and SR ($p=0.001$), between the PR and the practice/competitions' accompaniment by the father ($p=0.023$), and between the SR and the parent's sports support by the father too ($p=0.047$). In the comparison of the answers between genders, there weren't significant differences. In the total sample, there were significant correlations ($p<0.000$) in the technical and sport influence and in the insatisfaction with the sports performance (between mother and father). Conclusion: The personal and social responsibilities are highly influenced by the practice/competitions' accompaniment and sports support by the parents. The gender doesn't interfere in the way the young athletes are influenced by the parents, and, it's in the insatisfaction with the sports performance and in the technical and sport influence that there are the greater similarities in the way they are influenced by the father and by the mother.

Key-word: personal and social responsibility; positive development; parent behaviours; volleyball

- **17074 | Hoxd13 targets and vertebrate limb evolution**

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The fossil record suggests that tetrapod limbs are derived from fish fins that suffered sequential alterations throughout evolution. Several studies have suggested that Hoxd13 played a major role in this evolutionary transition. Indeed, when we over-expressed hoxd13a in developing zebrafish fins, we found formation of additional distal bone and reduction of the embryonic dermoskeleton, recapitulating the events thought to have occurred during evolution.

We tested 10 putative downstream targets of Hoxd13 in transgenic zebrafish after overexpressing this gene. We found them to be ectopically up-regulated in the distal margin of these fins. In addition, we generated a transgenic line allowing bmp2b overexpression, which resulted in shortening of the finfold.

Currently, we are studying a mutant zebrafish line with long-fin phenotype and our aim is to use it as a model to confirm that dermoskeleton size is dependent on hoxd13/bmp2 interaction and characterize the molecular mechanism involved in the finfold elongation, to better understand limb transition. We also aimed to compare finfold development in wild-type zebrafish (WTAB) and a mutant line outcrossed with WTAB (leot1lofdt2xWTAB) and determine if a new outcross with WTAB affects this phenotype. We have studied the development of the finfolds through In Situ Hybridization (ISH), using dermoskeleton markers, to compare the mutant lines with the wild type. Furthermore, we performed gene expression assays, to evaluate if the increased finfold size observed in the mutants by ISH reflects on higher levels of expression of genes involved in endoskeleton development.

We hypothesize that during evolution increased levels of Hoxd13 may have up-regulate bmps, inhibiting factors responsible for finfold elongation, and that this mutant line may show a hoxd13/bmp2 relationship contrary to the one identified in fish overexpressing these genes, being a useful model to explore the mechanisms associated to the fin-to-limb transition

- **17075 | Green exercise and psychological well-being: the case of surf**

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This research paper aimed to verify the hypothesis that natural environments are capable of improving the, already positive, relationship of sports practicing with subjective well-being and experiences associated with sports practice. Seventy young adults, aged between 18 and 35 years old, of which 35 surf athletes and 35 indoor athletes, were submitted to the Portuguese version of the following questionnaires: Satisfaction with Life Scale (SLS), Positive and Negative Affect Schedule (PANAS) and Subjective Exercise Experience Scale (SEES). Although the results did not show significant statistical differences between the groups, surf athletes had better scores in most of the subjective well-being domains, projecting a clear trend. The data of this research allow us to believe that the same study with a bigger sample could show a significant statistical difference between these two populations and prove the positive association of sports practicing in natural environments with subjective well being and experiences associated with sports practice.

- 17078 | Effect of cognitive performance and physical education performance at school on simple and two-choice reaction time

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Actually, there is an improved interest in understanding the links among different domains of adolescents' motor and cognitive development [1]. So, the purpose of this study was to investigate the effect of cognitive performance (CP) and physical education motor performance (PEMP) at school in the visual simple reaction time (SRT) and two-choice reaction time (TCRT) performance. A total of 47 adolescents between 14 and 15 yr, divided into 2 groups, according CP (mean of the theoretical areas at school) or PEMP (mark on PE), were studied. In a 5-mark scale, one group (G1) presents a mark less than 4 and the other group (G2) presents a mark of 4 or more. SRT and CRT were teste beyond an online reaction time test performed in a computer. Subjects performed 20 trials with preferred hand (PH) and 20 trials with non-preferred hand (NPH). For TCRT we registered the time and percentage of errors. Statistical procedures involved descriptive statistics and non-parametric tests (Mann-Whitney). Significance level was set at $p < 0.05$. Results: (i) Cognitive performance mark did not present any significant effect on the variables under analysis; (ii) PEMP mark presented a significant effect on SRT with PH ($p = 0.026$), NPH ($p = 0.026$) and on TCRT ($p = 0.022$). In all situations, the G2 (mark of 4 or more) presented a better reaction time performance than G1 (PH: 311.42 ± 30.83 vs 334.35 ± 42.42 ; NPH: 319.25 ± 38.85 vs 322.96 ± 71.34 ; CRT: 476.75 ± 57.01 vs 561.78 ± 151.35). Conclusion: PEMP mark but not CP mark presented a significant effect on SRT (PH and NPH) and on TCRT.

[1] Donnelly JE, Hillman CH, Castelli D, Etnier JL, Lee S, Tomporowski P, Lambourne K, Szabo-Reed AN. 2016. Physical activity, fitness, cognitive function, and academic achievement in children: a systematic review. *Medicine & Science in Sports & Exercise*. 48(6):1197-1222.

Keywords: Simple reaction time; Complex reaction time; Cognitive performance; Physical education; School.

- 17096 | Quantification and valuation of ecosystem services of the monumental trees in the city of Porto

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Trees in urban areas provide many benefits such as the removal of air pollutants, reduction of air temperature and avoid surface runoff. Unaware of their value, they are often included in underappreciated spaces in urban area and without adequate planning to allow their good development. The city of Porto has hundreds of monumental trees of public interest (MTPI) with a strong cultural connotation and great potential for the provision of ecosystem services (ES). The objective of this work is to quantify and calculate the monetary value of some regulating ES provided by MTPI, identify potential trends and define guidelines for valuing and managing MTPI. In addition, a survey was conducted to understand the importance that people attribute to these trees, in which a stated preference methodology (contingent method) was applied. The assessment and quantification of regulatory ES, including their monetary valuation, was developed with the support of the i-Tree Eco modeling tool (Fig. 1). The questionnaire showed that people want to preserve MTPI and are financially available to ensure their continuity. Despite the fact that younger people, are the ones who value the least the benefits of these trees, they are the ones who are more receptive to information on this subject. It is estimated that each year MTPI in Porto city removes 261 kg of air pollutants (equivalent to 840 €), sequester 9 t of carbon (828 €) from the atmosphere and avoid 889 m³ of surface runoff (7 181 €). Simultaneously, they store in their structure 713 tonnes of carbon (€ 68 702). The results of this work highlight the need to promote management and planning practices that ensure the longevity of trees in the urban ecosystem, since there is also a social interest and long-term financial return.

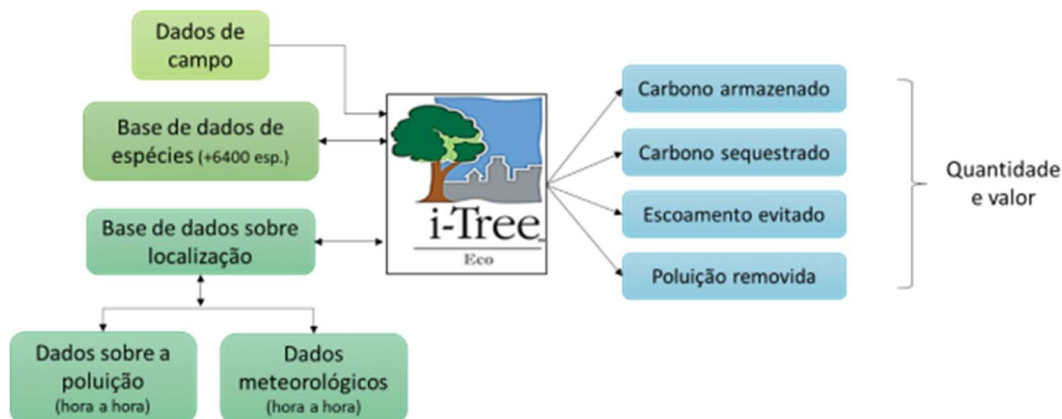


Figura 1 - Diagrama ilustrativo do procedimento do software i-Tree Eco. Adaptado de: <https://www.itreetools.org/eco/overview.php>

- **17114 | Electrophysiological Phenotype of Schizophrenia**

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Schizophrenia is a psychiatric disease that results from a cerebral disconnection, especially between frontal and temporal regions, where the communication between the neurons is compromised which, consequently, generates the symptoms characteristic of the disease. In this sense, the purpose of the present investigation is the attempt to construct an electrophysiological phenotype of schizophrenia, that is, to seek to know the pattern of neuronal communication present. To do this, the metrics used are the coherence - which measures the communication between two brain regions - and the phase - which allows observing the direction of this flow and the cerebral synchronization, analyzing also the frequency bands in each of the metrics. The investigation was carried out with a base of 26 subjects, all with a clinical condition of schizophrenia. Data from this base were compared with the normative basis of the Neuroguide. The results indicate that the most affected brain regions in individuals with schizophrenia are the frontal regions, but also the posterior regions, essentially affecting the communication between the prefrontal cortex and the occipital and parietal lobe, in predominance in the right hemisphere, and also the midline. As for the frequency bands, all are altered, with the supremacy of theta, beta and Highbeta bands, which indicates that they are mostly the fast bands that have the greatest number of alterations. There is also a pattern of hypo-coherence in the frontal and hyper-coherence regions in the posterior regions, contrary to the pattern exhibited by the phase, where there is an increase in phase delay in the frontal regions and decrease in the posterior regions. In conclusion, individuals with schizophrenia present difficulties not only in the transmission of information between two cerebral regions, but also changes in the direction of the flow of this information.

- 17115 | Internationalization Strategy – geographic diversification vs. concentration: the case study of a Portuguese multinational firm
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This study aims to explain the strategic motivation underlying the decision of expanding to a new market versus intensifying its presence in a previously explored market. With this goal, this study investigates the case of a Portuguese multinational company with fifteen years of international experience.

Thus, we propose to study the motivations behind the question of geographic concentration vs. geographic diversification of the firm, by using the Strategy Tripod framework presented by Peng, Sun, Pinkham, and Chen (2009), which argues that a firm's strategy depends on three complementary perspectives: the industry-based, resource-based and institution-based views.

This study can be relevant in two aspects. First, it studies the firm's internationalization through the geographical diversification and/or geographic concentration of its presence, a subject not much studied in the context of international strategic management. Second, it explores the key factors that influence the company's decision to either consolidate its business in the geographies where already is present or to enter new foreign markets at a given time. The focus is not on the impact of internationalization on the firm's performance -as most studies do - but instead, on the motivations behind internationalization.

Keywords: internationalization; geographic concentration; geographic diversification; strategy tripod; international strategy.

- **17116 | Export Barriers vs The Perception of Cluster's Advantages**

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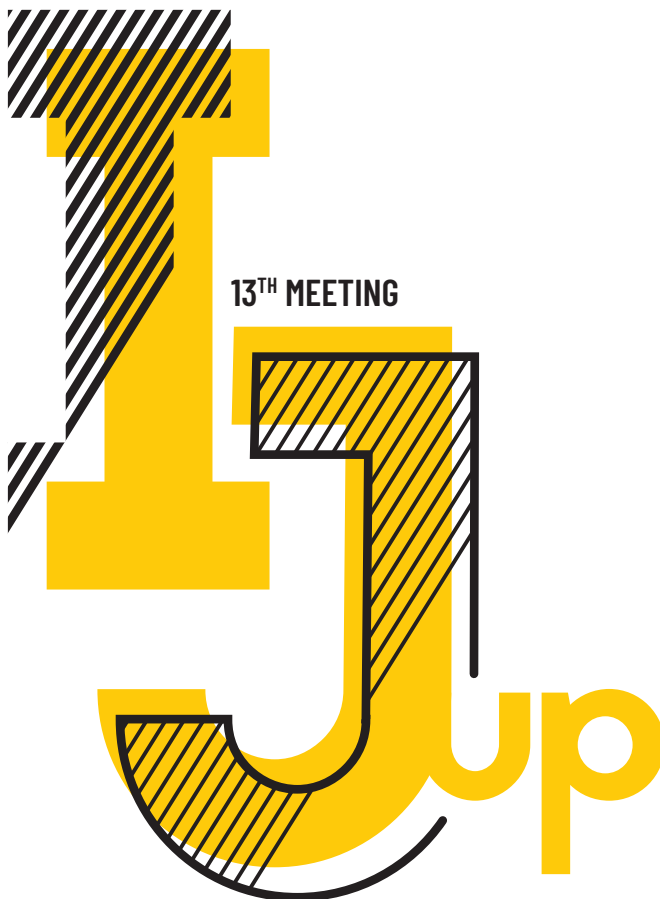
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Nowadays, internationalization is increasingly a strategic option for companies, with export being the most used way to start this process. Small and medium-sized enterprises in particular face difficulties during the initiation and development of the export process due to their structure and limited capacity and resources. These issues have been particularly studied in the context of export barriers. The cluster plays an important role in the process of internationalization of SMEs, since it creates an environment that enhances the competitive advantages of the companies installed in it. In this context, this research aims to infer the perception that exporting companies, located in the municipalities of Paços de Ferreira and Paredes, have regarding the advantages of furniture cluster, when they face export barriers. Given the lack of similar studies, a theoretical framework for analysis was developed by establishing a parallelism between export barriers on the one hand and the advantages that the cluster can offer companies on the other. This approach resulted in two research support matrices and a set of hypotheses. For data collection a survey was applied to the exporting companies of this cluster. Additionally, and to achieve the objective of the study, a probit model was used. The results of this study allow us to identify the main difficulties faced by exporting companies in this cluster and also to identify the advantages that the cluster has provided to companies. In addition, it is also possible to identify the kind of help companies need to overcome export barriers, depending on their size and international experience.

Keywords: Internationalization; Export Barriers; Clusters; Competitive Advantages; Furniture Industry

JEL-Códigos: L68; M16.

POSTER SESSIONS



- 16545 | *Hibiscus sabdariffa* L. flowers: approaches to phytochemical diversity and promising antioxidant effects

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Since the dawn of human evolution, the natural matrices proved to be excellent sources of compounds with various uses, the latter being of pharmacological or dietary nature. Thus, it is important to explore and validate the most diverse species in the World, in order to decode their phytochemical composition and their biological activities.

The goals of this work are to study the chemical composition and antioxidant capacity of the the flowers of *Hibiscus sabdariffa* L. through the analysis of its ethanol extract.

The extract was analyzed by HPLC-DAD and GC-FID for the identification of phytochemicals and the antioxidant activity was evaluated by DPPH[•] and [•]NO sequestration assays.

With HPLC-DAD analysis we were able to identify several phenolic compounds (such as 3-O-caffeoylquinic acid, 5-O-caffeoylquinic acid, quercetin, delphinidin and a cyanidin heteroside. GC-FID enabled the detection of 11 fatty acids, the major ones being elaidic acid and palmitic acid.

As for the antioxidant activity against the DPPH[•], we found that it depends on the concentration against [•]NO.

Thus, the ethanol extract of *H. sabdariffa* contains compounds with antioxidant activity. The study of other extracts, obtained using solvents with different polarities, would allow to extend the knowledge on the actual potential of the species.

This work was developed within the optional curricular unit "Bioactivity of Natural Matrices" of the 4th year of the Master Degree in Pharmaceutical Sciences of the Faculty of Pharmacy, University of Porto, under the responsibility of Paula Andrade (Head) and Patrícia Valentão.

- 16546 | Providing knowledge on an Asian natural matrix: *Citrus japonica* Thunb. stems

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Over the years, medicinal plants have historically proven their value as a source of molecules with therapeutic potential and today they still represent an important set for the discovery and identification of new drugs. Currently, there is a major interest from the scientific community in finding drugs from natural sources, like plants [1].

Citrus japonica Thunb. is a small perennial tree, that is native from the south Asia and Pacific-Asia regions. The purpose of this investigation is to study the chemical composition and antioxidant activity of the ethanolic extract of *C. japonica* stems, a part of the plant remotely studied. HPLC-DAD chromatographic analysis of the extract revealed the presence of several carotenoids, chlorophyll a derivatives (pheophytin a and derivatives) and phenolic acids (hydroxycinnamic acids). The fatty acid profile of the extract, detected by GC-FID, showed the presence of 8 fatty acids, being C18: 1, cis-9 (oleic acid) the most abundant. In order to evaluate the antioxidant activity, two assays were performed: scavenging capacity for the DPPH radical (1,1-diphenyl-2-picryl-hirazyl) and for the NO (nitric oxide) radical. The extract displayed a reduced activity against DPPH, despite being dependent on the concentration. A stronger effect was noticed against NO. This is the first study on the stems of *C. japonica*. Despite the reduced antioxidant effect, it points to the importance of continuing to explore natural matrices, namely those whose value is not known yet.

This work was developed within the optional curricular unit "Bioactivity of Natural Matrices" of the 4th year of the Master Degree in Pharmaceutical Sciences of the Faculty of Pharmacy, University of Porto, under the responsibility of Paula Andrade (Head) and Patrícia Valentão.

[1] Atanasov, A., et al. (2015). Discovery and resupply of pharmacologically active plant-derived natural products: A review. *Biotechnology Advances*, 33(8), pp.1582-1614.

- **16547 | *Porphyra linearis*: a new source of bioactive compounds?**

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Natural products have always played an important role in the treatment of human diseases, despite the origin of the bioactive compounds. Today, natural matrices continue to be explored as sources for new compounds, given its major presence in the market. The least exploited natural products are the marine one's. The organisms from which these compounds are extracted have developed survival mechanisms for their environment, namely in terms of light, salinity and pressure. Those mechanisms generally involve the production of secondary metabolites that frequently are bioactive.

This study focuses on the chemical and bioactivity characterization of *Porphyra linearis* Greville, a red macroalgae found in the upper intertidal and splash zone of exposed shores of the Atlantic. An ethanol extract was prepared and subjected HPLC-DAD and GC-FID analysis and evaluation of scavenging capacity of DPPH and NO. radicals.

Besides, carotenoids and phaeophytin a, fifteen fatty acids were detected, C16:0, C18:0 and C18:3 being the most abundant. Concerning the antioxidant capacity, the extract displayed no scavenging effect against DPPH radical, but a concentration-dependent one against NO radical. Given the high quantity of omega fatty acids, this algae may be used as a dietary supplement and free radical neutralizer, thus boost overall health.

This work was developed within the optional curricular unit "Bioactivity of Natural Matrices" of the 4th year of the Master Degree in Pharmaceutical Sciences of the Faculty of Pharmacy, University of Porto, under the responsibility of Paula Andrade (Head) and Patrícia Valentão.

- 16548 | New approach to the use of *Citrus Japonica* Thunb. leaves

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Over the years, Asia has deepened the therapies that have a plant matrix, as they have long been used in the prevention and treatment of Human diseases. To this date, plants have had a great importance in the discovery of new compounds with biological activity allowing the creation of new medicines, being remarkable the importance of all studies done in this area. *Citrus japonica* Thunb. is a tree from South Asia and Asia-Pacific regions, being used for its fruits and for medicinal and therapeutic purposes. Its anti-inflammatory, carminative, expectorant and deodorizing effects have already been confirmed. This study aimed to know a little more about *C. japonica*, with a special focus on its leaves, by characterizing the chemical composition and evaluating the antioxidant activity of an ethanol extract.

The extract was analyzed by HPLC-DAD and GC-FID for the determination of phytochemicals, and the antioxidant activity was checked by DPPH and NO radicals scavenging assays. GC-FID analysis allowed the identification of 10 fatty acids, methyl cis-9-octadecenoate being the main fatty acid. HPLC-DAD analysis revealed the presence of several carotenoids (xanthophylls and carotenes), chlorophylls and phenolic compounds (phenolic acids, flavanones and flavones). The extract showed concentration-dependent antioxidant activity for both DPPH and NO. According to our results new therapeutic and medicinal uses can be foreseen.

This work was developed within the optional curricular unit "Bioactivity of Natural Matrices" of the 4th year of the Master Degree in Pharmaceutical Sciences of the Faculty of Pharmacy, University of Porto, under the responsibility of Paula Andrade (Head) and Patrícia Valentão.

- 16550 | Exploring the oceans with *Isochrysis galbana* Parke: Bioactivity and chemical characterization

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Given the development of new technologies of growth, in the last years an increasing amount of studies on the applications of seaweed in food and pharmaceutical industries were performed.

Microalgae are photosynthetic microorganisms with an important role as primary producers in most aquatic food chains. They are potential sources of natural compounds for several biotechnological and therapeutic applications. Attending to these facts, we believe in the importance of the biological and chemical characterization of the microalgae *Isochrysis galbana* Parke. *I. galbana* is a brown microalga that belongs to the phylum Haptophyta. Due to its capacity to grow with little requirements and in extreme environmental conditions, this microalga has received the interest of the scientific community. The present study aims to provide information about the chemical composition and biological activity of an ethanol extract of *I. galbana*. For the identification of phytochemicals, the extract was analysed by reversed-phase HPLC-DAD and GC-FID. Microassays were used to evaluate its antioxidant capacity against DPPH and nitric oxide radicals and the effect on tyrosinase.

GC-FID analysis allowed the identification of a variety of fatty acids, including saturated, like palmitic acid, and polyunsaturated, as linoleic acid. Fucoxanthin chlorophyll a and c derivatives were detected by HPLC-DAD.

Regarding bioactivity, no effect was observed against DPPH radical, but the extract was able to scavenge NO radicals and to inhibit tyrosinase in a concentration-dependent manner.

The results point to the potential application of this extract in both food and cosmetics industries.

This work was developed within the optional curricular unit "Bioactivity of Natural Matrices" of the 4th year of the Master Degree in Pharmaceutical Sciences of the Faculty of Pharmacy, University of Porto, under the responsibility of Paula Andrade (Head) and Patrícia Valentão.

- **16554 | Contributions to think university extension: The case of school consulting**
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"Scholarship has to prove its worth not on its own terms but by service to [the local], the nation and the world" (Boyer, 1990: 23). Thus, this research aimed to systematize, understand and reflect on the social and scientific role of university extension within the scope of school consulting.

Participant observation was conducted across 6 months (in 10 schools, 1 faculty and 1 research center) and data collection was carried out through field notes (100), structured interviews (1 school teacher and 1 scholar) and informal interviews (30 school teachers, 10 scholars and 10 researchers) (Amado, 2017). The results were discussed in the light of broader theoretical perspectives.

The research allowed to frame 5 lines of the action of school consultants:

- o promotion of collaborative practices among educational actors through the co-construction of dialogue channels and the mediation of relations;
- o promoting a culture of continuous improvement, playing a role of «development monitor» and providing resources;
- o work with people rather than intervene on them;
- o contribute to the development of ideas and an overview of the school, rather than applying «external formulas»;
- o and be a mediator between the accumulated knowledge about a certain aspect and the educational actors that incorporate it in their practices.

Thus, a new framework for the action of school consultants was built: a hybrid perspective of the consultant as an expert and as a critical friend - hybrid school consulting.

Briefly, a ground-based definition of school consulting was systematized. It was also observed that extension activities have a symbiotic relationship with research, allowing academics to become mediators between scientific knowledge and social practices. Thus, extension, when based on research that perceives it as a way to action-research with local actors, and research, when perceived as extension with a purpose to produce local advantageous knowledge, have a transformative potential.

- 16557 | *Sargassum muticum* (Yendo) Fensholt (Ochrophyta, Fucales): From invasive macroalgae to biotechnological opportunity

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Marine biological invasions have considerable ecological and economic impact. However, these threats can arise as valuable opportunities for obtaining bioactive compounds to be applied at various levels, namely in the pharmaceutical and nutraceutical sectors. *Sargassum muticum* (Yendo) Fensholt (Ochrophyta, Fucales) is described as one of the most aggressive among invasive seaweeds, being widely spread along the European Atlantic coast [1].

This work aims to explore the antidiabetic potential of both untargeted and phlorotannin-targeted extracts from *S. muticum* harvested in the Portuguese coastline.

Both *S. muticum* extracts displayed antiradical effects against DPPH• and nitric oxide (•NO), also reducing the generation of advanced glycation end-products (AGEs). Moreover, the extracts inhibited the activity of the carbohydrate-hydrolyzing enzyme α -glucosidase, in a concentration-dependent manner.

The capacity of the *S. muticum* extracts to interact with different *in vitro* targets involved in the etiology of diabetes points to the potential of this invasive seaweed species and its extracts to be incorporated in nutraceuticals and/or pharmaceuticals for glycemic control and to avoid diabetes-related vascular complications associated to oxidative stress.

[1] Puspita et al. (2017) J Appl Phycol 29: 2521–2537.

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- 16562 | Linguistic vectors for the discursive force: analysis of a discourse present in Saramago's *Ensaio sobre a lucidez*

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In José Saramago's *Ensaio sobre a lucidez*, a dialectical structural principal persists assuming a specific ideological positioning within the fictional universe of the novel. Adopting as a paradigm for the study of the literary text a dialogical perspective, we selected as our object of analysis a discourse of the character "prime minister" of this work of Saramago in the context of the elections that took place in the capital of a fictional country. Our central objective was to isolate a set of enunciative recurrences in order to study the mechanisms mobilized by the writer for the construction of the discursive force. Thus, using as a starting point the theoretical and conceptual framework of Discourse Analysis, and the digital tool *Corpógrafo* to search for relevant repetitions, we analysed the dominant semantic-axiological axes in the discourse, particularly the strategies that preside over the construction of subjectivity and the articulation of dialogism, polyphony and intertextuality with the pragmatic goal of irony. We noted that linguistic vectors such as the epistemic modality of certainty, the assertive, commissive and directive acts of threat/recommendation and the lexemes that inaugurate a negative world view, dividing the "I" (prime minister) and the "Others" (the capital's population), reflect, in an evident way, the confrontation of various voices. All in all, these strategies guide the discursive force of the character's words.

Keywords: *Ensaio sobre a lucidez*; Discourse Analysis; discursive force; linguistic vectors; subjectivity.

- 16565 | The criminalization of the living wills: the right to dignified death under the Portuguese Criminal Law perspective

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Since the Antiquity, death has instigated and frightened peoples around the world. To justify the end of life, religious theories emerged that claimed to be the divine will. As a counterpoint, the Science and the Medicine sought sophisticated treatments to control life from the conception to the final term. Given this, many terminal patients have their lives prolonged through devices and medications that are unable to reverse the progress of their disease but prevent the natural death of the patient. The basic scientific premise of this research project is that all individuals are entitled to a dignified life from the birth to the death, regardless of how it occurs. For this, the self-determination of the terminally ill patient must be guaranteed by the contemporary law and accepted when the patient wishes, even if expressed in advance, prior to their physical and/or mental disability. Throughout this project we have explored this problem from its first discussions in the Portuguese Parliament, its impact on society, its validity requirements, its effectiveness and, in a comparative study, we relate them to the German «*Patientenverfügungen*». After exhaustive research on the Portuguese and German systems, we compared patients' autonomy considering the Brazilian, American and European realities. This research is developed by the author in the scope of research in the Master's Degree by the Faculty of Law of the University of Porto.

- 16569 | Morphological and molecular analysis of Coccidia parasites of blue whiting, *Micromesistius poutassou* (Risso, 1827)

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Coccidia infect many marine fish and can negatively impact host health and consequently cause serious economic problems. This study aimed to characterize the Coccidia parasites in the blue whiting, *Micromesistius poutassou* (Risso, 1827), by investigating their phylogenetic affinities and evaluate whether they can affect the host condition. Sixty fishes were obtained from local markets in Northern Portugal in Spring and Autumn. Fish liver, stomach, intestine and gonads were inspected for coccidiosis. Morphological and molecular analysis revealed that detected Coccidia belong to the genus *Goussia*, however it was not yet possible to determine to which species they belonged. Overall, a high parasite prevalence was found. Regarding parasite abundance, the liver was the most infected organ with significant differences from the other organs. Additionally, a significant negative relation between the abundance of the parasites in the liver and host condition index was also observed.

- **16570 | Dementia in the Emergency Department**

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Dementia is the term used to describe the symptoms that reflect the progressive decline of the cognitive and functional capacities of an individual, including also the social and emotional components. Portugal is one of the countries of the OECD with the biggest prevalence of dementia, so all the medical professionals involved in the care of these patients should be prepared to recognize the level of cognitive and functional decline, in order to better support the patients and their families during the course of this disease. Despite the high prevalence of this disease, the course of the elderly with dementia in the Emergency Department (ED) was never studied in Portugal before. This study includes patients older than 65 years previously diagnosed with dementia. With this study, we aim to understand how the level of dependence affects the course of the patient with dementia who comes into the Centro Hospitalar Universitário do Porto ED. These patients' cognitive capacities and level of dependence were evaluated through the Mini Mental State Examination, Lawton's Scale and Barthel's Index. Afterwards, the outcome seven days later was evaluated, taking into account the need of hospital stay, return to the ED and mortality.

KEYWORDS: Dementia, Emergency Department, Dependence, Cognition, Elderly

- **16571 | Ultrasound study of the fetal face in normal cases and pathological fetal development**

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The prenatal study of the fetal face integrated on the ultrasound examination routine may assist in pathology fetal diagnosis, since fetal orofacial abnormalities are typical manifestations of various chromosomal anomalies or multiple malformations. Consequently, the detection of fetal orofacial anomalies, isolated or associated with long-term malformations, inexorably expedites the planning for a multidisciplinary approach in an early postnatal phase that includes, in addition to prenatal and neonatal care, medical dentist's intervention searching to improve and optimize the eventual physical disabilities, through stimulating the normal development of the affected structures.

This study intends to understand if the studied structures - nasal bone, facial profile, superior jaw, retronasal triangle, and nasal septum - can be used as ultrasound markers in the ultrasound examination routine and if there is any significant relationship between their characteristics in some types of fetal pathology.

For the accomplishment of this research an observational and descriptive study based on the ultrasonographic evaluation from a sample of 110 fetuses, from normal pregnancies or with fetal pathology, that performed ultrasonography of prenatal screening, by medical prescription, in the Unidade de Diagnóstico Pré-natal do Centro Hospitalar de Vila Nova de Gaia/Espinho, EPE during the second trimester of pregnancy.

For the analysis of the pretended orofacial anatomic structures specific criterias were defined for the aquisition of the ecographic plan and respective biometrics.

The results obtained in the scope allow a more detailed evaluation of the fetal face, being able to have utility and clinical applicability in the early diagnosis of congenital anomalies.

Specially in Dentist context the early diagnosis and the ultra-sonographic characterization of some pathologies associated with orofacial manifestations may help in the planning of later treatments.

- **16578 | Efficacy of repurposing drugs in breast cancer therapy**

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According to the World Health Organization breast cancer is the most common cancer among women, corresponding to the second cause of death by cancer. Being the primary cause of mortality in women on the age gap of 45 to 55 years, it is estimated a 12% risk for women to develop breast cancer in their lifetime. About 1% of all breast cancers occur in man. In Portugal, annually about 6,000 new cases of breast cancer are detected, and 1,500 women die of this disease, according to Portuguese league against cancer.

One of the major problems of combating cancer is the prevalent increase of resistance to therapies. Being the breast cancer an heterogenous disease, the existing therapies and responses to that same therapies are numerous and not always effective. As a potential solution is proposed the repurposing of drugs, instead of developing drugs de novo for example. The goal is to search for new medical treatments within the drugs available, for other medical indications, to be used in breast cancer treatment. Providing safe and tolerable treatments to patients. Since the development of new drugs requires substantial costs and takes a longer time in accessing safety and efficacy.

This project consists in assessing the viability of MCF-7 cells treated with repurposed drugs in 24h and 48h studies, in comparison with the viability of cells treated with reference drug for breast cancer. The repurposed drugs showing better efficacy were combined with the reference drug to assess if the effects of the combination have greater outcomes than the use of those drugs individually. Furthermore, the best combinations were also tested against normal cells (MCF-10A) to study the toxicity.

- 16586 | Apicomplexa parasites of the European pilchard, *Sardina pilchardus* (Walbaum, 1792) from Portuguese waters

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Apicomplexa are obligate parasites of vertebrate and invertebrate hosts responsible for important diseases. The European pilchard, *Sardina pilchardus* (Walbaum, 1792), is an important ecological and economical species, and the surveillance of diseases, as Apicomplexa coccidiosis, is of extreme importance. This study aimed to search and characterize Coccidia in sardines. Sixty-one specimens were obtained in a local market and analyzed for coccidiosis infection. Coccidia were detected in liver, stomach, intestine and gonads. Liver was the most infected organ (prevalence = 64%). Although the intensity of the infection was not determined, it was stated that it was generally low. Only four infected fish had high infected liver. The morphometric features and the molecular analysis of oocysts allowed to identify this parasite as *Goussia clupearum* (Thélohan, 1894). In the phylogenetic analysis two distinct strains were detected, closely related and sister to *G. clupearum* sequenced from the Atlantic herring.

- **16591 | Evolution of Fc Receptor-like Scavenger (Fcrls) in Mammals: an unusual history of presence and absence**

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Fc receptor-like (FCRL) molecules are a large family of receptors, homologous to the receptors for the Fc portion of immunoglobulin (FCR). Amongst this family of receptors, an unusual rodent gene was identified, Fcrls, that does not exist in the human genome. This gene is located between the Cd5l and Fcrl1 genes. The Fcrls gene, that encodes a FCRL scavenger-like receptor, lacks a transmembrane-encoding segment and includes an exon encoding a type B-SRCR domain, with relatively high identity to the N-terminal domain of the encoded CD5L receptor, which makes it unique. Scavenger receptors are surface receptors that bind multiple ligands and promote the removal of nonself or altered-self targets. The Fcrls, in mice, has been shown to be highly expressed in fat tissues and in the microglial cells. This gene has only been identified in rodents. Yet, upon further analyses of databases such as NCBI and Ensemble, we suspected that this gene is actually present in the major mammalian families and incorrectly annotated as FCRL-2 like in most organisms or simply not annotated. These sequences were obtained and aligned with the mouse Fcrls and Fcrl2 genes. Evolutionary analyses showed that these sequences clustered with Fcrls as a well-supported group and genomic analyses revealed a shared synteny among the organisms that possess this gene. Therefore we identified this gene as Fcrls and proved its presence in rodents, some carnivores (Canidae and Ursidae), bats, Arctiodactyla, Proboscidae and primitive primates. This gene has an unusual evolutionary pattern with several loss events throughout mammalian evolution as illustrated by its presence in the ancestral Bushbaby and Sunda flying lemur and its absence in most modern primates. These results show that this gene is not correctly annotated in the genome. Its evolution can be explained either by stochastic events or by loss of this gene's physiological function through replacement with genes of similar function.

- **16595 | Antibiotic resistance in people receiving home health care**

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Aging in Portugal has been a reality for several years now, and the number of people in need of home care provided by health institutions such as nursing homes and clinics has increased. This gives rise to a new focus on the spread of antibiotic resistant bacteria that poses an increased risk for infection and colonization.

The aim of this exploratory work is to detect and identify multidrug resistant bacterial (MDR) isolates in the intestinal flora of people receiving home care, giving relevance to extended spectrum β -lactamases (ESBL) producing Gram-negative bacteria, AmpC and carbapenemases. So far, 11 stool samples from elderly people who need home health care from health institutions in the Center of the country have been analyzed. All selected persons completed a questionnaire through which risk factors such as recent hospitalization, were identified.

One gram of sample was dissolved in 40 mL TSB and incubated overnight at 37 ° C. Study samples were then incubated on MacConkey agar and MacConkey agar with ampicillin, cefotaxime, ciprofloxacin and meropenem (2mg / L). Then susceptibility testing was performed using the agar diffusion. Bacterial identification was made with ChromAgar Orientation, ID 32 GN and biochemical tests.

Of 19 isolates, 17 are resistant to at least one β -lactam antibiotic, 5 are suspected of having an ESBL and 3 are suspected of having carbapenemases, the latter was confirmed by carbapenem inhibition method (CIM).

Through these results it is noticeable that people receiving home health care are a spreading niche of antibiotic resistance. In the future, all these results will be confirmed by molecular analysis by PCR, there will be a study for non- β -lactam antibiotics and there will be a study of new samples.

- 16599 | Big Data Analysis in Healthcare: An Opportunity

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Introduction: The concept of Big Data must be taken under consideration during the analysis of big volumes of data, with particular interest in the healthcare sector. Over the last years, the term Big Data has achieved a significant and, nevertheless, obvious importance in several fields, in which of those healthcare is no exception. It's in this last field that its importance has been particularly recognised due to the increasing amounts of medical digital data that overtakes majorly our ability to analyse it.

Aim: This article is aimed at presenting and discussing the different perspectives implied in the use and evolution of Big Data in science, particularly in the healthcare sector, as well as to analyse the main opportunities and challenges.

Methods: A descriptive review of the literature was conducted using PubMed (U.S. National Library of Medicine), Scopus and Google Scholar to emphasize both the positive and negative aspects of the use of Big Data in scientific investigation and innovation.

Results: Both the investigators and healthcare professionals are still far from understanding the main gains and positive outcomes coming from the usage of Big Data. Our interactions, a need underlying the human condition of sociable living beings, promote the unmeasured accumulation of data that require analysis and processing. However, at the rate of this build-up, the focus should now be set to build new knowledge through scientific methods and techniques that allow the processing of that very same information.

Conclusions: The concept of Big Data should be taken into account when analysing big volumes of data in the healthcare sector, both organised as well as unstructured. The current and future investigation in the fields of privacy are needed, having a major impact in an informed and personalized clinical practice.

The five V's of Bid

BIG DATA

Volume - crescente número de dados clínicos relevantes; monitorização contínua dos pacientes; registos através de sensores; da ordem de grandeza do zettabyte; informação armazenada em vários locais.

Velocidade - alta débito de processamento dos dados para rápido apoio à decisão clínica; tentativa de inversão da tendência para aumento do rácio volume/velocidade.

Variedade - dados recolhidos são heterogéneos na estrutura, formato e fonte; mutabilidade de conceitos e taxonomia.

Veracidade - a qualidade dos dados difere; ambientes de recolha não controlados; disponibilidade de informação para todos os outcomes

Valor - a informação e resultados extraídos são relevantes; fazer as perguntas certas; aplicação prática e interpretação do *Big Data*

Tabela 1. Os 5 V's do Big Data e as sus particularidades na área da saúde

- **16604 | Positive Development, Model of Personal and Social Responsibility and Transfer of Competences for Life: An analysis from tennis coaches**

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Assuming the central role of the coach as the agent with the most proximity and influence over the athlete, this research attempts to understand how different coaches view the influence of sports in the athlete's development.

Defining an interview based methodological approach with a qualitative basis, eight Tennis coaches were challenged to reflect on their practices - the philosophy of training, the rapport between coach and athlete, how the coach relates to other sports agents, the coach's profile, strategies implemented to make practice more dynamic and more efficient.

We framed the analysis of the coach's discourse in the conceptual context of the Positive Development of Young Men and the different stages/steps that constitute the Model of Personal and Social Responsibility.

From this analysis (similar to other studies that focus on different sports) we concluded that 1. coaches recognise sport's importance in the development of the young athlete's psychosocial skills; 2. coaches see themselves as fundamental agents capable of promoting (or able to promote?) a specific behaviour and attitude that leads to a more positive development of young athletes; 3. Although unintentional or unsystematic, coach resorts to a set of strategies that appeal to the values inherent to the sport practice/sportsmanship (eg. respect, cooperation, ...); 4. coaches identify a set of competencies/skills developed by the athletes in their practice and recognise the necessity and possibility of transferring those skills to other spheres of life (either present or future).

This research highlights the importance of having coaches that have a more holistic and purposeful approach in the development of their athletes.

KEYWORDS:

SPORTS, POSITIVE DEVELOPMENT, LIFE SKILLS, PERSONAL AND SOCIAL RESPONSIBILITY MODEL, TENNIS COACH, TRANSFERENCE

- **16606 | Metformin effect on eNOS, iNOS, ET-1, VEGF and VEGFR-2 cardiac expression on a rodent experimental model of endometriosis**

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Endometriosis is a gynecological disease characterized by extrauterine growth of endometrium glands and stroma. Besides pain and infertility, it associates with an increased risk of cardiovascular diseases. Multiple regulators of vascular function could be impaired in endometriosis, such as ET-1 (endothelin-1), a vasoconstrictor, involved in the pain pathway, NOS (nitric oxide synthase) isoforms iNOS (inducible), involved in inflammatory response and eNOS (endothelial), endothelial protective. VEGF (vascular endothelial growth factor), a mitogen and survival factor of the endothelial cells and its receptor VEGFR-2 could be affected, too. Endometriosis is hardly controlled with hormone-based therapies and we hypothesize that metformin, an insulin-sensitizing and anti-inflammatory drug could be a therapeutic option to mitigate endometriosis-associated vascular disease.

Our aim was to characterize the cardiac expression of VEGF, VEGFR-2, iNOS, eNOS and ET-1 on a mouse-model of endometriosis treated with metformin.

40 B6CBA/F1 mice were divided into 4 groups: S-sham operated, M-treated with metformin (50 mg/kg/day), E-endometriosis, and EM- endometriosis and treated with metformin. Metformin was maintained for 3 months. VEGF, VEGFR-2, iNOS, eNOS and ET-1 were detected by dual-labelling immunofluorescence on heart sections. Images were captured by an Apotome microscope (Carl Zeiss).

ET-1 expression was found in the cytoplasm of the muscular vascular cells, with a slightly higher label in groups E and EM. Both iNOS and eNOS were identified on endothelium and endocardium of all the groups. VEGF was detected on the cytoplasm of the muscular vascular cells and myocardium next to the endocardium. Its receptor, VEGFR-2 was observed on the endothelium, endocardium and in some muscular vascular cells.

This work established the expression pattern, on a qualitative approach, of several proteins involved in the vascular response to endometriosis in the heart.

- 16609 | Effects of a physical exercise program on bone metabolism of obese patients undergoing bariatric surgery.

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Bariatric surgery (BS) is the most effective treatment for severe obesity. Nevertheless, bone loss is a commonly reported adverse event after surgery. Physical exercise has a potent osteogenic effect and promotes bone health benefits. However, only a limited number of studies has investigated the effectiveness of an exercise program on the prevention of bone loss after BS. This study aimed to evaluate the effect of BS on bone mineral density (BMD) and to determine if an exercise program could mitigate bone loss after BS. Patients were randomized into an intervention (GEx) or control group (CG). CG patients received only the usual medical follow-up. GEx patients participated in a multicomponent exercise program (3x/week; 75min/session) in addition to the usual medical follow-up. BMD (DXA) and bone strength index (BMSi; OsteoProbe®) were determined before, 1 and 6 months after BS. To assess the short-term effect of BS, a t-test of paired samples was performed. A 2-way repeated measures ANOVA was also performed to compare the CG and GEx between 1 and 6 months after BS. One month after BS, there was a significant reduction in femoral neck BMD ($p = 0.047$). At 6 months after BS, femoral neck BMD continued to decrease significantly and there was also a significant reduction in total hip and lumbar spine BMD ($p < 0.001$), in both groups. However, GEx showed a significantly less severe BMD loss at the lumbar spine. A sub-analysis showed that, in patients with an intervention program attendance rate $\geq 75\%$, the exercise program promoted a significant increase in lumbar spine BMD at the study endpoint. Regarding BMSi, no significant changes were found in either CG or GEx. In conclusion, BS caused a significant loss of BMD in all skeletal regions analyzed. A supervised multicomponent exercise program was not only effective in attenuating lumbar spine BMD loss, but also promoted lumbar spine BMD increases in patients with higher levels of adherence to the exercise program.

- **16612 | Perishable constructions in the Prehistory-Iron Age of the North of Portugal: an interplay between people, landscape and raw materials**
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Regarding Late Prehistory and Iron Age walled enclosures and settlements, several authors of the NW of the Iberian Peninsula have come to recognize the importance of constructions in perishable and raw materials (soil, wood, fibers and water), whether combined or not with traditional materials (stone). However, none enlight that question in a pertinent manner like how the relation of the people with their surrounding territory have been developed, not only when it comes to extraction and transport of the raw materials, such as water, wood, soil or stone, but also concerning the seasonal cycles of the construction process itself, the organization of people at each step of construction, and even the necessary relationship of local communities to one another in the sharing of "building materials" whose extraction rights would eventually be negotiated. This project focuses on the study of the "uses" of earth during pre-roman times, having the Crasto de Palheiros (Murça, Portugal) as a case-study. This one emphasizes the study of the perishable earthen architecture, with its inherent plasticity, and its perishable raw materials from Chalcolithic to Iron Age occupations. Taking the results of this project as a stepping stone, we will relate the morphological study of constructing clay fragments, (with or without branch imprints recovered from Crasto de Palheiros), together with the laboratory analysis of samples of building clay, (where particular components were identified) with some, ethnographic studies of the regional constructions where those traditions of building still remain. Particular emphasis will be given into models of the use and sharing of territory by local communities, namely in the exploration and sharing of water, soil and timber, and in the continuity of behaviors and some constructive techniques between Prehistory and Protohistory, in order to destroy the traditional academic boundary between these two chronological-cultural periods.

- 16614 | Pollen AGPs in development and fertilization - obtention and characterization of *Arabidopsis thaliana* quadruple knock-out/down mutant *agp6agp11agp40agp23*

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Arabinogalactan proteins (AGPs) are complex proteoglycans present in the cell wall of almost all plant tissues. AGPs are a family of non-enzymatic proteins characterized by their heavy glycosylation comprising sugars such as arabinose and galactose. These proteins participate in numerous processes throughout the plant lifespan. Strikingly, AGPs may have an important role in the signaling mechanisms underlying reproductive organs development and plant fertilization. AGPs are involved in the complex interactions between the pollen and the female reproductive tissues from pollen germination in the stigma, through pollen tube growth along the style and transmitting tract, up to the entrance into the embryo sac and release of the sperm cells leading to ovule double fertilization and finally to seed formation. The molecular features of AGPs, namely their anchorage in the cell membrane and their glycosidic moiety, favors their role as interplayers for the signaling mechanisms fundamental for pollen grain development and pollen tube growth through female reproductive tissues.

The pollen grain and the pollen tube of *Arabidopsis thaliana* have a very particular sub-set of AGPs with four of them being exclusively expressed in these organs, AGP 6, AGP 11, AGP 40 and AGP23. Both the double mutant *agp6agp11* and the triple mutant *agp6agp11agp40* have been characterized previously and both show a strong phenotype (stronger in the triple mutant). In these mutants pollen grains collapsed, pollen tube length is reduced and the siliques are shorter with fewer seeds. The objective of my project is to obtain and characterize the knock-out/knock-down *agp6agp11agp40agp23*. The mutant *agp6agp11agp40agp23* was obtained through floral dip by dipping the *agp23* knockdown mutant obtained by the RNAi technology and transforming the already existing triple mutant *agp6agp11agp40*.

- **16624 | Porto Public Art Map: a Decolonial Perspective**

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The Porto Public Art Map is a map that catalogs the main works of the city, benefiting and supporting art practices. However, by observing carefully, it is possible to notice colonial thoughts rooted in its making. I propose, then, a discussion using the critical theory of decoloniality, also due to the increasing immigration of people from ex-Portuguese colonies.

I look more deeply into the analysis of two statues. First, the statue of Conde de Ferreira that was a meritorious and slave trader, and also reflecting about recent events in the demonstrations in Chile and the consequent destruction of two statues in Santiago of Spanish colonizers Francisco Aguirre e Pedro Valdivia. Secondly, I analyze the Monumento ao Esforço Colonizador Português and make a comparison with a statue in São Paulo, Brazil called Monumento às Bandeiras. Both monuments were vandalized in similar ways. In the end, I give a brief report about the situation of immigrants in Portugal, specially the black ones and give my opinion about the importance of decolonization of these monuments in relation to history and society.

This essay aims to address these points, exploring the inconsistency of an innovative project (the Public Art Map) and at the same time surpassed by colonial issues through the analysis of works of art from the city of Porto.

- 16626 | Effects of different concentration of *Rhodopirellula rubra* on *Daphnia magna* performance

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Amongst the many model organisms employed in ecotoxicological research, *Daphnia* spp. stands out as being widely used as a high quality bioindicator in environmental studies. *Daphnia magna*, in particular, has shown to be an excellent model organism in experimental research. Previous studies have already demonstrated that the planctomycete *Rhodopirellula rubra* is a good supplementary food source for *D. magna* diet. It improved body size and the fecundity with anticipation of the age at first reproduction. This study aims to understand the effect of two bacterial concentrations (the one previously tested and its double) in the performance of *D. magna* life history parameters. The bacteria will be supplied as single or supplementary food source (standard diet - *Rhaphidocelis subcapitata*). A 21 days feeding assay will allow to evaluate the adequacy of these diets in the life history parameters and glycogen, protein and FAMES.

- **16629 | Synthetic studies towards fumiquinazoline G**

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In recent years, marine natural products have emerged as attractive candidates for drug development because of their diverse range of biological properties [1]. Particularly, alkaloids containing a pyrazino[2,1-b]quinazoline-3,6-dione core linked to an indole moiety, such as fumiquinazolines and fiscalins, have been key players for further chemical modifications in order to improve their antibacterial spectrum [2]. Neofiscalin A exhibited potent antibacterial activity against *Staphylococcus aureus* and *Enterococcus faecalis* (MIC = 8 µg/mL) [3]. To date, total synthesis of neofiscalin A has not yet been achieved due to its intricate stereochemistry, mainly in the tryptophan moiety. The search for new compounds with simplified structures and synthetic methodologies with enhanced biological activities is a current challenge in organic and medicinal chemistry.

Herein, we report the synthetic steps towards fumiquinazoline G, a secondary metabolite isolated from a fungus separated from a *Pseudolabrus* fish, following a multi-step approach [4] using anthranilic acid, D-tryptophan methyl ester hydrochloride, and Fmoc-D-Ala-Cl. Synthetic details, as well as structure characterization (by 1D and 2D NMR studies) of fumiquinazoline G and intermediary compounds, will be presented and discussed. Future work will consist on the development of a library of fumiquinazoline derivatives in order to achieve compounds with enhanced antibacterial activity.

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- 16630 | The influence of Relative Age Effects in physical conditioning of youth male volleyball players

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The purpose of this study was to analyse the influence of Relative Age Effects in physical conditioning of youth male volleyball players. A total of 152 players from seven different Portuguese volleyball clubs were examined. The players were grouped into four age categories (minis, infantile, beginners and juvenile). Their birthdates were categorized in four different quartiles: quartile 1 (January-March), quartile 2 (April-June), quartile 3 (July-September) and quartile 4 (October-December). The players were examined on the following physical conditioning tests: 5m/20m/30m Velocity, Foot Tapping, Agility, Sit-ups, Medicine Ball Throw and Horizontal jump. One-Way ANOVA was used to examine the variables. Post hoc analyses were conducted using Bonferroni tests and effect sizes were determined using eta-squared values. The results showed that older athletes performed better in the majority of the tests. More specifically, the older athletes achieved a better performance in the 5m Velocity test ($p<0,000$), 30m Velocity test ($p<0,000$), Foot Tapping test ($p<0,000$), Agility test ($p<0,000$), Sit-ups test ($p<0,000$), Medicine Ball Throw test ($p<0,000$) and Horizontal jump test ($p<0,000$). The exception was the 20m velocity test in which were not observed statistical significant differences between the groups. Concerning to the Relative Age Effects, the results of this study did not showed any significant differences between the groups for physical tests analysed. These findings suggested that the older the player is, the better their performance in physical conditioning tests is observed. Also, the Relative Age Effects are not a key influencing factor on physical performance in these players.

Keywords: relative age; physical conditioning; youth sport; volleyball

- 16645 | Study of mercury concentration in sardines of the Portuguese coast (*Sardina pilchardus*)

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The fishing sector is very important, especially for the developing countries, representing, in some cases, more than half of the total value of the marketed goods. Since fish consumption has steadily increased, *Sardina pilchardus* represents a commercially important species, making it one of the largest fisheries resources in our country. With regard to the accumulation of the metals, ingestion of food with high mercury concentrations may lead to the accumulation of this metal in vital organs and furthermore impair the nutritional benefits of fish. In humans most of the contamination comes from eating fish and seafood. In this way, prolonged exposure to mercury is unfavorable to human health, especially in the growth of fetuses and children.

This report is divided in two distinct groups of samples, a group referring to the sardines obtained in a supermarket in Matosinhos, coming from the Portuguese exclusive economic zone in the northeast Atlantic and another one related to the sardines bought in the fish market in Vila do Conde, that were captured in the north coast of Portugal.

The results showed that all samples from the sardines had a mercury concentration of $<0.1 \text{ mg / kg Hg}$, a value below the limit imposed by the law decree (less than 0.3 mg / kg of moist meat). It should also be noted that, in relation to the amount of mercury analyzed, there was no difference between samples from the supermarket and the fish market.

Finally, it is concluded that sardine enthusiasts, *Sardina pilchardus*, can consume without concern about the amount of mercury, obtained after the analyzes performed.

- 16647 | Comparative study of microemulsions for cutaneous administration of proteins

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Proteins and peptides have different effects on the skin, especially for cosmetic purposes, but an important limitation to use them topically is their ability to penetrate the skin. Therefore, the main function of a system for topical administration is to increase the dermal permeability of the proteins/peptides by allowing them to cross the epidermis.

This work aimed to develop and compare Oil-in-Water (O/W) and Water-in-Oil-in-Water (W/O/W) microemulsions for cutaneous administration of peptides and proteins. Microemulsions contained in their composition isopropyl myristate as the oil phase and also as skin penetration enhancer, surfactants (Tween® 80 and Span® 80), glycerine as co-surfactant, and bovine serum albumin (BSA) as a model of a protein. The microemulsions were evaluated regarding accelerated stability by centrifugation, and droplets size of the inner phase, pH, and albumin content, over 30 days of storage at room temperature. Microemulsions were subsequently gelified to improve their consistency and facilitate their application to the skin. Then, the microemulsions gelified were characterized regarding their texture (firmness and adhesiveness) and rheological behavior.

Both types of microemulsions showed no phase separation after centrifugation and a slight decrease in pH after 30 days. Unlike O/W microemulsions, W/O/W microemulsions maintained internal phase droplet sizes over 30 days. However, W/O/W microemulsions showed a higher decrease in the BSA content during storage, comparing with O/W microemulsions. The microemulsions gelified showed similar texture and rheological properties, but suitable for skin application.

Key words: Microemulsions; Protein delivery; Skin administration

- 16649 | Impact of defatted mealworm larvae meal in European seabass (*Dicentrarchus labrax*) flesh quality

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The expansion of aquaculture sector and overexploitation of marine resources led to a global decrease in fishmeal (FM) availability and consequently to the increase of its price, challenging the feed industry to find new alternatives to this ingredient. The insect meal (IM) is a rich source of protein, with well-balanced amino acid profile, lipids and vitamins, and was approved by European Union in 2017. Moreover, insects require less water, energy and arable land when compared to other feed ingredients conventionally used in aquafeeds. They can be produced in waste from industries, reducing environmental contamination and increasing the waste value, contributing for a circular economy.

This work aims to evaluate the feasibility of replacing fishmeal (FM) by increasing levels (0, 50 and 100%) of defatted mealworm larvae meal in European seabass (*Dicentrarchus labrax*). Each dietary treatment was assigned to quadruplicate homogeneous groups of 15 fish that were fed ad libitum for 16 weeks. Fish were subjected to a 12-hour light/12-hour dark photoperiod regime and kept in a recirculating saltwater system (35o/oo, 22 ± 1°C).

At the end of the growth trial, several flesh quality traits were assessed in 12 fish per treatment. The nutritional value of the fillet was evaluated after chemical determination of total lipids and fatty acid profile. The fillet colour was measured instrumentally with a CR-400 colorimeter (Konica Minolta) using the CIE L*, a* and b* values, and the texture (hardness, adhesiveness, springiness, cohesiveness, chewiness and resilience) was evaluated using a Texture Analyser. Results will provide new information concerning the impact of the dietary inclusion of defatted mealworm larvae meal in European seabass fillets.

Work supported by the Project ANIMAL4AQUA, funded by Portugal 2020, financed by the European Regional Development Fund (FEDER) through the Operational Competitiveness Program (COMPETE) - POCI-01-0247-FEDER - 017610.

- 16653 | The attack with the “Desert Goal” in 2018 European Seniors Men’s Handball Championship. Frequency and efficacy of those actions in function of the numeric relation.

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The last changes in the Handball rules have had decisive repercussion in the tactical behaviour of the teams in competitions. The possibility of a team playing without a goalkeeper, introduced in the Olympic games in 2016, made a lot of teams to change their offensive strategy, either in situations of equality, or in the numeric inferiority. For the fact that this situation is still recent, there are a few researches approaching this theme, it is really necessary to analyse this subject, with the aim of understanding the real repercussion coming from this change, taking into consideration that this was the first championship in Europe with the new rule in force.

To analyse and describe the behaviours of the victorious and defeated teams in situations of attacks without goalkeepers, as well as to evaluate the efficacy to identify eventual difference between them.

Register of 47 matches in 2018 European Seniors Men’s Handball Championship, 3 matches which finished tied were not analysed, with the total of 44 matches, collected through the observation tool named *adhoc*. Data analysis with the resource of measures of frequency and percentage were considered.

It is verified that the frequency of the use of more than one player in the attack (originated from the substitution of goalkeepers) occur more regularly in situations of 7x7 to attack in numeric superiority (7x6) and after the exclusion of a player, to play in numeric equality (6x6). It is noted that in the situations of 7X7 the victorious team obtain a superior efficacy in attack compared to the defeated ones (65.9% vs 46.2%). In situations where the teams have less than one player (the extra player recover the equality in the attack), the victorious team are also more efficient than the defeated ones (52.7% vs 40.9%).

The current research indicts that in the attack with desert goal, the victorious team have less frequency of the use of this strategy, but they obtain more efficacy when they do it.

- 16657 | Comparative analysis of the entomofauna (Insecta: Coleoptera and Hemiptera) of Parque Oriental da Cidade do Porto and the Ferreira river valley at Couce (Valongo)

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With over a million species worldwide and inhabiting nearly all types of habitats, insects play numerous and vital roles that allow for the normal functioning of their ecosystem, but much is still to discover, namely in the Porto region (Portugal).

Species from some Coleoptera and Hemiptera target-families of were inventoried at Parque Oriental (Porto) and Couce (river Ferreira valley). In each site three subsamples were obtained monthly, using a sweep net, during a complete annual cycle. All specimens were identified to the species level. We analyse α -diversity and β -diversity (modified Jaccard index). Species presence was also used to analyse their annual phenology.

We identified 50 species (17 families) at Couce and 51 species (19 families) at Parque Oriental. The presence of *Triplax lacordairii* Crotch, 1870 (Coleoptera: Erotylidae) was detected for the first time in Portugal and the known distribution range of *Pogonocherus perroudi* Mulsant, 1839 (Coleoptera: Cerambycidae) was enlarged for Portugal. The presence of three exotic species is noted with concern. The evolution of α -diversity at Couce showed an expected annual pattern; at Parque Oriental an unusual amount of Hemiptera species was registered from September through February. β -diversity for the number of species ($J_i=75\%$) reveals differences between the two sites, unlike the number of families ($J_i=46\%$) that points out to less pronounced inter-site differences. Analysis of phenology revealed that for some Hemiptera and Coleoptera families (found at least in six occasions) their presence agrees with the annual cycle described for those families.

Despite focusing in a restricted area and a restricted number of Coleoptera and Hemiptera families the results are an important contribution to the regional insect fauna knowledge. Other sampling methods, more frequent sampling and the analysis of more variables may allow for a better knowledge of Portugal's entomofauna in future studies.

- 16658 | Anti-inflammatory functionality of Karonda (*Carissa carandas* L.) and Djenkol (*Archidendron pauciflorum* (Benth.) I.C.Nielsen): In vitro evidence and identification of bioactives

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Due to an abundant biodiversity, Thailand is widely reputed as a geographic reservoir of tropical fruits. In addition to their nutritional value, Thai fruits are known to be a rich source of bioactives, frequently underlying relevant biological activities such as antioxidant, antidiabetic and anti-inflammatory properties.

During our ongoing research programme on the biological properties of Thai fruits, methanolic extracts obtained from *Carissa carandas* L. and *Archidendron pauciflorum* (Benth.) I.C. Nielsen were selected in order to investigate their anti-inflammatory effects. While *C. carandas* fruit extract proved to significantly interfere with 5-lipoxygenase at concentrations ranging from 62.5 to 1000 µg mL⁻¹, the activity was solely reduced to ca. 58% at 1000 µg mL⁻¹. In contrast, the extract obtained from *A. pauciflorum* fruits solely caused a significant interference at 500 and 1000 µg mL⁻¹ but exhibiting a stronger effect (IC₅₀ = 532.6 µg mL⁻¹).

Similarly, *A. pauciflorum* fruits' extract proved be more effective on the scavenging of •NO, with an IC₅₀ value of 759.7 µg mL⁻¹, while the extract obtained from *C. carandas* could significantly scavenge the radical at the range of concentrations 250-1000 µg mL⁻¹, a reduction to ca. 66% being noted at the highest concentration tested.

HPLC-DAD phenolic profiling of purified methanolic extracts allowed to provide clues on the bioactives that might contribute to the observed bioactive properties. While *C. carandas* fruits' extract is predominantly characterized by the occurrence of hydroxycinnamic acids, the extract obtained from the fruits of *A. pauciflorum* was found to be rich in flavonoids, including 3-*O*-substituted derivatives of myricetin and quercetin.

- 16664 | The agronomic background and business models for the production systems in the city of Tondela

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The present work develops a multi-criteria methodology of agro-climatic and economic zoning to support the decision making of cultural alternatives to be installed at a regional level, taking as a case study the city of Tondela. The study of the agro-climatic potential of different crops for specific regions, such as the city of Tondela, is virtually non-existent, specifically less conventional crops, which also causes economic uncertainties in their investment. In this city and surrounding region, following the decline in the last decade of utilised agricultural land, there is currently an increase in interest in agricultural activities. The agronomic landscape of this region is similar to other regions in Portugal. In this context, the aim is to analyse from an agronomic and economic point of view methodologies for the decision of alternatives for regional agriculture.

The multi-criteria model developed in this work starts from the zoning of the agronomic potential by listing a set of type crops (activities) for which a business model to support investment is proposed. Several biophysical factors characterising the territory were assessed, such as soil, topography and climate, culminating in zoning and selection of crops/activities more adapted to the city. Subsequently, the profitability of agricultural investments on crops/activities that could potentially be installed in the city was determined. This information makes it possible to support producers in the selection of cultural alternatives at the territorial level, based on business models capable of transmitting relevant information for the establishment of agricultural activities that are efficient from an agronomic point of view, reducing the economic uncertainties resulting from the investment.

The versatility of the models and tools developed to allow us to assume that this assessment of agronomic potential and economic analysis can be generalised to other territories.

- 16676 | Behind the scenes of behavioural science in zebrafish: setup and validation of a behavioural task

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Zebrafish (*Danio rerio*) use in the laboratory has been emerging as a good animal model and a powerful tool in science in many areas, such as behavioural neuroscience. Behavioural assessment is very important in this area, where the behavioural tasks protocols' have to be validated to study different conditions and mechanisms, for example, fear learning response.

This work aims to validate a rapid and effective learning apparatus that is being custom-built using 3D printing technology and custom-made hardware and software responsible for administering electric shocks using an Arduino. The shock will be the aversive stimulus for the behavioural task based on classical conditioning - one-trial inhibitory avoidance task. The use of this aversive stimulus causes an immediate response resulting in a robust and long-lasting memory learned in one session.

The experimental apparatus consists in one aquarium with two sides (white and a black) where, during the conditioning session, the fish will receive a mild electric shock for 5 sec (5 cycles of 100ms) in the preferred side (black), followed by immersion in an amnesic bath using a compound known for inducing amnesia, MK801 or in clean water (control). After 24h, the test is repeated without the shock, with the animal starting on the white side. Latency to go to the black side and time spent on each side during the post-conditioning phase will be measured for further assessment of aversion.

The MK801 treated animals are expected to have a significant impairment on memory compared with the control group that would avoid going to the black side. These results will validate this apparatus and protocol to be used in further experiments aiming to characterize events underlying memory formation such as effects of anaesthetics prone to provoke amnesia. Furthermore, this task will serve as a complementary strategy available for zebrafish that may significantly improve our knowledge of learning and memory mechanisms in general.

- 16677 | Optical Coherence Tomography in Multiple Sclerosis patients regarding history of Optic Neuritis: a Portuguese hospital-based study

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Multiple sclerosis (MS) is a chronic inflammatory and neurodegenerative disease of the central nervous system. Optical coherence tomography (OCT) is a technique that can help the study of axonal loss. In Centro Hospitalar São João (CHSJ), MS patients with or without history of optic neuritis (ON) can do an OCT exam. Little is known about this population and their OCT results, therefore, our aim was to describe and compare these two subgroups.

We identified MS patients with an OCT exam, followed in 2019 on CHSJ. Peripapillary retinal nerve fiber layer thickness (pRNFLT) of both eyes was obtained. Patients were stratified in two subgroups, ONMS (if ON history) and non-ONMS (if no ON history). To study clinical and demographic characteristics, we considered the patient. When comparing pRNFLT, the eyes were used instead. Within subgroups, stable patients were those with no clinical relapses and no increasing lesion load in the two previous years.

We found 61 patients, 75.4% were women and the mean age was 44.0 years. There were 22 non-ONMS patients (43 eyes) and 39 ONMS patients (51 eyes), demographically and disease duration similar. Mean pRNFLT of ONMS was significantly lower than in non-ONMS, 79.32 μm and 91.01 μm , respectively ($p=0.006$). Regarding stable patients, comparing their pRNFLT with the average of the subgroup, in ONMS results were similar (stable ONMS: 83.62 μm , subgroup ONMS: 79.32 μm , $p>0.20$); in non-ONMS, stable patients had significantly lower pRNFLT (stable non-ONMS: 80.78 μm , subgroup non-ONMS: 91.02 μm , $p<0.20$).

As far as we know, this is the first Portuguese hospital-based study comparing OCT information with other clinical variables in MS. As expected, a higher atrophy RNFL was obtained in MS eyes affected by ON. A surprising result was the lower pRNFLT in stable non-ONMS patients comparing to the subgroup. Because OCT, an easy to use and non-invasive tool, can add important neurodegeneration information, we suggest more available exams in all MS patients.

- 16678 | Beauty and Scholarship in a herbarium specimen: aesthetic and scientific protocols analyses of Porto Herbaria Collections from the 19th century at the Museum of Natural History and Science of Porto University

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The search for aesthetic and artistic values in science leads to the study of the approach of the visible and tangible in botany. Can a collection of pressed plants be, not only of great scientific value, but also an artistic testimony?

The collection we lean upon in order to study these questions is a remain of the herbaria performed by students of Botany from the Polytechnic Porto Academy in late 19th century and kept at Porto University Herbarium at the Museum of Natural History and Science of Porto University (MHNC-UP).

This study includes a methodology of specimens' scientific and technical curatorship, including digitalization, re-conditioning and restoration of specimens whenever needed.

By analysing herborization protocols available at the time of these herbaria, such as of Linnaeus, Eduardo Sequeira or by the Academia das Sciencias de Lisboa (1781), we were able to verify that little or no aesthetical rules have been protocoled for the mounting of a herbarium. Although the absent standardization of herborization and taxonomy rules, there is an evident aesthetic to a herbarium sheet that can be verified, one that regards beauty and subjectivity.

A careful analysis of these herbaria sheets allowed to attest an evident aesthetic sense inherent to the mounting: the use of ribbons, decorative frames and symmetrical alignment. There are also examples of unintended simplicity or chaos, printed labels and dissected flowers. Details inherent to the 19th century period, such as ornamented calligraphy and added descriptions should also be taken into consideration.

We conclude that beautiful specimens resulting of centuries of herbaria making may have played an important historical and scientific role, back when natural history collections were a symbol of status, and may still be relevant in today's art and museology. Perhaps beauty doesn't necessarily unfold in important scientific research but it can still unveil important artistic inspiration and projects.

- **16683 | Gas-phase thermodynamic stability of 2-benzoxazolinones**

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Thermochemical data are essential for understanding the properties of molecules, namely the energy of chemical bonds, the structural characteristics and the inherent reactivity, whose knowledge is important in different areas such as industrial chemistry, biochemistry, medical sciences and environmental chemistry [1].

This work reports the thermodynamic properties of 3-methyl-2-benzoxazolinone and the correlations between this data and the corresponding structural characteristics, contributing to the study of the reactivity of this kind of compounds.

Static bomb combustion calorimetry and Calvet microcalorimetry were used to determine, respectively, the standard molar enthalpy of formation of 3-methyl-2-benzoxazolinone, in the condensed phase, at $T = 298.15$ K, and the corresponding standard molar enthalpy of sublimation, at $T = 298.15$ K. The results obtained were used to calculate the value of the gas-phase standard molar enthalpy of formation of this compound. In addition, the gas-phase thermodynamic stability of 2-benzoxazolinone and 3-methyl-2-benzoxazolinone was also evaluated using the gas-phase standard molar Gibbs energy of formation for the two molecules. Finally, the relation between the energy and structural characteristics of 3-methyl-2-benzoxazolinone is presented.

Acknowledgments

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- **16684 | Development of a biosensor for detection of cancer biomarkers**

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Although Europe holds 9% of the world population, it has a great percentage of cases of cancer, 25% as estimated for 2018. This corresponds to an estimate of 3.9 million new cases of cancer and 1.9 million deaths in Europe in 2018, making it the most mortal disease in the continent [1]. Thus, there is currently an interest in developing new methodologies for the fast and sensitive screening of cancer biomarkers in point of care.

The main goal of this work is to develop a new electrochemical biosensor capable of detecting cancer biomarkers by combining the surface modification of a gold screen-imprinted electrode (AuSPE) and molecular imprinting techniques.

The molecular imprinted polymer (MIP) was prepared by eletrooxidative polymerization of an aminophenol (APh) on an AuSPE previously modified by a self-assembled monolayer (SAM). The SAM allowed immobilizing protein biomarkers at the electrode surface before electropolymerization [2].

The procedure for preparation of the MIP film was optimized to maximize the specific binding properties between the surface and the target protein, including polymer thickness, protein extraction from the polymer matrix, etc [2, 3]. The MIP sensor performance was evaluated by incubation with increasing concentrations of protein, which resulted in a decrease of the probe redox current [2], meaning that the sensor developed allows for a re-binding of the protein to the MIP.

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- 16685 | Genomic drivers underlying distinctiveness of the Angolan giant sable

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The Angolan giant sable (*Hippotragus niger variani*, Thomas 1916) is considered as one of the most majestic African antelopes because of its "gigantic" features that differentiate it from the remaining sable populations, like the larger skull, the bigger neck, the larger body, and the massive horns. The horns are the "trademark" of the giant sable, being partially responsible for its drastic population decline in the last century, due to poaching and warfare. This subspecies lives isolated from its closest relative, the West Tanzania sable population, for ~119 thousand years, and from its further conspecific relative, the Eastern sable (*H. n. roosevelti*, Heller 1910), for ~350 thousand years. None of the conspecifics has the luxuriant phenotype of the Angolan giant sable.

The giant sable belongs to the Bovidae family that, among other features, is characterized by the horns. The genomic architecture underlying the evolution of these non-deciduous bony structures, specifically their growth and development, is still poorly studied, despite the fact of being the subject of high economic investment for artificial selection of both hornless and larger horn breeds.

In this study, we sequenced Angolan giant sable whole genomes (N=14) as well as whole genomes of its closest and its further conspecifics (N=17 and N=12, respectively) at an average 9X coverage to be able to search for signatures of selection and gene classes over-represented that could be linked to the features of the giant sable. We further expect to contribute to the understanding of the structural and functional changes that are on the basis of such patterns. With these analyses, we intend to understand the processes underlying the exceptional features of the giant sable, and ultimately to bring new knowledge about the genetic basis of these features.

- **16687 | CONSTRAINTS ON CHROMATICISM AND VISUAL INTERFERENCE IN THE INTERPRETATION OF THE INFORMATION AND CONTENT OF PORTO'S PUBLIC ART MAP**

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The Porto's Public Art Map suggests a strong visual impact on the human eye. The presence of strong and contrasting colors, make sinuous the activity of experiencing the map and the routes that are presented in it.

The evidence of large printed areas with intense chromatic games creates a contrast of proportion that, consequently, also diminishes the importance of texts and images referring to the works of art marked on the map.

Regarding the problem of communication between the shape of the color and the informative content, I tried to synthesize and equate the subject in order to justify It, based on chromatic theories that reflect on the application of color in media that communicate essential information to the human being, in this case, information necessary for the good conduct of a map. I based myself on the contribution of psychologists, philosophers and researchers who approach the area of color and graphics as a communicative and interpretive medium, among them Wilhelm von Bezold and Edward Tufte.

Starting with small notes, the course of this paper also focuses on the major aspects related to the issue of colour in all interpretative steps of the map, from the initial impact to the reading of the synopses referring to the operation of the routes. Following different perspectives and different data, my reading suggests a path that encompasses the map as a whole that suggests restlessness in its many different parts. Therefore, this essay denotes the process of materialisation and organisation of the map, focusing on the visual interference that a possible user will have of it and seeks to respond and highlight a good visual acuity that, when combined with the sharing of information and knowledge, it is very important and significant.

KEYWORDS: Porto's Public Art Map; Color; Acuity/Visual interference; Chromaticism; Communication/Information;

- 16688 | Occupational stress associated with exposure to trauma in professional firefighters

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Exposure to traumatic events is frequent in emergency services (Berger, Coutinho, Figueira, Marques-Portella, Luz, Neylen, Marmar, & Mendlowicz, 2012). Emergency care professionals like firefighters deal with death, the risk of death or threats to another person's physical integrity on a daily basis (Berger et al., 2012). Experiencing traumatic situations can have negative consequences and affect the well-being and health of this population, as well as the quality of the emergency serviced provided.

This study aims to explore occupational stress associated with exposure to trauma in professional firefighters. Specifically, we intend to answer the following research questions: 1) What situations do firefighters experience as traumatic? 2) What is the emotional experience associated with traumatic events? 3) What coping strategies do firefighters use to manage traumatic situations? 4) What are the consequences of a traumatic situation's exposure in the professional practice of a firefighter?

Data were collected through logbooks and interviews utilizing the Critical Incident Technique. Afterward, the information collected was submitted to a thematic content analysis using NVivo 12 software.

Results show that exposure to trauma in firefighters is a subjective and diverse experience with an accentuated negative dimension. In fact, negative emotions and negative consequences resulting from traumatic events have an impact more significant. Thus, when exposed to traumatic events, firefighters experience distress. To manage these situations and those associated negative emotions, they often resort to emotion-focused coping strategies.

This study allowed for a better understanding of the traumatic events and their impact in firefighters, contributing to a greater awareness of the importance of psychological intervention in these professionals, through the development of strategies and actions in secondary prevention to improve these professional's quality of life.

- 16693 | The epitranscriptome in gastric cancer: the role of m6A mRNA modifications

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Epigenetic modifications play a critical role in gene expression and its dysregulation is a consistent feature in multiple cancers. In recent years, RNA modifications, referred to as the “epitranscriptome”, represent an additional layer of gene regulation, being fundamental modulators of many biological and disease processes.

N6-methyladenosine (m6A) is the most prevalent internal RNA modification present within almost all types of eukaryotic RNAs. Transcriptome-wide mapping results from previous studies suggest that transcripts from more than 7 000 human genes can be m6A-modified and these modifications are important for gene regulation, cell renewal and cell differentiation. For this, m6A RNA modifications must be recognized by m6A reader proteins that contain the YT521-B homology (YTH) domain which serves as a module for recognizing m6A in a methylation-dependent manner. One of these proteins is the YTH domain-containing family protein 3 (YTHDF3). The role of YTHDF3 in RNA metabolism in cancer is still unclear but data obtained by our group suggests clinical significance of this protein as a biomarker of therapy response in gastric cancer. The results indicate that cancer patients with high expression of YTHDF3 have a significantly superior benefit from adjuvant chemotherapy, suggesting that m6A RNA modifications might play a role in gastric cancer progression.

The aim of this project is to modulate the expression of YTHDF3 in gastric cancer cell lines and characterize the biological behaviour of the cells regarding proliferation, apoptosis, invasion, therapy response, migration and metastization in vivo. In order to do this, Δ YTHDF3 mutant AGS and SNU-638 cell lines are being produced using Crispr and siRNAs after which their biological behaviour will be characterized.

We believe that our work will bring new insights into the role of epitranscriptomics in gastric cancer.

- **16703 | Loneliness and its associated variables in older adults in Europe**

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European population is ageing at a fast rate. With age, decreased motor capacity lead older people to become sedentary which increases social isolation and consequently loneliness. Loneliness carries several risks, such as anxiety, depression and mental illness, decreasing quality of life, which is a burden for healthcare and social systems. Therefore, this work aims to evaluate the prevalence of loneliness among the European population over 55 years old, and study its association with some variables.

Data from wave 6 of the Survey of Health, Ageing, and Retirement in Europe (SHARE) was used, which is an international database with data health, social and economic status, and social and family networks, of 17 European countries plus Israel.

From all the 68231 participants of wave 6 of SHARE, we included only those aged 55 or more and who answered to all the questions related to gender, BMI, education, computer skills, life and network satisfaction, meaning of life, self-perceived health, and all 3 questions of the R-UCLA scale, used to assess loneliness, yielding a total of 52552 participants included. Of those, the average age was 68.8 ± 8.9 years and 55.5% were women. Overall, 24.5% of participants were lonely, with Denmark, Austria and Switzerland having the lower prevalence (8.5%, 12.2% and 13.0%, respectively), and Italy, Israel and Greece with the higher (34.4%, 48.6% and 48.9%, respectively). Loneliness was found to increase with age (20.8% of the population aged 55 to 64 years were considered to be lonely, while this number almost doubled for those aged 85+, 38.2%), and to be more prevalent in women (27.6% vs 20.5% in men). Also, loneliness was associated with all the variables included.

With these results, it is clear the level of loneliness and its association with diverse variables. Therefore, multidimensional interventions should be taken to minimize it, enhancing people quality of life, ageing, and well-being.

- **16704 | Degradability Evaluation of an Ecofriendly Wet-White Leather**

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Leather industry is a very old manufacturing sector that plays a prominent role in the world's economy. Today almost 90% of the leather is produced globally by chrome tanning method using basic chromium sulfate as tanning agent. The concerns raised on the negative impact of chromium on the environment has forced tanners to pay attention to the processes that would reduce the problems related to pollution. The development of chromium-free leather (wet-white tanned leather) is thus constantly expanding.

Considering that the average lifecycle of tanned leather is between 25 and 40 years, the accumulation of this waste in landfills and the management of its disposal implies a high economic as well as environmental cost. Alternative tanning agents should provide leather with similar properties to those of conventional chrome-tanned leather and with a lifecycle closer to the useful life of the footwear, which would result in less time for its degradation or composting. Thus, the assessment of the degradability of a wet-white tanned leather becomes essential.

In this project a methodology based on the Sturm test was implemented and optimized in order to evaluate the degradability of a wet-white tanned leather. The measurement of CO₂ evolved during 30 days, mass loss (9.4 % w/w) and visual changes observed in leather samples before and after Sturm Test indicate that the wet-white tanned leather was biodegradable under the studied conditions. These results were confirmed by DSC analysis; the peak attributed to pyrolytic degradation of collagen has disappeared. At laboratory scale under the degradation conditions tested, wet-white tanned leather showed a better biodegradability than conventional chrome tanned leather.

Acknowledgements

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- **16705 | Optimization of carbon/ nitrogen ratio in Biofloc systems**

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The increase in inland aquaculture production is limited by water resource, land and feedstuffs availability. To overcome these problems, it is essential to adopt strategies that allow water and nutrients to be recycled. Biofloc technology (BFT) is an aquaculture production strategy that focuses on a more efficient use of nutrient inputs with limited or zero water exchange. The main principle of BFT is to recycle nutrients by stimulating the proliferation of heterotrophic bacteria, which convert ammonia into microbial biomass that can be used as feed. The heterotrophic bacteria proliferation is achieved by maintaining a high carbon: nitrogen (C: N) ratio in the water. This project aimed to determine the C:N ratio that is most effective in the establishment of a closed BFT system. For that six C:N ratios (10:1, 12:1, 14:1, 16:1, 18:1 e 20:1) were tested in duplicates in 60 L tanks with controlled temperature (22°C) and photoperiod (12/12h light/dark). The same amount of sludge from an experimental aquaculture system was added to each tank, as a bacterial inoculum, and ammonium sulfate and native starch were used as N and C sources, respectively. Each tank received 4.5g of ammonium sulfate, corresponding to the amount of total ammonia nitrogen (TAN), of 1 gTAN /kg fish/day, that was expected to be produced in the experimental system where BFT is to be applied. Ammonium sulfate continued to be added to each tank once the concentration was reduced to half. The amount of native starch added to each tank differed according to the C:N ratio of each treatment. To evaluate the BFT growth the following parameters were measured: ammonia and nitrite concentration, volume of settleable solids, turbidity, pH and biochemical oxygen demand. The experiment will last until the BFT is able to degrade the ammonia present in 4.5g of ammonium sulfate in a 24h period.

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- 16707 | A Threatened Digital Herbarium – representativeness of Red Listed Vascular Plants’ specimens from Continental Portugal at PO Herbarium of the Museum of Natural History and Science (U.Porto)

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Herbarium uses diversified from a dominant research topics uniting its core contribution to taxonomic knowledge (e.g., taxonomic notes, botanical history, local observations) to a wider array of topics only recently emerging (e.g., biodiversity informatics, global change biology, DNA analyses). Following-up with recent uses of Herbarium data, this project aims to elaborate a readily accessible digital Herbarium of Portuguese Red Listed taxa housed at Porto University Herbarium. Considering these specimens as examples of the threatened species listed on the recently released Red List of Vascular Plants from Continental Portugal, we aim to review and contribute to the conservation and knowledge of these taxa.

In order to do so, we matched Portuguese Red List’s taxa and PO’s specimens to elaborate a database, which will provide biogeographic and temporal information on more than 800 taxa, and a specimen digitization base, which will provide essentially visual morphological information of the each taxon. We also intend to research ecological data relevant to monitoring plans of threatened species of the cited Red List.

The ultimate goal is to share this information with a broad and interesting community by uploading our results into internet platforms such as Flora-on and GBIF, hoping that it will be helpful for end-users such as academics, technicians and managers interested in studying plant biodiversity and taking action for its conservation. It is our comprehensive aim, to show the growing relevance of herbaria data (including of specimens with more than a hundred of years old) to science, education and current society.

- 16709 | The role of corticostriatal circuitry in pain responses and pain-related working memory deficits

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Pain-induced morphological and functional alterations in the corticostriatal circuitry can result in working memory (WM) deficits. However, it remains unclear how these changes influence cognitive information processing and if they can be reverted by selective neuromodulation of local circuits. Thus, this work aimed to understand the impact of inflammatory pain in corticostriatal networks to further restore WM behavioral performance and reduce pain responses. To address this issue, we optogenetically stimulated the prelimbic medial prefrontal cortex (PL-mPFC) excitatory neurons that share projections to the core region of the Nucleus Accumbens (NAcc) during the delay-period of a delayed non-match to sample task (DNMS) WM task. To selectively activate those neurons during the cognitive demand, we injected an AAV5-hSyn-hChR2(H134)-eYFP virus in the PL-mPFC and implanted an optical fiber cannula in the NAcc to deliver light photo-stimulation. Behavioral performance was assessed using a rodent model of inflammatory pain - complete Freund's adjuvant (CFA). Our results show that CFA-treated rats decreased, but not significantly their WM performance. This effect was observed either during pre-probe or probe DNMS sessions. Moreover, CFA-treated rats showed a limited progression in the reward obtention when compared to control rats during probe sessions. In addition, we found an important antinociceptive effect in CFA-treated rats. Together, these results suggested that this circuit may have an important role not only for the cognitive demand but also for pain information processing.

- **16715 | Development and characterization of buccal films containing fluconazole**

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The increased efficiency of oromucosal preparations has become evident with the advancement of pharmaceutical technology and the development of innovative therapeutic systems. Thus, the study of safer and more effective therapeutic systems for oromucosal administration is a promising challenge. The aim of this study was the development and characterization of Hydroxypropylmethylcellulose (HPMC K100M) mucoadhesive buccal films containing fluconazole, an antimycotic drug frequently used in the treatment of oral candidiasis.

Films composed of HPMC K100M were prepared by dispersing this polymer in purified water. Then, glycerin (used as plasticizer) and fluconazole were added. Films without fluconazole were also prepared. In order to characterize the buccal films, the following parameters were evaluated: mass uniformity; thickness; humidity; saliva resistance; extensibility; and in vitro drug release were evaluated.

The results of films characterization showed that the incorporation of fluconazole did not cause a significant change in the films weight and thickness. When submerged in artificial saliva, films did not disaggregate and showed gelation after 1 hour. Regarding extensibility, buccal films with and without fluconazole did not show significant differences ($p=0.06$). However, there were significant differences ($p=0.001$) between both films regarding tension. In this case, films without drug were more resistant to disruption, requiring more force to break comparing with drug loading films. In vitro fluconazole release from HPMC K100M buccal films was less than 50% up to 180 minutes, which shows prolonged drug release.

The results of this study demonstrated that HPMC K100M films have good characteristics and are suitable for buccal administration of fluconazole. However, further studies should be carried out to optimize the developed formulation.

Key words: Fluconazole; buccal administration; mucoadhesive films

- 16718 | Evaluating the seasonal variation of the biomass of species of seaweed with commercial value in two Northern beaches of Portugal- Aguçadoura and Viana do Castelo

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The use of seaweed for commercial purposes is varied and has been rising in the last years, increasing the market demand of certain species. In order to prevent the risk of overexploitation of natural seaweed populations, it is essential to establish monitoring campaigns to evaluate the temporal variation of their biomass. In this study, data from previous studies will be combined with on-going monitoring of five seaweed species (*Osmundea pinnatifida*, *Codium* spp.; *Mastocarpus stellatus*; *Chondrus crispus*; *Chondracanthus acicularis*) in two rocky shores located in Northern Portugal- Aguçadoura and Viana de Castelo. These data will allow increasing knowledge on the temporal (seasonal and interannual) dynamics of these seaweed populations. Sampling procedures consist of percentage cover measurements using 0,25 m² quadrats, placed randomly along two transects in each rocky shore, and physical-chemical parameters measurements using a multiparametric probe. Percentage cover data will be converted to dry weight using regression equations previously established. Previous studies so far indicate that, generally, there is a decrease in abundance during the Autumn/Winter seasons and a slight increase during Spring/Summer, as expected. This dataset will be compared to data gathered during this study in order to assess interannual variability in abundance of the above mentioned species. Knowledge acquired in this study is relevant for the application of future conservation measures or the establishment of regulations for sustainable harvesting plans.

- 16722 | WILD OPUNTIA FICUS-INDICA: nutritional comparison and potential whole fruit usage

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Opuntia ficus indica is a fruit bearing cacti species that has been gaining territory in the semi-arid regions of the north of Portugal as an invasive species, especially in Trás-os-montes and Alto Douro areas. Despite this, the qualification of *Opuntia* as an invasive species is quite questionable. Its fruit is edible, as well as the seeds and cladodes.

Our team has initiated research of the wild variety found in the north of Portugal in hope to bring to the light the fruit's wide nutritional range and potential food products, taking into account its different parts. Here we explore the nutritional composition of the seed (including its oil), the pulp (for juicing and jam) as well as the peel, with a special regard to this last one, as it's the most commonly discarded part. The different fruit parts showed interesting nutritional profiles, determined by AOAC methods [1]. Both pulp and peel show a high amount of moisture, as common with fruits, of 88.4% and 84.6% respectively, while the seed present a lower value (49.5%). The seeds show the highest protein and lipid content comparing with the rest of the fruit parts, (3.5% wet weight and 6.1% dry weight respectively); the peel shows the highest ash content of 1.5% wet weight, which may be indicative of a higher mineral content.

Being this an odd fruit to most Portuguese consumers, we encourage the processing of its byproducts (seeds, pulp and peel) into more market appealing products that at the same time benefit the consumer in nutritional ways and the planet on ecological ways.

[1] AOAC (2012). Official methods of analysis of Association of Official Analytical Chemistry, 19a ed. AOAC International, Maryland, EUA.

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- 16725 | Antibacterial activity of lemon verbena (*Aloysia citrodora*) and saffron (*Crocus sativus*) aqueous and ethanolic extracts against fish pathogen bacteria

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In the last years, many studies have reported several bio-medical properties, such as antioxidant and antibacterial activities of lemon verbena plant and the saffron floral bio-residues. However, there are very few studies about the bactericidal capacity of the extracts of these plants against fish pathogen bacteria. Therefore, the aim of the current study was to evaluate the bacteriostatic and bactericidal activity (Agar disk-diffusion and MTT assays) of the aqueous (five) and ethanolic (two) extracts of both plants (*C. sativus* and *A. citrodora*) on *Photobacterium damsela*, *Vibrio parahaemolyticus*, *V. anguillarum*, *V. harveyi*, *Aeromonas hydrophila*, *Yersinia ruckeri* and *Edwardsiella tarda*. For this, lemon verbena leaves and saffron floral bio-residues were boiled in water (W1, decoction) for 10 min (100 °C) while for preparing infusion boiling water was added to the herb material and left undisturbed for 10 min (W2), 1 h (W3) and 4 h (W4). The W5 extract was prepared after 1 h of infusion with water:HCl (100:1, v/v) whilst ethanol (E1) and ethanol:HCl (E2, 100:1, v/v) extracts were prepared during 1 h. Our results revealed that the bactericidal activity, assayed by MTT, exhibited a higher activity of all experimental extracts against the pathogen bacteria tested. Similarly, the bacteriostatic activity showed a reduction of the growth of the fish pathogen bacteria used when incubated with all herbal extracts. Interestingly, the agar disk-diffusion method not revealed activity of any aqueous and ethanolic extracts maybe influenced by the higher bacteria-herbal compounds ratio. To conclude, the aqueous and ethanolic extracts of these plants revealed interesting antibacterial properties against these fish pathogens. However, further research is needed to identify the active compounds responsible for the antibacterial activity of these herbal extracts.

- **16727 | Monitoring of lung adenocarcinoma patients through the study of large chromosomal rearrangements in liquid biopsy**

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Lung cancer is the leading cause of cancer-related death worldwide and has the highest incidence rate in men. Non-small cell lung cancer is the most common subtype with its own set of genomic and epigenomic alterations. It is usually diagnosed at a late stage due to the low sensitivity of routine and invasive medical examinations. Even when treatable, the likelihood of relapse is still significant. It is well established that the overall quantification of cell-free DNA (cfDNA) can be used as a prognostic factor. This is directly proportional to the stage of disease considering that patients with more advanced tumors show higher levels of cfDNA in circulation. Overestimation of tumor burden is suggested by measuring cfDNA levels alone. Taking all this into consideration, the aim of the project is to develop a strategy to monitor clinical evolution using liquid biopsy as a non-invasive tool, in this case using "Shallow Whole Genome Sequencing". This tool is characterized by its low cost and allows the acquisition of data on the rearrangements from samples, regardless of the quality and quantity of DNA.

Given the strong association of those chromosomal rearrangements' profiles with prognosis, analysis at diagnosis is mandatory. So, in this study we are developing and optimization an approach using first, lung adenocarcinoma cell lines, whose genomic profile is known. Tissue samples and peripheral blood from patients with a different genomic expression profile are analysis with this tool and together with bioinformatic tools (DNASTAR, Ion Reporter, Torrent suite) to determine mutation levels as well as chromosomal rearrangements in the genome.

Implementation of this tool will provide a profile with a variety of known and unknown changes for early diagnosis and monitoring of patients with a single blood sample.

- **16753 | Geological route in the Historical Center of Oporto as a tool in Science Education**

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The importance of the city of Porto is not exclusively a historical merit, it's also a fundamental part of its contemporary identity. Due to its historical relevance and the degree of urban, structural and cultural development, the historic center of Oporto received, by UNESCO, the merit of Cultural Heritage of Humanity. Its historical, geographical, architectural and cultural particularities are directly linked to the geology of the region and the application of stones in the construction of the city throughout history. Therefore, the elaboration of a geological route in the historical center of Oporto is, in essence, the practical materialization of the answer to the question of the way in which regional geological characteristics have conditioned the old urban implications, its historical evolution and the current structural challenges. The proposal is grounded as a possible pedagogical tool to be used in study visits of Urban Geology, in a way that is possible to understand, *in situ*, the way in which regional geological characteristics contributed to urban evolution. An example of that is the extensive use of Oporto Granite in the construction of historic buildings, directed linked to the strategic use of its topographic features, as occurred during the establishment of the primitive urban core of Oporto, in the Bronze Age, on the Pena Ventosa Hill, due to its high relief when compared to the surroundings and proximity to the bank of the Douro River (Mendes. 2013). Also and important factor in the region are the current conditions of high geological hazards, observed in some of the slopes, in which hazards containment measures were established through the use of metal nets and the use of concrete. Therefore, as object of study are considered the historical fraction of the city of Oporto and the present relation between its topographic, hydrographic, lithological, morphological, architectural and the urbanistic aspects conditioned by these elements.

- **16754 | Influence of the cell wall in the post-Golgi traffic in protoplasts**

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The endomembrane system is a group of membranes and organelles in eukaryotic cells that work together to modify, package, and transport lipids and proteins. These proteins are directed to different compartments according to the signal they have and the role they play within the cell. This system can also be defined as the set of membranes that form a single functional and developmental unit, either being connected directly, or exchanging material through vesicle transport. These membranes divide the cell into functional and structural compartments. It includes: the endoplasmic reticulum, Golgi apparatus, vacuole, vesicles, cellular wall, plasma cell membrane, among others. The aim of this project is to study the interaction of proteins with different cellular compartments (Golgi Apparatus, Endoplasmic Reticulum, Vacuole and Cell Wall) and the way they move within the cell using *Arabidopsis thaliana* and *Nicotiana tabacum* as work models. These plants were selected because they are easily manipulated and their physiology and molecular and cellular regulation is well known. As reporters for this study we will use cardosin PSI-A and PSI-B, along with C-terminal VSDs which possess the ability to redirect proteins to the vacuole. The techniques used will include protoplasts in secretion assays to confirm that the absence of cell wall influences the way proteins are transported to the vacuole, as previous results showed that some vacuolar proteins are secreted to the external medium when expressed in protoplasts. In order to establish the methodology, viability assays will be conducted, and cell wall regeneration methods will be tested. The trafficking pathways of our reporters will be analyzed to evaluate if the cell wall does influence their sorting. In conclusion, we hope to prove and define the role of the cell wall in redirecting proteins to the vacuole.

- **16756 | Prokaryotic Dynamics in North Pacific Subtropical Front**

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Ocean fronts are fundamental to marine ecosystems by contributing to the primary production and biodiversity of the oceans. Besides having important environmental roles, OF have several applications and are important for society. Applications can vary from marine transportation to the fish industry. Microbial communities are crucial for different ecosystem functions occurring in ocean fronts. However, few studies have addressed microplankton communities, the basis of the food web, in these systems. Also, the dynamics of the biogeochemical factors are not fully understood. This ongoing research aims to investigate the patterns of the horizontal and vertical distribution of prokaryotic communities across the North Pacific Subtropical Front (NPSF), an area with economic relevance and a known site for fishing. The sampling was performed on board the Falkor research vessel from Schmidt Ocean Institute on behalf of the project "Exploring Fronts with Multiple Robots". Prokaryotic community diversity was studied by following a metabarcoding approach of the 16S rRNA to characterize patterns of distribution and relative abundance across the NPSF, using next-generation sequencing (NGS) in MiSeq Illumina platform and bioinformatics tools. This research is crucial to bridge the gap between the dynamics of microplankton communities and the controlling biogeochemical factors in ocean fronts, using the important NPSF as a case study, which is understudied due to its relatively small magnitudes of temperature and salinity gradients. By being based on NGS, this research will allow sequencing the microplankton samples with higher precision and with a bigger resolution. In the future, understand how the eukaryotic distribution is affected by the same type of biogeochemical factors in the same local is also necessary.

- **16758 | Nanostructured lipid carriers (NLCs) containing LEM2 for topical treatment of skin cancer**

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Skin cancer affects millions of people around the world, representing a major public health concern. Melanoma is the most aggressive skin cancer type, being associated with a high lethality. Thus, it is important to improve the efficacy of skin cancer treatment. Topical treatment of skin diseases is a good strategy since avoids systemic side effects that usually are associated with oral and parenteral drugs administration. LEM2 is a synthetic xanthone with proved antitumor effect in melanoma. However, it presents poor aqueous solubility, which is often related with poor bioavailability, limiting its therapeutic use. The use of lipid nanoparticles, such as nanostructured lipid carriers (NLCs), to encapsulate drugs can improve their bioavailability and seems to be very interesting for topical delivery of drugs due to their adhesion and occlusive properties.

In this work, unloaded and LEM2 loaded NLCs were prepared by ultrasonication using the following excipients: Precirol® ATO 5; oleic acid; Tween® 80 and purified water. The developed nanoparticles were characterized in terms of particle size, polydispersity index, zeta potential (ZP), and encapsulation efficiency (EE). Loaded NLCs had a mean particle size suitable for topical application (around 220 nm) and an EE around 70%. In vitro studies were performed with melanoma A375 cell line and loaded NLCs seemed to be more cytotoxic against melanoma cells than unloaded NLCs, possibly due to LEM2 antitumor activity, which means that NLCs could be used as a carrier to this drug, improving its bioavailability problems.

- 16759 | Influence of irrigation on the yield and quality of cv. Touriga Nacional in the Douro Region

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The problem of climate change as well as the conditions of high water stress must be taken into account in wine production in Portugal, particularly in the Douro Demarcated Region, where there is a high water scarcity along the growing season of vines.

This study aimed to analyse the effect of different Regulated Deficit Irrigation volumes, R0, R25, R50 and R75, corresponding of 0 (Control), 25, 50 and 75% of evapotranspiration) on yield and quality of Touriga Nacional variety. Different strategies of irrigation were applied: biweekly irrigation (I15) and weekly irrigation (I8), at Quinta da Cabreira, Douro Superior sub-region, property of Quinta do Crasto S.A.

In terms of results, in budburst rate treatment I15 presented significant differences between the modality R50 (104,95%) and modalities R25 (98,64%) and R75 (99,82%); regarding total leaf area treatment, in I8 significant differences were observed between the modality R75, with a value of 4,08 m² and the modalities R0 (1,79 m²) and R25 (2,54 m²) on 5th september. Concerning pre-dawn leaf water potential, in I8 treatment, significant differences were observed on 5th September, between R75 (-0,42 MPa) and R0 and R25, that registered values of -0,75 MPa and -0,76 MPa respectively, and on 8th September, significant differences were registered between R0 (-0,75 MPa) with R25 (-0,55 MPa), R50 (-0,55 MPa) and R75 (-0,51 MPa). In terms of quality of musts, differences were registered in treatment I8 between R50 with probable alcohol value of 15,27% and R75, with a value registered of 13,97%, at harvest. Also, differences were observed in yield, between R75, with clusters weight per plant of 1,81 kg and R0, with a value of 1,46 kg at harvest in treatment I15.

As final conclusion, it was observed that watering with R50 and R75 of ET_c can present better results. But inconclusive results were registered in I15 or I8 treatment, since these treatments had different advantages in terms of yield and quality.

- **16760 | The Life Course of a Drug User**

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The interest in life course and their relationship with drug use has shaped the main point of inspiration on this work, seeking to observe the phenomenon in question through the developmental perspectives of criminology. In this perspective, it was considered essential to know the reality out of the experience of the persons who lived that, from the narrative of what is their life story. When looking at drug use as a deviation from normativity, it is necessary to look at the contours of this antisocial behavior. In this specific case, a retrospective view of the subjects' experience in relation to their life and consumption path was essential.

For this, we used life stories as the primary method, where individuals could talk about social context, health, work and school background, peers, affective relationships, family, relevant life events and drug use - beginning, progression, desistance - and contact with the justice system.

As an instrument to analyse the interviews, a "biogram" was developed where, graphically, it was possible to see and analyze the reported information, allowing a look at the life trajectories of these consumers - what happens before, after and/or co-occurs with certain events.

From this analysis, it was possible to understand that different risk factors have different impacts on the trajectory, as it happens with life events.

The onset, continuity, progression, desistance and relapse are influenced by several factors in all the stages of an individual's life.

- 16764 | The influence of ocean pollution: Study of the amount of microplastics in *Sardina pilchardus*

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The ocean's pollution has become a world concern that needs immediate attention. Particularly the microplastics, provide a negative impact on marine life, affecting all food chain and consequently the human health. The presence of microplastics and other natural fibres were evaluated in a species named *Sardina pilchardus*, a typical Portuguese fish, the sardine.

This project reflected the internship at the Center for Environmental Monitoring and Interpretation (CMIA) of Vila do Conde is a municipal infrastructure with scientific coordination of the Interdisciplinary Center of Marine and Environmental Research (CIIMAR)., within the curricular unit Project/Internship, of the senior year of the course Medical Biotechnology, at ESS (School of Health of the Polytechnic Institute of Porto).

On this project there were made analysis in two distinct sample. The first one was obtained in a supermarket of Matosinhos (from the northeast Atlantic, in a Portuguese area), and the second was traditional fish market of Vila do Conde (from the northeast, in the Portuguese waters). This investigation work aims to study the presence of microplastics in the gastrointestinal tract of sardines, by analysing the digestive gland of these organisms. This has the objective of raising awareness of the problem of marine microplastic pollution.

The methodology was divided in three principals' parts: preparing the samples (weigh, measure height and length) tissue collection and treatment (animal dissection, gastric contents treatment and microplastic extraction) and, finally, the accounting of microplastics.

The results expressed the presence of microplastics in all samples, seeing that the fish market samples presented a smaller number. These results are of major concern as high socioeconomic impact on the Portuguese diet.

Microplastics are harmful to both human health and marine animals. There are not a lot of technology to quantify their presence in the environment.

- **16769 | The house from the roof: attic transformation in Lugo**

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Over the years, has been observed the tendency of progressive increase in population, which created the need for new construction. Due to the modern movement of the XX's century and the new forms of construction, the occupation of the rooftop spaces develops with great intensity. Nowadays, it is important to think of empty spaces in buildings located in densely populated cities. This work happens with the will of study the alternatives to the residencial areas common to contemporary. It is therefore proposed to investigate the use of the roof space, giving it a new use.

The object of study - fields of roof of the residential building, which is located in the west of Lugo, the oldest city of Galicia. It is located in the neighborhood, called La Milagrosa, that was built over the grounds of the roman aqueduct and roman baths and compared to the old city, appeared only in the XX's. This neighborhood is the most populous and the most extensive of the city and can be even larger in the future. This work may also serve as an answer to urban densification, offering an alternative to the need to construct in spaces already built, promoting an increase of space for existing dwellings or the creation of new residencial areas.

From the theoretical basis: the historical framework and reference analysis, there will be a practical component consisting of several strategies and possibilities of intervention that will allow us to analyze the advantages and constraints of each proposal in sense of selecting the most appropriate options to intervene in this kind of spaces.

This research will build an atlas of interventions, strategies and mechanisms to reinhabit the urban roof, as a tool for creating better living conditions.

- 16774 | Evaluation of the antitumor potential of novel methyl 3-(het)arylthieno[3,2-*b*]pyridine-2-carboxylates

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The discovery of novel compounds with applications in the field of biomedicine is crucial for countless diseases, especially for cancer treatment. Herein, by C-C Pd-catalyzed Suzuki-Miyaura cross-coupling of methyl 3-bromothieno[3,2-*b*]pyridine-2-carboxylate, also prepared, with commercial (het)aryl pinacol boranes, trifluoro potassium boronate salts or boronic acids, novel methyl 3-(het)arylthieno[3,2-*b*]pyridine-2-carboxylates 1a-1h were synthesized (Figure 1) and fully characterized. Their antitumoral potential was evaluated in human tumor cell lines from pancreatic cancer (PANC1 and BxPC3), NSCLC (NCI-H460) and TNBC (MDA-MB-231 and MDA-MB-468), by Sulforhodamine B assay. The cytotoxic effect of the best compounds on a non-tumorigenic cell line MCF12-A was also studied. Cell cycle analysis was performed by flow cytometry following PI staining. The expression of some proteins involved in the cell cycle or DNA damage was studied by Western Blot. One compound was also tested in the *in ovo* CAM (Chick Chorioallantoic Membrane) assay. Results showed that 1e, 1f and 1h caused growth inhibition in the breast cancer cell lines (with GI50 < 13 μM), without presenting much toxicity against the non-tumorigenic cell line MCF12-A (at their respective GI50 values). Although further assays are necessary, the flow cytometry analysis showed that 1h altered the cell cycle profile of MDA-MB-468 cells by increasing the G2/M phase with concomitant decrease in the G0/G1 phase; in addition, Western Blot analysis showed an increase in the expression of p21 of cells were treated with 2x GI50 concentration of 1h. On the other hand, 1e induced DNA damage (suggested by an increased expression of γ-H2A.X by Western Blot) and decreased the size of xenografted MDA-MB-231 tumor cells, evaluated by the *in ovo* CAM assay, at its GI50 concentration. Compound 1f did not alter the cell cycle profile nor induced apoptosis; 1e and 1h are promising inhibitors of tumor cell growth.

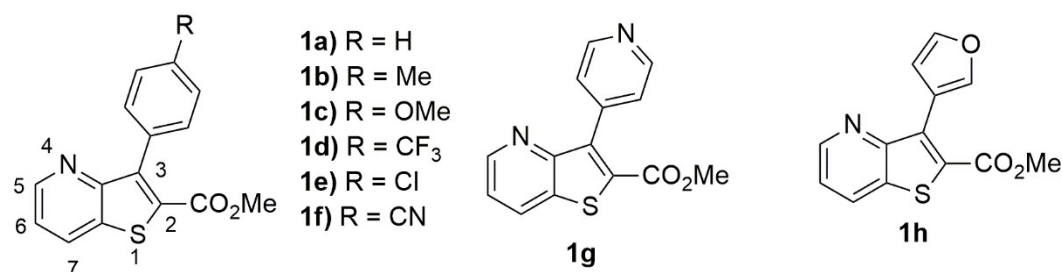


Figure 1- Structures of the compounds prepared and biologically evaluated.

- **16775 | Conceptions about Physical Education**

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This work is part of the course Curriculum Development in Physical Education, the course 2nd Cycle in Teaching Physical Education in Primary and Secondary Education, Faculty of Sport of the University of Porto and has the theme "Conceptions about Physical Education" In this specific case of Physical Education teachers in different contexts. Physical Education has a vast content formed by the various body manifestations created by the human being over the years. With this, it is essential that the teacher of P.E can transmit this knowledge to students and for this, it is necessary to understand which conceptions and ideologies that these professionals have as reference for the development of these manifestations in teaching. The focus of this work is to bring the participating teachers' vision closer to the ideological field Biologist and Pedagogist presented by the author Bart. J. Crum. (1993) limiting, influencing and retarding the perspectives and practices of Physical Educators, as well as the ideological vision focused on Sociocultural and Embodied Learning described by the authors Batista and Queirós (2015) that recognizes our body as the main medium for self experiences with the world. The objectives of this study are to compare the conceptions about Physical Education among teachers of different backgrounds and realities, to point out the concurrence that teachers defend or idealize and to bring their understanding closer to the predefined authors. The research is qualitative descriptive because it requires the classification and collection of data and processes and was conducted through a questionnaire via the web. Keywords are: Ideology, conception, biologist, learning, pedagogist, physical education, embodied learning.

- 16776 | The use of a Balance Platform in designing specific and targeted treatment programs to optimize therapy outcomes.

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The postural balance system is complex, requiring the central nervous system to gather and integrate information from the 3 sensory systems: somatosensory, visual and vestibular systems. This integration will result in safe and appropriate postural control thanks to the coordination between the various body segments, leading to the performance of different tasks without losing balance.

Because balance problems can affect various population groups, care for postural balance may benefit the overall quality of life. Also, the variability of individual adaptive reactions is great, resulting in a huge diversity in individual difficulties and their therapeutic approach.

Thus, methods and technologies, such as the force platform, aimed for objective capacity assessment and therapeutic definition, become essential tools in designing a specific and targeted approach which has been recognized as producing better results over more generic methods. By this method is possible to objectively quantify the 3 types of physical balance control impairments: sensory, motor and central adaptative impairments.

To evaluate its usability, in a pilot study a small sample of 22 students volunteered to perform a balance assessment protocol, using a force plate, prior to a session of a 10 minutes basic postural training protocol, consisting in maintain a relaxed standing position, breath calm, elongating the spine while equally distribute the weight on both feet. After a new assessment the scores thus obtained were compared and showed overall small improved scores, more notorious in the previous worst performers.

Of course, being a too small pilot study, its objective was fulfilled by simulating real conditions in clinical or sports environment, showing how quick and practical this method can be, helping in the quick time optimization of balance protocol programs.

- 16777 | Antimicrobial Peptides as a novel way to tackle *Mycobacterium avium*

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Infectious diseases represent one of the greatest global health challenges, with tuberculosis still being up to this day, not only the deadliest infection but also one of the top 10 causes of death according to WHO. Tuberculosis is caused by *Mycobacterium tuberculosis*; however, this species is not the only one from the *Mycobacterium* genus that causes disease. In fact, nontuberculous mycobacteria (NTM) infections have been increasing worldwide over the last three decades, even surpassing the rate of incidence of tuberculosis in some areas of the world. *M. avium* and *M. intracellulare* are two NTMs that are both enclosed under the same complex, the *Mycobacterium avium complex* (MAC), which are considered to be opportunistic pathogens since they infect immunosuppressed individuals and people that have chronic respiratory distress, causing both pulmonary and disseminated infections in adults, and MAC-associated lymphadenitis that is usually diagnosed in children.

With a unique and complex lipid-rich cell wall, mycobacteria have a high intrinsic resistance to antibiotics. Due to this resistance, the existing treatments for these infections are not only highly prone to fail but also long, costly and toxic due to the cocktail of various antibiotics used. Thus, new therapeutics are required. Antimicrobial peptides are a new promising therapeutic approach to these infections not only because of their direct activity by disruption of the microbial cell envelope but also by their immunomodulatory effects. Therefore, the aim of this work is to synthesize and test new peptides against *M. avium*, in order to reduce not only the load of antibiotics that are prescribed to a patient diagnosed with MAC disease but also the probability of therapeutic failure.

- **16780 | Quilombola Education in Brazil as a tool for social inclusion and recognition.**

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Present paper refers to a educational research involving local schools within Afro-Brazilian descendants ancient communities, in Brazil referred to as Quilombolas.

Quilombolas are the remaining communities which have originated, in Brazil, as a result of the African slaves' evasion from the farms where they were forced to live in slavery. In Brazil, slavery has officially ended in 1888, and since then, these communities struggle for survival of their original African and ancient traditions, culture, as well as for land ownership recognition, etc. The Brazilian Constitution of 1988, in its article 68, guarantees and legitimates the ownership of the Quilombolas' occupied lands, but despite the Constitutional recognition of their civil rights, in practice, out of the hundreds of communities within the country, only a small group of 65 Quilombolas have been officially recognized by the Government. In this sense, this research focuses on aggregating value to the schools within the Quilombola communities, as an additional and fundamental tool to reinforce their own cultural aspects and values.

The didactic strategy in this research is based on the principles according to the Brazilian National Curriculum Guidelines for the Quilombola School Education in the Basic Education, which establishes that this particular group of schools and communities demands customized pedagogy and didactic tools, specifically and specially designed and adapted to the particular educational environment and involving, within other aspects, respect to the ethnic-racial and cultural diversity. In this context, Paulo Freire is a reference and guide to our pedagogical and educational approach, in the sense that his theory states that education as a practice must be contextualized specifically within the reality of the community and the people, involving social, cultural, and educational aspects which may be defined and recognised by the subjects themselves, according to their struggle for survival.

- **16782 | WIDESPREAD OF COLISTIN-RESISTANT MCR-POSITIVE ENTEROBACTERIACEAE IN FRESH CHICKEN MEAT, NEW FOOD SAFETY CHALLENGES AND THREATS FOR ONE HEALTH**

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The emergence and spread of multidrug-resistant (MDR) bacteria to last-resort antibiotics like colistin-Col is a global threat to human-animal-food-environment sectors. Due to extensive Col use for veterinary purposes, food-producing animals are considered the main reservoir of mobilized Col resistance (*mcr*) genes. However, the role of poultry-production as a source of *mcr* genes is underestimated in EU. This study investigates the presence and genetic background of *mcr*-carrying bacteria among chicken meat.

Samples (n=53-10 pooled chicken carcasses; n=29-farms; spring/summer-2018) were pre-enriched in BPW+Col (3.5mg/L) and processed by cultural and molecular approaches. DNA from BPW+Col and selected colonies, previously identified by MALDI-TOF MS, were screened for *mcr*-(1-5) genes. Isolates' relatedness was investigated by FT-IR spectroscopy, MLST and phylogenetic groups (PhG) for *E.coli* (Ec) or *wzi* sequencing for *K.pneumoniae* (Kp). Antibiotic susceptibility profiles (disk-diffusion/broth microdilution) and plasmid characterization (PCR-PBRT/pMLST/sequencing) and location (I-Ceul/S1-PFGE-hybridization) were performed.

A high occurrence of *mcr*-1 (MIC=4->16mg/L) was detected in chicken meat samples (68%-molecular/62%-cultural approaches). MDR Ec isolates (n=90/28 samples/21 farms) were distinguished in 5 FT-IR-groups/STs belonging to PhG F or B1. *mcr*-1 was located in the chromosome or commonly described plasmids (IncX4, IncHI2 and IncI2). MDR Kp isolates (n=16/7 samples/6 farms) belonged to one *wzi*23 clone carrying *mcr*-1 in IncHI2 plasmids. Four Ec/Kp clonal lineages persisted over time.

Poultry-production chain are a major reservoir of MDR Enterobacteriaceae carrying *mcr*-1 gene and a potential source for their transmission from chicken meat to humans. Strict colistin-resistance/*mcr* monitoring, global re-assessment of colistin use in food-producing animals and alternative food safety interventions are urgently needed in a One Health context.

- 16783 | Evaluation of morphology and phase transformation on unsintered zirconia treated with different temporal widths pulse of Er: YAG laser.

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The aims of this study was the evaluation of effects of different Er:YAG laser pulse width protocols on morphology and phase transformation on pre-sintered zirconia. Blocks of pre-sintered Y-TZP (Yttrium-stabilized Tetragonal Zirconia Polycrystal) were sectioned providing 28 standard samples. Afterwards, they were sanded with a decreasing sequence of sandpaper for surface standardization. The specimens were randomly assigned to seven experimental groups (n = 4) according to the following surface treatment: GC (untreated); GSSP (85mJ / 5Hz / 50µs); GMSP (85mJ / 5Hz / 100µs); GSP (85mJ / 5Hz / 300µs); GLP (85mJ / 5Hz / 600µs); GNAT (tribochemical silica coating before sintering); GAT (tribochemical silica coating after sintering). After testing, specimens were sintered in a specific furnace according to manufacturer's recommendations. Except for the GAT group, where all specimens were sintered prior to surface treatment. The specimens were characterized by two methods: morphological analysis by Scanning Electron Microscopy (SEM) (n = 3) and evaluation of phase transformation of zirconia, by X-ray Diffractometry (XRD) (n = 1). Morphological analysis revealed that irradiation of zirconia surface with the Er:Yag laser promoted an effective ablation irrespective of the pulse width. These surfaces had a more heterogeneous topography when compared to the control group (GC) and the groups treated with tribochemical silica coating before (GNAT) or after (GAT) sinterization. The X-ray Diffractometry detected diffraction peaks corresponding to the monoclinic phase only in the GAT group, in the other groups only the tetragonal phase was observed. Thus, taking into account the protocols used, an Er: YAG laser irradiation causes uneven surfaces without cracks or carbonization, being an alternative method for surface treatment of Y-TZP. Procedures performed in a presintered phase appear to have advantages in not inducing a phase transformation.

- 16784 | Metabarcoding vs Microscope Approaches to Study Arctic Eukaryotic Microbiome

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Climate change is affecting the Arctic Ocean through the decrease of the sea ice extent and thickness. As sea ice gets thinner and with the replacement of multi-year ice (MYI) with first-year ice (FYI), the dynamics of phytoplankton and primary productivity has been changing. These changes are radically redefining the biogeography of marine Arctic ecosystem, leading to a redistribution of species, however the consequences of this biological reorganization are not yet known. In our ongoing research we proceed with a comprehensive comparison between the 18S metabarcoding approach, using next generation sequencing techniques (NGS), and the classic microscope cell identification. Our aim, is to study the biogeographic patterns of Arctic phytoplankton diversity and distribution along two oceanographic transects in the Marginal Ice Zone (MIZ) around Svalbard. Microbial phytoplankton samples were concentrated on board through filtration, during an Arctic oceanographic campaign, led by Norwegian Polar Institute (NPI), and sent to CIIMAR (Portugal, Porto) for following environmental DNA extraction and metabarcoding analysis. Microscope phytoplankton counts and identification were performed on board in fresh samples, then preserved samples were also later analysed at IO PAN labs (Sopot, Poland). Results, revealed that the Eukaryotic data set comprises highly complex and diverse protists community structure, with a marked biogeographic pattern of the Protists communities along the Svalbard Marginal Ice Zone with strong links identified between protists communities distribution and environmental gradients along the transects. This research is relevant to fill critical gaps concerning the evaluation of the response of the changing eukaryotic microbiome in response to climate change impacts.

- **16786 | Neoantigen signature algorithm to predict immunotherapy response**

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Cancer is caused by mutations leading to abnormal growth of cells that possibly invade nearby tissues with time. These alterations may lead to an immune response such as T-cell recognition, in which antigens mediate the communication between the major histocompatibility complex (MHC) from tumor cells and T-cell receptor. Therefore, the immune system recognizes specific tumor neoantigens and block the tumor progression by eliminating the existent tumor cells. However, tumor cells develop strategies to block the T-cells' response. Immunotherapy has been at the forefront of oncology strategies to treat cancer. This approach takes advantage of the immune system through T-cells to destroy cancer cells and stop tumor progression. Although great results have been observed in patients, a fraction does not respond to this therapy. As a result, it is mandatory to develop tools for a proper assessment of patient therapy response and establish the best treatment strategy. The aim of this project is the development of an algorithm able to predict immunotherapy response through neoantigen signatures.

In this study, through bioinformatic analysis, we are developing an approach to ultimately score a tumor's likelihood of response to immunotherapy. Tumors from mice models, with different levels of mutations, are characterized at mutational burden level using DNAseq, and the gene expression profiles are assessed through RNAseq, to identify which mutations are transcribed. The affinity of translated molecules for MHC is then converted into a score since this interaction is crucial to activate the cascade of immune response. This scoring scheme will allow a more accurate selection of biomarkers as targets to maximize therapeutic benefits, validated with in vivo experiments using groups of animals treated with immunotherapy and untreated.

- **16787 | Synthesis and structure elucidation of chiral amino acid derivatives of chrysin**

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Chrysin (5,7-dihydroxyflavone) is a common flavonoid, one of the constituents of *Orocyllumineicum vent*, possessing a wide range of biological and pharmacological activities [1]. Results from previous *in vivo* tests demonstrated that chrysin exhibited poor solubility, low intestinal absorption and a fast metabolism of glycosylation [2]. The incorporation of amino acids could lead to compounds with an improved bioavailability and a superior selectivity, efficiency and permeability [3].

The aim of this project was to synthesize pure enantiomeric derivatives of chrysin using commercially available enantiomerically pure reagents as building blocks and coupling reagents (TBTU and COMU) [4]. Herein, the synthesis of eight new chiral derivatives of chrysin was described using the enantiomers of commercial amino acid methyl esters and further hydrolyses to obtain the amino acid derivatives. The structure elucidation was performed by IR, ¹H and ¹³C RMN. The new compounds will be further assessed for their biological activity and enantioselective studies.

This work was supported by the Strategic Funding UID/Multi/04423/2019 through national funds provided by FCT and ERDF, through the COMPETE - POFC program in the framework of the program PT2020; the project PTDC/MAR-BIO/4694/2014 (reference POCI-01-0145-FEDER-016790 and 3599-PPCDT), co-financed by COMPETE 2020, under the PORTUGAL 2020 Partnership Agreement, through the ERDF, and CHIRALBIOACTIVE-PI-3RL-IINFACTS-2019.

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- 16788 | Monitoring program of the São Roque Park (Campanhã, Porto, Portugal) free roaming cat (*Felis catus*) colony

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S. Roque Park cat colony is one of the urban colonies found at Porto. As in all urban environments where free-roaming cats are present it might mean health and security issues, and human-animal conflict source. The study of urban cat colonies is therefore fundamental to fully understand the nature of the problem, as well as to evaluate the control interventions implemented to solve the free-roaming urban cat problem.

S. Roque Park cat colony is being monitored since July 2019. Monthly visits (morning and afternoon) and camera trapping (night, since November 2019) allow to register cat presence. All cat seen are photographed to build a database; their location within the park area is registered; cat sex is registered whenever possible. During November a catch-neuter-release (CNR) intervention allowed to determine cat sex; hereafter neutered cats can be identified (tip of the ear cut off). The data collected allow to understand cat use of the space, as well as the daily and seasonal cat behaviour. Cat caregivers, handouts location and periodicity have been identified.

So far 37 cats have been identified by direct observations and 2 cats during the CNR intervention; 8 cats were photographed by the trap cameras but positive identification was not possible so far. The monitoring visits results seem to point out that some cats are not a regular presence, but only occasionally seen. Sex ratio, determined during surgical intervention and with direct observations is 17♂: 18♀. Two litters were identified so far, but most cats are adult. Cats seem to be more active during the day, probably as a response to the handouts supply schedule.

The results are still scarce but we expect they might allow us to understand the colony dynamics, namely if there are any cat input from new litters of colony cats that escaped the CNR program, non-neutered free-roaming cats from the park neighbourhood, from neighbourhood domestic cats or even of cat litters abandoned in the vicinity of the park.

- 16793 | Study of the enzyme Phosphoenolpyruvate Carboxylase as a step towards the development of a biological-based CO₂ capture device

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As a result of many human-related activities, CO₂ has been accumulated in Earth's atmosphere, leading to the levels reported nowadays.

The global warming, the deicing, the rise of sea levels and the imbalance of ecosystems are considered as plausible threats that result from the long-term effects of such levels. Furthermore, if actual CO₂ levels already present a warning, the trend in our strongly-industrialized society is their rising.

In such a perspective, reduced emissions are important but not enough, and direct air capture (DAC) devices emerge as solutions. Actual DACs, however, do not meet the required rates of CO₂ withdrawal, which justifies further research on the topic. Plant enzymes, immobilized in a proper matrix, may fit as new options.

In this work, we have applied computational methods to study phosphoenolpyruvate carboxylase (PEPC), an enzyme that is involved in the capture of CO₂ by many species of plants. This enzyme catalyzes the carboxylation of phosphoenolpyruvate into oxaloacetate.

The crystallographic structures of PEPC that are available at Protein Data Bank were compared on the basis of resolution and completeness criteria.

Alignment tools and visualization software were used to build a PEPC-substrate model that combines a Zea mays PEPC x-ray structure, a phosphoenolpyruvate molecule and HCO₃⁻ (a CO₂ derivative). This structure was subsequently protonated, neutralized, included in a water box and submitted to energy minimization calculations using the AMBER Molecular Dynamics Package. The overall scaffold of the minimized complex was compared to the crystallographic one and an analysis of the catalytic-relevant interactions was performed.

Further steps will include the study, at an atomic level, of the catalytic machinery of PEPC. To do so, Quantum Mechanics/Molecular Mechanics methodology will be employed, which treats the active site with a quantum mechanics method, and the remaining part of the enzyme with a molecular mechanics approach.

- **16794 | The Comparison of Prevalence and Agreement Between Different Frailty Assessment tools in Oncologic Patients**

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Introduction: Frailty is increasingly recognized as a valuable measure for the preoperative assessment of patients submitted to surgery in different settings. This syndrome is characterized by a decline in the reserve of multiple physiological systems, decreasing tolerance to stresses. Frailty is a strong predictor of postoperative outcomes, it allows clinicians to provide a tailored intervention to optimize the patient before surgery [8] and thus increase tolerance to surgical stress. Nevertheless clinicians will find difficulties when choosing an instruments, as a gold standard measure of frailty does not exist and a wide range of frailty instruments are used. The aim of this study was to compare the prevalence and agreement between 5 widely used frailty instruments in patients with cancer undergoing surgery.

Methods: Patients with gastrointestinal cancer and head and neck cancer were recruited at the IPO-Porto. Frailty was assessed with the VES-13, Fried Criteria, 8FuG, 5m gait speed and the handgrip test. We compared the prevalence of frailty and the concordance between the different tools.

Results: We recruited 166 patients, 53.3% of patients had gastrointestinal cancer and 46.7% head and neck cancer. Patients' mean age was 61.8 ± 11.50 years old, and 77% (n=128) were male, mean weight was 69.1 ± 15.84 kg. Frailty prevalence was 37.3%, 25.9%, 20.49.4% 8.2% as assessed by hand grip, VES-13, FP, 5m gait speed and 8 foot up and go, respectively. A small-moderate correlation and concordance was found between the instruments.

Conclusion: Our results suggest that Fried, VES-13, 5m gait speed, Up and go and Handgrip categorize different patients as frail or non-frail. This finding emphasizes the need for consensus on the definition of frailty, requiring further work to optimize the choice of frailty tool.

- **16796 | Botanical Treasures from São Tomé e Príncipe Islands at PO Herbarium of the Museum of Natural History and Science (U.Porto)**

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The Herbarium of the Natural History and Science Museum at Porto University (PO Herbarium) harbors a vast collection of Portuguese and former Portuguese colonies flora, such as Sao Tome and Principe islands. This collection is composed of specimens brought by several collectors, the majority from the 1950s by the botanist and professor Arnaldo Rozeira. He accompanied three botanical missions to collect specimens to be studied for the better knowledge of Portuguese colonies. The collection is accompanied by documentation such as correspondence, photography, manuscripts, notebooks, inventories and definitive publications.

The curatorship work of this collection consisted of searching through the herbarium all the specimens from the Sao Tome e Principe, repackaging, numerating and producing a database with the information corresponding to each specimen and its meta-data to make it available to the museum (MHNC-UP) and online databases (GBIF).

We obtained a database corresponding to the 8880 herbarium sheets and packages of Sao Tome and Principe Islands of lichens (66 taxa), fungi (1 taxa), algae (69 taxa), bryophyte (1 taxa), pteridophytes (1148 taxa) and vascular plants (4361 taxa), including Typus specimens (7 taxa). The majority of taxa are from Sao Tome island - 2571. Principe Island has 1389 taxa. In total, 2101 herbarium specimens are unidentified and only 51 have no information at all. The collectors of this collection include names such as Francisco Newton, Alphonse Moller and Joaquim Espírito Santo and its main contributor Arnaldo Rozeira, responsible for 3817 entries.

This vast collection is clearly understudied with more than a third unidentified. Hopefully this study brings attention to this collection, increase the interest and studies of its herbarium specimens and documentation. We will present the highlights of this collection and the first facts as figures found and lift the veil of the value of this collection for the University and for Science.

- **16798 | The effects of doxorubicin and mitoxantrone in the spleen of mice at different ageing stages**

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Doxorubicin (DOX) and mitoxantrone (MTX) are two drugs used in chemotherapy. They both are topoisomerase II inhibitors, with a wide activity against tumour cells. They present high toxicity, causing myelosuppression.

We aimed with this work to assess the effects of DOX or MTX in the spleen of male outbred CD-1 mice at different ageing stages (infants-4 weeks and adults-3 months).

All animals received biweekly an intraperitoneal administration of each drug, for 3 weeks. Adult and infant mice received a total cumulative dose of 6 mg/kg MTX or 18 mg/kg DOX, and a second group of adults received 9 mg/kg DOX. Control mice were injected with saline solution. Animal welfare was monitored daily. The sacrifice of the animals occurred 1 week after the last administrations in adults and 17 days in infant mice. Total animal weight, spleen and brain weight were measured at sacrifice. To evaluate spleen's energetic status, ATP was measured. Total glutathione (tGSH) was also measured to assess the redox status of the spleen.

The weight of DOX 18 mg/kg-treated adult animals was significantly decreased at sacrifice, while infant treated with the same dose had no significant changes. Total weight of the spleen of MTX-treated infants was significantly lower when compared with the DOX-treated animals. Regarding ATP measures and tGSH, no differences were seen between groups in either adult or infant mice. In conclusion, our data suggest that DOX or/and MTX have potential spleen toxicity, which needs further study.

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- **16802 | Columba I: A Milky Way Ultra-Faint Satellite**

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There is an abundance of stellar systems in the surroundings of the Milky Way. Some of these systems are ultra-faint dwarfs, which are the oldest, the most dark-matter dominated and the most metal-poor stellar systems known. Columba I is a distant ($d \sim 180$ kpc) ultra-faint dwarf candidate that was discovered as an overdensity of red giant branch stars in Dark Energy Survey Year 2 data by Drlica-Wagner et al. (2015). Here we aim to understand if this system is, in fact, an ultra-faint dwarf (UFD) or a stellar cluster. In order to determine which type of object Columba I is, data from public images from the Hubble Space Telescope and from the Multi Unit Spectroscopic Explorer (MUSE) Integral Field Spectrograph were used. After the reduction of the data from the MUSE instrument, it was possible to extract the spectra of the stars and measure their velocities and metallicities. By discarding the detected sources that don't belong to Columba I and ensuring the membership of the final data selection, it was possible to calculate the velocity dispersion and, consequently, understand that our system falls in the UFD category.

- **16803 | Generation of a GUS:AGP21 marker line of *Arabidopsis thaliana***

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Arabinogalactan proteins are highly glycosylated proteins present ubiquitously in the plant kingdom. These proteins can be found in the reproductive tissues of plants and are thought to contribute to the orientation and growth of the pollen tube until it reaches the ovule.

Arabinogalactan protein 21 (AGP21) is a potential target of the transcription factor SEEDSTICK, which is associated with the development of seeds, flowers and the determination of the identity of floral organs. Thus, the proteins coded by genes regulated by SEEDSTICK are essential for reproduction in plants.

Therefore, this work aimed at the identification of *Itálico*AGP21*Itálico* expression pattern and, by the use of Gateway cloning technology, to create a construction with the GUS reporter gene under the control of the AGP21 promoter. In this study, the presence of GUS activity conducted by the *Itálico*AGP21*Itálico* promoter was observed in anthers and pollen grains, pollen tubes, valves and septum of young pistils and in the calazal endosperm. This activity may suggest the involvement of this protein in the processes of formation of pollen grains, fusion of the carpelar leaves of the pistil and also embryo nutrition.

- 16805 | Identification of new biomarkers in gastric cancer – the role of the epitranscriptome.

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Gastric cancer is the fifth most common and the third cause of death by cancer worldwide. It has been noticed a decrease in its incidence, but the prognosis remains poor due to the late diagnosis and the lack of more efficient therapies.

For these motifs, it's important to identify new biomarkers of prognosis and therapy response, as well as new therapeutic targets.

mRNA chemical modifications, namely methylation of the adenines (m6A) alter mRNA expression and the respective proteins. This process is executed by the combined activity of enzymes called "readers" (identify the adenines), "writers" (methylate the adenines) and "erasers" (remove the methylation). The expression and function of these enzymes are still unknown in cancer.

The aim of this study was to determine if YTHDF3 was a biomarker in gastric cancer, through the evaluation of its expression by immunohistochemistry in a series of gastric carcinomas operated in Centro Hospitalar de S. João, with clinicopathological and treatment data.

The results revealed that 61% of the cases expressed this enzyme while 39% either didn't or had low expression. We identified a significant association between the expression of this protein and clinicopathological parameters: Laurèn and WHO classification, and perineural invasion. Low expression of YTHDF3 was more frequent in diffuse, papillary and poorly cohesive tumours, as well as in tumours with perineural invasion. In addition we identified an association between the YTHDF3 expression and the chemotherapy response, particularly in patients with tumours in stage III and IV. After stratification of the patients based on the administration of adjuvant chemotherapy, it became clear that the patients with high expression of YTHDF3 had a superior response to chemotherapy than those with low expression.

Thus, the results suggest that m6A modifications have an impact in the biological behavior of gastric cancer and that this enzyme may be useful at the clinical level.

- **16806 | Anthropometric values of older people in Portugal: results from the Nutrition UP 65 study**

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Introduction: The accentuated aging of the Portuguese population raises several health concerns and anthropometry can provide important indicators of nutritional status. Given the high variability of anthropometric characteristics among older people and the lack of anthropometrical data for this age group in Portugal, this work aims to describe the anthropometric values of the Portuguese older population.

Participants and methods: Based on the Nutrition UP 65 cross-sectional study, a sample of 1500 older individuals aged ≥ 65 years, representative of the Portuguese population regarding sex, age, educational level and geographic regions (NUTS II) was evaluated. Data on weight, height, body mass index, triceps skinfold, and middle-arm, waist and calf girths were reported in percentiles by sex and age group. Weight and height were also compared with available data from elder populations of different nationalities.

Results: After the exclusion of 4 individuals with missing data, anthropometric values were described for 1496 participants. Percentiles 5, 10, 25, 50, 75, 85, 90, and 95 were calculated. Regarding WHO BMI cut-offs, 3 (0.2%) were underweight, 249 (16.6%) were classified as normal weight, 662 (44.3%) were pre-obese and 582 (38.9%) were obese. Comparing the weight values of this sample with those of other nationalities, only the Turkish, Swedish, Australian, and the American presented superior weight values, for both sexes. Regarding height, the majority of the older women of other nationalities presented superior values to that of the Portuguese. However, these differences were lower for men.

Conclusion: The present study confirmed the high prevalence of overweight and obesity in this age group. This description of the anthropometric values of the Portuguese elderly population may contribute to the early implementation of intervention health measures directed to older individuals.

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- **16807 | Soft drinks with artificial sweeteners: a decade of evolution**

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Non-nutritive sweeteners (NNS) are being increasingly used as sugar substitutes in food and beverages, particularly in soft drinks, aiming to reduce the ingestion of free sugars, thus helping reduce overweight, obesity and diabetes. On the other hand, the increased use of NNS as sugars substitutes might have other health implications.

A total of 58 soft drinks selected among those whose label indicated the addition of NNS, regardless of including added sugars, were acquired and grouped into colas (N=12); juice drinks (N=23); iced tea (N=12) and lemon flavoured soft drinks (N=11). The analysis of NNS was performed by RP-HPLC-ELSD and duly validated.

Samples revealed the use of aspartame (ASP), acesulfame K (ACSK), cyclamate (CYC), saccharin (SAC) and sucralose (SUC) at different ratios, which varied according to drinks group. Nevertheless, the main NNS were CYC, ASP and ACSK ranging from 129 to 266 mg/L, 31 to 231 mg/L and 32 to 142 mg/L, respectively, all below the maximum legal limits. There were no significant statistical differences between drinks groups ($p \leq 0.05$) and CYC was the one in the highest amounts in all groups, reaching up to 249 mg/L. In comparison to a survey from 2008, with 34 samples in common, half of them (N=18; 53%) reduced the sugars concentration supported on the addition of NNS or by using a higher amount of NNS. Globally a reduction of ASP and an increase in CYC and SUC was observed. The high CYC amounts over several beverages deserve more attention, particularly in small children. Unfortunately, these reformulations apparently did not attempt to reduce sweet taste intensity, which, if gradual, could constitute a long-term educational measure.

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- **16809 | An indirect co-culture model of osteoclastogenesis**

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Bone is constantly being remodeled, a process accomplished by the concerted action of the osteoclasts, responsible for bone resorption, and the osteoblasts that re-build the new bone mineralized matrix. Osteoblastic cells have a key role in osteoclast differentiation by paracrine mechanisms involving the synthesis of M-CSF and RANKL, two positive regulators of osteoclastogenesis, and Osteoprotegerin (OPG) a negative regulator of osteoclastogenesis. A variety of hormones, cytokines and drugs impairs bone metabolism indirectly, acting via M-CSF and RANKL/OPG pathways. This work aims to establish an indirect co-culture model of osteoclastogenesis, easy to implement and mimicking the physiological conditions, i.e. using osteoblastic cells as a source of the osteoclastogenic factors. Two routinely used cell lines were used: the acute human monocytic leukemia cell line THP-1, as a source of the osteoclastic precursors, and the MG63 osteoblastic cell line, known to produce high levels of M-CSF, RANKL and OPG. The indirect co-culture system was implemented using 24-well plates with a Transwell® membrane (an insert with a pore size of 0.4 µm polyester membrane) to separate the two cell populations. THP-1 cells, cultured on the bottom of the well, were first differentiated into adherent macrophage-like cells (with phorbol 12-myristate 13-acetate, PMA, 48 h). At this stage, inserts containing previously cultured MG63 cells were added to the wells containing the THP-1 cells to establish the indirect co-culture. As a control, THP-1 cells (also treated with PMA) were monocultured with M-CSF and RANKL. Differentiation of THP-1 cells cultured with the factors (control) or co-cultured with MG63 cells were evaluated throughout 14 days of incubation. Results showed that MG63 cells significantly induced osteoclastogenesis compared to the supplementation with M-CSF and RANKL, suggesting the suitability of this model to address osteoclastogenesis in a variety of experimental settings.

- **16811 | Fat tissue: a source of stem cells for bone regeneration**

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Adipose-derived stromal cells (ADSCs) have been recognized with potential interest in the regenerative medicine field of mesenchymal tissues, as adipose tissue can be harvested in greater volume and by minimally invasive techniques compared to other sources. In addition, isolated cells are highly proliferative, with self-renewing capability and potential to differentiate into different mesenchymal lineages. Despite the existing studies on the impact of ADSCs collection and isolation procedures, little attention has been given to the differences on the anatomical location of fat tissue harvest, as well as on the potential differences regarding the functional activity of isolated ADSCs. Accordingly, this study aimed the isolation and biological characterization of rat ADSCs, harvested from different anatomical locations, i.e., subcutaneous, perirenal, peri/epicardial, mesenteric, and brown adipose tissue, and its assessment regarding the osteogenic potential.

The adipose tissue was isolated and stromal cell cultures were established through an enzymatic dissociation process. Obtained cultures were grown and characterized at different periods, through biochemical, histochemical and gene expression analysis. Results demonstrated a distinct biological behavior of cultures established from adipose depots of different anatomical location, namely in morphology, proliferation and functional activity. Cultures obtained from subcutaneous adipose tissue expressed higher levels of early osteogenic markers, while those from perirenal location presented higher expression of later osteogenic markers.

These findings support a distinct pattern of activity of cultures grown from different anatomical locations, highlighting the need of a thorough selection of the anatomical location, for optimizing the harvest procedure, in accordance with the intended therapeutic application.

- **16816 | Ecological evaluation of water quality of Ribeira do Inferno**

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The Water Framework Directive (WFD) is a European Union (EU) policy that compresses several elements in order to achieve water quality, namely physical and chemical parameters and biological evaluation. It sets guidelines for a standard and comprehensive water quality evaluation across the EU member countries. Benthic macroinvertebrates are used to assess the ecological water quality of rivers, due to their sensitivity to different water pressures (e.g. pollution, climatic changes). The main scope of this study was evaluating the ecological status of Ribeira do Inferno (Valongo, north of Portugal) followed the analysis of the elements proposed by WFD. Water and benthic macroinvertebrates were collected along of Ribeira do Inferno (RI_2 and RI_3) for further laboratory analysis. Additionally, several physical and chemical parameters were measured in situ. At laboratory, biological samples were sorted by morphological appearance and identified using identification keys. Biotic indices (abundance, diversity, richness, Índice Português de Invertebrados do Norte - IPTIN) were calculated to assess biological water quality. The results obtained for physical and chemical parameters showed acidic values (RI_2 pH = 6.7, and RI_3 shown a pH of 4.94), typical values for this geographic region, however, below for the optimal range ($6.5 \leq \text{pH} \leq 9.5$) for the good ecological water qualification. In RI_2 low levels of ammonium were recorded while in RI_3 the low concentrations were also observed on nitrates, and phosphates. RI_2 also presented higher levels of dissolved oxygen compared to RI_3. According to physical and chemical parameters Ribeira do Inferno was classified by a good ecological status. Regarding benthic macroinvertebrates community, a low abundance and richness was recorded in the two sampling sites, however an increase of richness was observed in RI_2.

Keywords: macroinvertebrates, water pollution, Water Framework Directive, river

- **16817 | Monitoring of Floating Wetland Islands in marina environment**

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Floating Wetland Islands (FWI) are considered nature-based solutions that can be applied in several water bodies, such ponds, lakes and rivers, for water quality enhancement and biodiversity promotion. Briefly, FWI include a floating platform with emergent vegetation and an anchoring system. The upper parts of the vegetation grow and remain mainly above water level, while the roots extend into the water column, developing an extensive root system where water depuration takes place.

The present work addresses the monitoring of two floating islands, with selected halophytes (*Sarcocornia perensni*, *Halimione portulacoides*, *Spartina maritima* and *Inula crithmoides*), one coated with coconut fiber and the other uncoated, in marina environment. Regarding the selection criteria of the plants, it was preferable to use perennial and saltwater environment plants. The main objective in this first phase of the project is to systematically monitor the adaptation of aquatic plants to the platform surface, observing their growth and survival in the marina environment, taking into account parameters such as salinity, tidal oscillation, temperature, pH, conductivity, among others. In addition, the biotic communities associated with the FWI are being characterized, namely in terms of microbial communities and macrofauna. Obtained results will contribute with new knowledge regarding FWI dynamics in order to promote their efficiency in marine environment.

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- **16818 | Antimicrobial xanthenes via Suzuki carbonylative reactions**

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Xanthenes are a class of secondary metabolites that have been isolated from different environmental sources and obtained by chemical synthesis. In nature they are secondary metabolites presenting relevant biological activities, including antimicrobial activity [1]. Due to their importance in Medicinal Chemistry, various synthetic routes have been described to achieve diverse xanthone derivatives [1-3]. However, these pathways have some limitations, requiring multi-step procedures and harsh reaction conditions. The search for simpler and more environmentally friendly methods to obtain xanthenes has been an important issue in our group. Bearing this in mind, our group have been exploring the potential of the carbonylative Suzuki cross-coupling as a one-step reaction to obtain benzophenones, which can be easily cyclized to xanthenes [4,5].

For that purpose, ten syntheses were explored using eight aryl bromides, under different reaction conditions, namely, the base and the solvent. The results are presented and discussed, and conclusions were drawn on reactivity, building blocks and the type of base and solvent to be used. The structures of all synthesized compounds were established by spectrometric methods: FTIR, EI-MS, ¹H and ¹³C NMR and HSQC and HMBC.

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- **16819 | Sport Managers' Profile: A Systematic Review**

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The present study is a systematic review about sport managers' tasks and competencies. The main purpose is to map the literature of sport manager's competencies and tasks from 2011 to January of 2019. The search was made on EBSCO, B-on and Open Dissertations, using the following keywords: 'sport managers OR sport directors OR sport administrators', 'sport managers AND qualifications', 'sport managers AND responsibilities', 'sport managers AND traits', 'sport managers AND roles', 'sport managers AND competencies' and 'sport managers AND characteristics' for peer reviewed articles and dissertations. After applying the inclusion criteria, 33 studies were selected. Sport managers are, predominantly, men in their thirties and forties, with a degree in physical education. A sport manager must have competencies such as leadership, integrity, specific knowledge, resource allocation, delegation of authority, motivation of employees and innovative thinking to accomplish the most important and more time consuming responsibilities like planning/organization, coordination/evaluation or information.

- **16822 | Preliminary biocolonization data of Artificial Reef samples in Matosinhos**

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The northeast Atlantic coastal marine environments are the place of many economic activities, including exploitation of natural resources and recreation (e.g. fisheries, aquaculture, tourism). These activities have a direct impact on biodiversity, possibly leading to its loss, and contribute to the establishment of invasive marine species. It is also known that coastal reefs are natural hotspots for biodiversity, which can be compromised due to anthropogenic pressure. As such, actions to preserve and restore coastal marine ecosystems are urgently needed. An ecological tool with potential positive effects on biodiversity is the use of artificial reefs (AR). The successful deployment of AR depends on several factors, namely location, design and materials employed. Therefore, best materials to use and biodiversity and habitat features, pre and post deployment, must be evaluated to assess its success. Common bioassessment tools include non-destructive methods (underwater visual census and remote underwater video) and destructive methods such as substrata scraping for posterior biocolonization assessment in laboratory.

The present work is included in the framework of the European funded project 3DPARE - Artificial Reef 3D Printing for Atlantic Area which aims to develop a new generation of artificial reefs, built using 3D printing technologies, innovative designs and materials, contributing to the sustainable management and recovery of the marine ecosystems of this region. In Portugal, samples of these new AR materials are being tested in Matosinhos bay area. So far, three sampling periods were done and the preliminary results of biocolonization are shown.

Furthermore, assessment of socioeconomic impact of the AR concept and possible deployment in Matosinhos area is being prepared through a survey, based on questionnaires.

Acknowledgements: Project 3DPARE - Artificial Reef 3D Printing for Atlantic Area. Funding INTERREG Atlantic Area (EAPA_174/2016).

- **16824 | Synthesis and structure elucidation of new atropisomers based on xanthone derivatives**

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In the last few years the relationship between chirality and biological activity has been of increasing importance in medicinal chemistry [1]. The number of chiral drugs in the pharmaceutical market and the importance of enantioselectivity studies are increasing each year due to the advantages in potency, efficacy, selectivity and safety associated with the use of single enantiomers [2]. A particular group of chiral compounds, atropisomers (ATIs), whose chirality arises from axial stereochemistry, conferred by the repulsive interactions that inhibit rotation about a single bond [1], have been playing a growing role in medicinal chemistry, especially in drug discovery [3].

In this work, we reported the synthesis of ten new atropisomers by using suitable building blocks, specifically both enantiomers of an atropisomeric chiral amine and carboxylated xanthone derivatives (XCars). To obtain the desired ATIs, the carboxylic acid of XCars were first converted into an acyl chloride and, then coupled, with the amine groups from the chiral building blocks. Structure elucidation of the synthesized ATIs was established by spectroscopic methods.

This work was supported by the Strategic Funding UID/Multi/04423/2019 through national funds provided by FCT and ERDF, through the COMPETE - POFC program in the framework of the program PT2020; the project PTDC/MAR-BIO/4694/2014 (reference POCI-01-0145-FEDER-016790 and 3599-PPCDT), co-financed by COMPETE 2020, under the PORTUGAL 2020 Partnership Agreement, through the ERDF, and CHIRALBIOACTIVE-PI-3RL-IINFACTS-2019.

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- 16826 | Legal discourse and discrimination against women: A critical discourse analysis in two Portuguese judgments about rape.

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Language, ideology and power are intrinsically connected and they influence the way how men and women social roles are established. In fact, the stereotyped values and beliefs based in a patriarchal structure of society determine asymmetric relations between the genders. This research has as general aim to analyse the legal discourse in Portuguese court decisions about rape in order to investigate how the legal language stands in relation to gender-based violence and how it may represent and consolidate the stereotyped social roles between men and women. The analysis of this research is based on the Critical Discourse Analysis perspective and it aims to investigate two Portuguese court decisions about rape, dated in a date range of almost 30 years (1989 and 2018). The data was collected from the IGFEJ (Instituto de Gestão Financeira e Equipamentos da Justiça IP) legal documentary base. According to the preliminary results, through linguistic analysis of judgments and also theoretical considerations, it is possible to verify how the legal language can represent, reinforce and disseminate the male hegemony and the discrimination against women. Due to the fact that the legal discourse is a discourse of power and social influence, it is necessary to embrace different discursive practices, more equitable ones, in such a way that sexist ideologies are not diffused by the legal discourse and it can really expose the violence the way it is, with no mitigation of the real offenders and blaming of the victims.

Keywords: Critical discourse analysis; Legal discourse; Ideology; Power; Gender-based violence.

- **16828 | Seasonal Biomass Dynamics of Seaweeds with Commercial Interest in Three Rocky Shores of Northern Portugal: Belinho, Aguçadoura and Viana Do Castelo**

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Canopy forming seaweeds are important ecosystem engineers, primary producers and habitat providers to numerous organisms on rocky shores. Several seaweed species can be used as a sustainable source of bioactive compounds for food and feed supplements, pharmaceutical and biomedical industries or even as fertilizers or biofuel, hence its growing economic interest. This study monitored the seasonal biomass variation and recovery of two seaweed species with commercial value: *Codium* spp. and *Osmundea pinnatifida*. It constitutes the follow-up of an experience that aimed to evaluate the effects of different harvesting methods: cutting and plucking on those species at two rocky shores per species: Viana and Aguçadoura for *Codium* spp., and Viana and Belinho for *O. pinnatifida*. The overall experiment run from April 2018 to November 2019. On each shore three areas (block 1, 2 and 3) were considered and in each area were marked on the rock 50×50 cm plots of each treatment: control, cutting and plucking. The treatments were performed once, at the beginning of the experiment, and plots were monthly sampled using sampling quadrats of 50×50 cm to assess the percentage cover for each species. Percentage cover was converted to dry weight using regression equations previously established. Data analysis is currently under progress and will be aggregated by seasons (Spring/Summer; Autumn/Winter), in order to identify (if any) the best season and method for harvesting these seaweed species. These results will be relevant for the application of future conservation measures or for the regulation of future sustainable harvesting plans.

- 16831 | Assessing the effects of a sport-related occlusal splint on football performance

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Wearing occlusal splints during sport practice has been studied for many years given the relevance of dental protection during high-force collisions. Despite their traditional protective role, dental splints have emerged as a potential performance enhancer via improved respiratory capacities, strength, aerobic and anaerobic performance. However, longitudinal studies on this topic are scarce. Our purpose is to study the effect of a specific sports-related splint on football players technical and physical performance after a 16-week in-season training using a 50% intraoral advancement device. Adult professional male football players (n=20) will be randomly assigned to a control (n=10) and an experimental group (n=10) based on a homogeneous distribution of the field position, age, anthropometric characteristics and playing time (from previous season) on the official football matches. Throughout the season, subjects will train over a 16-week period without an intraoral splint (control group) or wearing a customised 50% mandibular advancement occlusal splint. Both groups will be evaluated five times (four weeks apart) on a football-specific skill assessment protocol. Technical competency will be evaluated including passing accuracy, short-passing performance, dribbling speed and wall-passing tests. Kicking speed will be recorded by a sports radar gun for kinematic analysis. Physical performance will include the Yo-Yo intermittent recovery test level 1, arrow agility test, horizontal jump and sprint speed (5, 20 and 30 m measured by photoelectric cells). Repeated measures and independent t-tests will be performed to compare the differences between pre-post training and groups, respectively. Our hypothesis is that wearing a 50% advancement splint over a short-term period will improve both football technical and physical performance.

- **16832 | LEVEL OF KNOWLEDGE ABOUT ANISAKIS, A PARALLEL BETWEEN TWO GROUPS WITH DIFFERENT BACKGROUNDS**

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Anisakiasis is a zoonosis resulting from the accidental ingestion of viable anisakid larvae in raw or undercooked fishery products. Due to the growth of international trade and the popularization of food consumed without cooking, as the Asian food, this parasitosis deserves now extra attention. This study evaluated the level of knowledge that a group of 81 peoples have about Anisakis and its potential health risks. For data analysis participants were divided into: Group 1, random people without specific knowledge about Anisakis and Group 2, teachers that participated in a Course "Laboratory of Parasitology - application in school context" - Faculty of Sciences of the University of Porto, in 2019, where the topic was included. Most components in both groups (Group 1 and Group 2) recognize parasite transmission as a problem associated with raw fish consumption. It was also evidenced that all components of Group 2 specifically know the existence of the Anisakis worm, while in Group 1 only a small portion know it. Regarding methods of prevention against Anisakis, 33% of Group 1 said they knew, in contrast to Group 2 in which 100% of the components affirmed this knowledge. However, although the Group 2 components have a deeper knowledge of Anisakis topic, only 38% hit the three main methods of disease prevention (ie gutting, cooking and freezing). Thus, we realize the need for greater dissemination of information about Anisakis, its potential dangers to human health and methods to avoid it.

- **16841 | Bioremediation of soils contaminated with hydrocarbons**

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Soil is a particularly vital natural resource for society as it serves not only as a structural base, providing mechanical support, but also as a source of water and nutrients for plants and raw materials for construction and other industries. As such, it is a resource under intense anthropogenic pressure, and, as it is not renewable within the human time scale, it must be protected. The present work is based on the environmental concern of soil protection, aiming to reverse the effects of contamination that it may suffer, specifically, contamination by hydrocarbons, which is a frequent problem, considering that our technologies are heavily based on the use of fossil fuels, with lots of adverse effects on human and environment health.

Aiming to eliminate such contamination, it was studied the effectiveness of bioremediation, by cultivating bacteria found in the soil of a refinery, specifically near the crude and aromatic storage tanks, and analyzing whether these two locations have different bacterial cultures, and how efficient those are in recovering the soil. To do so it was used a granitic residual soil contaminated with known concentrations of benzene and bacterial inoculum from the two different locations, totalizing twelve different combinations of contamination and inoculum. These experiments were kept at constant temperature, to simulate the field conditions. The concentration of benzene in the gas phase was measured through chromatography. The results obtained so far can confirm that both locations have bacteria capable of degrading benzene, with a small variation in the degradation rate.

- 16842 | Characterisation of invariant natural killer T cells in Gaucher disease and correlation with memory B cells

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Gaucher disease is an autosomal recessive genetic disease caused by a deficiency in the enzyme glucocerebrosidase, which leads to the accumulation of β -glucosylceramide in the lysosomes.

Human invariant Natural killer T (iNKT) cells are CD1d-restricted lymphocytes that use the V α 24J α 18 combined with the V β 11 T cell receptor segments. α -galactosylceramide (α -GalCer) and α -glucosylceramide (α -GlcCer) are iNKT lipid antigens. It is known that there is a crosstalk between iNKT and B cells, and in Gaucher disease B cell related pathology is frequent.

This study aims to assess if the abnormal lysosomal storage of β -glucosylceramide in Gaucher disease influences the frequency and phenotype of α -GalCer and α -GlcCer reactive iNKT cells, which could be promoting a difference in B cell memory phenotype.

In total, 14 Gaucher disease patients and 16 control subjects were studied. Peripheral blood mononuclear cells were isolated from blood and stained for flow cytometry analysis. In the characterization of α -GalCer and α -GlcCer reactive iNKT cells, human CD1d tetramers loaded with these lipids were prepared in-house and used together with anti-CD4 and anti-CD8 monoclonal antibodies. B cell memory subsets identification was based on CD27 and IgM molecules expression.

No differences were found between Gaucher disease patients and controls probably due to the low number of subjects. However, we found interesting results in the analysis of the pool of subjects. Comparing with α -GlcCer reactive iNKT cells, we found a higher percentage (0.014 ± 0.028 , $p < 0.05$) and a higher mean fluorescence intensity (411.4 ± 409.7 , $p < 0.01$) for α -GalCer reactive iNKT cells. There were no differences in the CD4 and CD8 subsets of α -GalCer and α -GlcCer iNKT cells. Furthermore, we observed a positive correlation between iNKT CD4+ levels and switched memory B cell (CD27+IgM-) levels in controls ($p < 0.05$).

In the future, we will analyse a higher subject number, and different in-house synthesised tetramers.

- 16846 | Unravelling the hidden flora of show caves: a case-study from Grutas da Moeda, Center of Portugal

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Show caves have been developed for touristic purposes throughout many countries. The installation of sources of artificial lighting inside these caves promotes growth of different photosynthetic organisms. These organisms, usually labelled as "lampenflora" or "lamp flora", are mainly composed of cyanobacteria, diatoms, mosses and ferns, proliferating in the artificial light source vicinities. Its development is a typical problem for show cave management, since these organisms might deteriorate the substrate on which they adhere and be considered to decrease the show value of the caves.

Previous botanical investigations focused on lamp flora of limestone show caves were performed in different countries from Europe (e.g. Spain, Italy, Czech Republic, Slovenia, Hungary). However, in Portugal, only flora of a volcanic chimney entrance in Portugal (e.g. Azores) was catalogued and, to our knowledge, no studies on lamp flora of limestone show caves were reported so far. Because of this lack of information, the aim of the present study was to evaluate species diversity and ecology of lamp flora from "Grutas da Moeda" show caves, one of the six touristic limestone caves reported to continental Portugal.

"Grutas da Moeda" are natural limestone caves, discovered in 1971 and opened to the public in 1974, located at the Center of Portugal (São Mamede Plateau). Floristic research of bryophytes and ferns of lamp flora was carried out in November 2019 to compile a preliminary species inventory. Biological patch samples, abundant in places near the artificial light, were taken in multiple points through the visiting pathway of these caves.

Our study provides a list of the most frequent and abundant species recorded in this visit, the taxa of mosses and ferns found, and its ecological characteristic based on Ellenberg indicator values for moisture, light and soil reaction to the substrate, which may contribute to better understand the impact of lamp flora on such caves.

- **16849 | Design of porous materials for environmental remediation**

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The increasing level of metals in water represents a serious risk to human health and ecological systems due to their toxicity and bioaccumulation.[1] Thus, the removal of these metals from the environment is a subject of uttermost importance. In the past decades, several chemical methods have been applied, such as ion exchange, chemical precipitation and flotation. Nevertheless, most of these approaches have low efficiency and selectivity.[2] Recently, adsorption is considered to be one of the most effective, economic and selective methods for water treatment.[1]

Metal-Organic Frameworks (MOFs) have shown a significant role in the development of new adsorbents due to their porous crystalline structure with high specific surface area provided by coordination of metal clusters with organic linkers via strong covalent bonds.[3] However, there are some limitations regarding their separation and recycling when applied in aqueous solutions and new MOFs are needed.

The present work describes the synthesis of MOF-based materials using different strategies. The preparation of the materials was confirmed by FTIR, powder XRD, TGA and SEM/EDS. Preliminary studies on their adsorption ability for the removal of heavy metal ions will also be presented showing promising results.

Acknowledgments

This work was partly funded through the project REQUIMTE-LAQV (Ref. UID/QUI/50006/2019) and the project GlyGold PTDC/CTM-CTM/31983/2017, financed by national funds through the FCT/MEC and when appropriate co-financed by FEDER (Fundo Europeu de Desenvolvimento Regional) under the PT2020 Partnership Agreement and the project PTDC/CTM-CTM/31983/2017.

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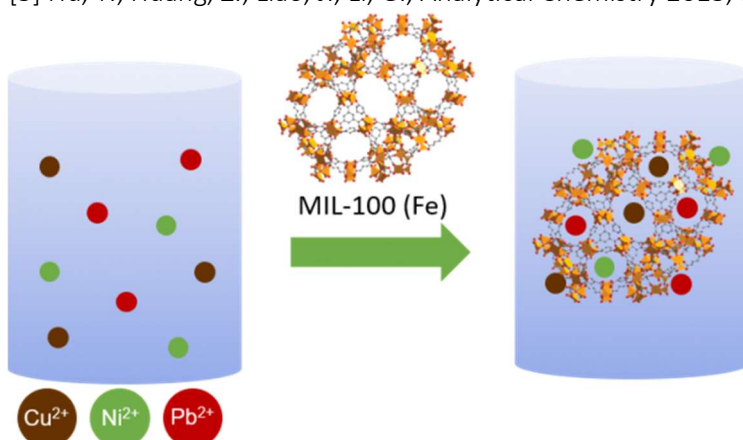


Figure 1. Schematic representation of metal ions adsorbed on MOF MIL-100(Fe).

- 16856 | Cyber hate and communities of practice: a forensic linguistic analysis of performance patterns in Brazilian imageboards

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The current study is a qualitative analysis of Brazilian imageboard comments, which aims to identify linguistic patterns in cyber hate utterances by taking into account contextual resources and constraints present in identity performances of interactants (Grant & MacLeod, 2018) and the relation between lexical (KhosraviNik & Esposito, 2018; Wodak, 2001) and pragmatic (Searle, 1975) choices and the notion of communities of practice (Bucholtz, 1999; Eckert & Wenger, 2005; Holmes & Meyerhoff, 1999). To do so, a total of 381 comments posted between November 2019 and December 2019 from 4 threads of different categories were collected, all of which contained misogynist manifestations. Subsequent to the analysis, the conclusion is that the language usage in this cybersphere presents both full and partial lexical and syntactic borrowings, mainly from English, besides materialising hate speech with hierarchical noun references, which lead to the description of social actors. It was also possible to identify the constant presence of formal register, which brings to light important stylistic markers (Nini, 2018) for sociolinguistic profiling. From these results, the possibility for future work related to this cyberculture in authorship synthesis and sociolinguistic profiling was discussed.

Keywords: Cyber hate, anonymity, identity performance, communities of practice, imageboards.

- 16857 | Parental stress and a sense of competence in parents of children followed by the protective services

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Parental stress influences the quality of family functioning and compromises parent-child interactions as well as child development. Parents who experience high levels of stress tend to be more reactive and coercive, exposing children to risky or dangerous situations. In Portugal, many families are followed by the protective services and have measures applied to prevent family breakdown. These families can face high levels of parental stress, not only because of the factors that contributed to the child's risk situation, but also because of the fear of having their child placed in out-of-home care.

The current study is part of REUNIRmais, a longitudinal research project promoted by the FPCEUP, that aims to assess the effectiveness of an evidence-based positive parenting intervention to prevent family breakdown in families followed by the protective services. The research project is currently being implemented in the 18 cities of the district of Porto.

The purpose of the current study is to: 1) characterize parental stress and parental competence, parental well-being and child stress and behaviour; and 2) test the associations between the family risk factors, and sociodemographic variables, such as age and gender, with parental stress and parental competence, parental well-being and child stress and behaviour.

Participants will be at least 40 parents of 6-to-11-years-old children followed by the protective services. Parents' measures include a sociodemographic questionnaire, the General Health Questionnaire, the Depression Anxiety and Stress Scales, the Parenting Sense of Competence, the Parenting Stress Index, and the Strengths and Difficulties Questionnaire. Children also fill the Maastricht University Stress Inventory for Children. The current study has a cross-sectional design. Results will inform on the parents' stress and parental stress and sense of competence, and children's behaviour and perception of stress, and on how these measures relate.

- 16858 | Towards the within: decorated hearths in fortified Iron Age settlements in NW Portugal

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During the excavation campaigns carried out since 2016 at Campo da Ponte, located in the fortified settlement of Castro de Guifões, and within the context of the Pluriannual Research Plan - GUIFARQ, a pristine example of an Iron Age decorated hearth was found in-situ. This find prompted the attempts to identify and study parallels in the universe of known fortified settlements in the Northwest of Portugal. The relation of this hearth within the context of the site is the subject of my master thesis on preparation. The poster I now present illustrates the presence of the said parallels: decorated hearths in Iron Age settlements, a theme which has been occasionally studied, although never as a main focus of a dissertation. Our work aims to provide an up-to-date summary of the currently known examples of decorated hearths found in-situ at the sites of Santo Estevão, (Ponte de Lima),; Castro Máximo, (Braga),; Citânia de Briteiros, (Guimarães); Cividade de Terroso, (Póvoa de Varzim); São Paio, (Vila do Conde); Castro de Romariz, (Santa Maria da Feira).

All the archaeological evidence was collected from excavation field reports and correlated publications. These evidences were examined and presented in articulation with typological characteristics and decorative themes.

The chronological frameworks are indicated according to author's view. In addition, I also advance my own proposals, constructed on the basis of the articulation of all the data available.

- **16861 | SPRR1A EXPRESSION IN EXPERIMENTAL OSTEOARTHRITIS. IS THERE A ROLE IN PAIN?**

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Chronic unbearable pain associated with osteoarthritis (OA) is a major health problem and remains the main clinical concern in OA treatment. Our previous studies showed an increased expression of neuronal damage markers and GAP-43, a regeneration associated-gene (RAG), in primary afferent neurons (PAN) of the ipsilateral dorsal root ganglia (DRG) in rats with OA. Thus, we investigated if other RAGs are expressed in PANs of rats with collagenase-induced OA (OA-Coll) in the knee. One molecular candidate was small proline rich protein 1A (SPRR1A), a RAG highly expressed in PANs after peripheral nerve injury. RT-qPCR and Western Blot analysis showed increased SPRR1A expression in ipsilateral PANs of OA-Coll animals when compared to controls. To understand the role of SPRR1A in the nociceptive behavior of OA animals, we injected a viral vector (AAV2/5-SPRR1A) in L4-L5 ipsilateral DRG, at 14 days after OA induction, to overexpress SPRR1A in PANs of OA-Coll rats. Control OA-Coll rats received no intraganglionic (i.g.) injection. RT-qPCR confirmed SPRR1A overexpression in Coll+SPRR1A rats and weekly assessment of the nociceptive behavior showed an attenuation of movement- and loading-induced nociceptive behaviors (Knee-Bend and CatWalk tests). To show the effect was not model-specific, similar studies were done in rats with monoiodoacetate (MIA)-induced OA. We observed an attenuation of mechanical hypersensitivity (von-Frey test) throughout time but no changes in movement-induced allodynia (Knee-Bend) in OA-MIA rats with i.g. injection of AAV2/5-SPRR1A, when compared with OA-MIA without i.g. injection. OA-MIA+SPRR1A rats showed increased movement-and loading-induced nociceptive behavior (CatWalk test), which was accompanied by lower motor coordination in the Rotarod test. RT-qPCR confirmed the SPRR1A increase in DRG of OA-MIA+SPRR1A rats. Data suggest SPRR1A is implicated in OA pain events at the DRG level. However, the underlying molecular mechanisms are still unclear.

- **16863 | Impact Assessment of Lean Approach in Hospital Discharge Planning**

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Introduction:

Health care units seek to reduce costs, although still improving patient safety levels. One of the major managing processes that highly impacts on organizational efficiency is the discharge planning, which assumes a central role for an effective management of hospital beds capacity for inpatient admission.

The Lean Six Sigma methodology has been shown to reduce the time it takes to plan the discharge process in other hospitals, therefore increasing the patients' satisfaction and the whole quality of hospital services.

Methods:

The aim of this study was to evaluate the impact of the restructuring process of the discharge planning within a private hospital, by performing Lean Six Sigma methodology and comparing specific indicators, such as average time for billing, percentage of issued invoices, average length of hospital stay, rehospitalisation rate, percentage of meals returned by early discharge and patient satisfaction, before and after intervention.

In recognition of the major significance of this process, the hospital deployed a team to identify main problems and propose definite improvements. The project was implemented using a quantitative and qualitative approach, the DMAIC (Define, Measure, Analyse, Improve, Control), through which the data were analysed, solutions have been identified and an improved process was developed. After evaluation of the process and the survey of opportunities, actions have been implemented with the goal of a continuous improvement process throughout.

Results:

Six months following Lean Six Sigma methodology intervention, indicators revealed a 36,6% reduction in cycle time ($p = 0.003$), it increased billing by 6% on the day, reduced food waste by 0,2%, and, importantly, increased patient satisfaction.

Conclusion:

In conclusion, the Lean Six Sigma is a method with significant positive outcomes and should be taken into consideration by other public or private hospitals in order to improve hospital discharge.

- 16874 | A contribution to a better understanding of EHD thrusters in order to optimize their construction and adequate operation conditions

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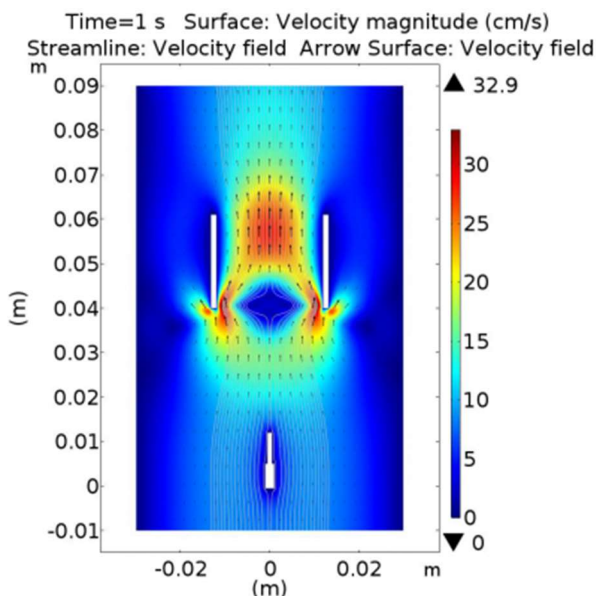
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Electrically powered spacecraft propulsion systems make use of electrical energy to accelerate a propellant by different electrical and/or magnetic means. An Electrohydrodynamic (EHD) thruster is an electrostatic device, an ion engine. The underlying theory of Electrohydrodynamic (EHD) phenomena relies on charged species drift due to an applied electric field, and the resulting momentum transfer through collisions with the surrounding neutral species. Thus, a force, called the thrust, is exerted on a space vehicle through the ejection of, usually, a working gas (air, xenon, argon, nitrogen, or others) generally containing high kinetic energy. The goal of this project is to analyse, and improve, the working mechanisms of EHD thrusters, using noble gas propellants, such as Argon (Ar) and Xenon (Xe). In particular, the effect of a volume force, included in the Navier-Stokes equation, is investigated, since it was not obvious why, in the technical literature, two different forms of expressions are used: $\vec{F} = \rho_c \vec{E}$, where \vec{F} is the volume force, ρ_c is the net volume charge density and \vec{E} is the electric field; or instead $\vec{F} = \rho_i \vec{E}$, with ρ_i the ion volume charge density. The response of the thrust to the change of the applied voltage, and the curve V-T, shows that there is no significant change when using one or the other.

In Argon, a previous study at a pressure of 10 Torr and an applied voltage of 3000 volt gave to the thrust 4,1 nN and a thrust-to-power ratio of 18 $\mu\text{N/W}$. However, in the present study, the thrust increased up to 450 nN, reaching an impressive 100x increase, and a thrust-to-power ratio of 71 $\mu\text{N/W}$, a more modest increase of 4x. To obtain this result, the main input voltage was increased 7x (to 20 kV) and the ballast resistor was increased by 10x, maintaining the same current so that the working regime remained a corona discharge.



Velocidade do Plasma

- 16879 | Characterization of microbial communities associated with lost fishing nets

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Plastic Pollution is a subject of growing concern, especially regarding marine litter, where plastic can represent up to 90% of the total debris. The negative effects of macro and microplastics on animal life is still lacking further research, namely the associated microbial communities. In fact, little is known about its structure and function, and there are indications that the microbial communities associated with macro- and microplastics differ from those in the surrounding water and sediment, not only in structure but also in metabolic pathways.

This work was developed in the line of the Net Tag project which aims to understand the environmental harmfulness of lost fishing gear, with a special focus on the microbial communities associated with lost gear that have not been separately studied. The aim of this study is to characterize the microbial community associated with lost fishing nets in the NW coast of Portugal and understand if they might be a transportation vector of biological pollutants such as opportunistic pathogens and how pollutant degrading bacteria are represented in this communities. To reach this purpose lost fishing nets were sampled from two sites, followed by an optimization of microbial DNA extraction using different commercial kits. The DNA was then quantified and the region V6 to V8 from the 16s gene was amplified with the primers 969F and 1406R. Finally, the samples will be sent to Next Generation Sequencing and the results will be analysed to characterize the microbial community.

In the presentation the results obtained until that moment will be shared.

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- 16881 | Black corn (*Zea mays*) as an adjunct with potential to improve beer bioactivity

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Nowadays, consumer standards regarding food and beverages quality and the demand for new and varied products is constantly increasing. As a response to this ever-changing reality, profitable niches are targeted when developing new beer products with remarkable examples such as alcohol-free, gluten-free or enriched beers. Enriched beers are usually supplemented with components that positively affect the consumer health status, thus increasing the attractiveness and bioactivity of the products.

Different unmalted cereals such as corn, rice or sorghum are added to the traditional beer raw materials (water, barley malt, hops and yeast). These adjuncts can significantly affect the beer total cereal content, contributing to more than 30% of the cereals bill. Due to this reality, using a cereal adjunct to improve beer bioactivity without significantly altering the technological process seems viable. Keeping that in mind and aiming to prize underutilized plant varieties, regional black corn (*Zea mays*) was selected, planted and harvested in the Portuguese Bank of Plant Germplasm (BPGV).

In this preliminary study, the anthocyanin content of the selected black corn variety was evaluated and its potential to be used as an adjunct to improve beer bioactivity was discussed. Moreover, considering the many different techniques and styles used to incorporate beneficial compounds in the final product, a beer recipe was selected as well as the strategy to incorporate the corn during the brewing process, targeting a low-alcohol, attractive and enriched final product.

- 16883 | Does participation in a multicomponent exercise training program provide added cardiometabolic risk factors following bariatric surgery compared to surgery alone?

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Purpose: Bariatric surgery (BS) and exercise have both beneficial cardiometabolic effects, however, it remains undetermined if exercise post-BS is able to achieve additional benefits. Our aim was to investigate the additive effects of exercise and BS on cardiometabolic health.

Methods: Sixty-two patients with obesity (43.8 ± 10.6 years; 45.2 ± 5.6 Kg.m⁻²; 86% female) were recruited and one-month after BS (68% RYGB; 32% Sleeve) were randomized to control (CON, n=23; standard medical care) or exercise groups (EX, n=39; 11-months multicomponent exercise, 75min/day; 3day/week, plus standard medical care). Hemogram and biochemistry (liver enzymes, total cholesterol, LDL, HDL, triglycerides, fasting glucose, HbA1c, insulin, C-peptide, uric acid and hs-CRP) were analyzed before, 6 and 12-months after BS and clinical assessment (weight, blood pressure, waist circumference and resting heart rate) was performed at 1, 6 and 12-months after surgery. Intention-to-treat analysis was performed.

Results: 12-months after BS both groups decreased significantly body weight (CON -29%, EX -30%), waist circumference (CON -21%, EX -23%), insulin (CON -68%, EX -80%), c-peptide (CON -53%, EX -52%), glucose (CON -25%, EX -19%), HbA1c (CON -15%, EX -9%), triglycerides (CON -38%, EX -34%), uric acid (CON -29%, EX -13%) and leucocyte count (CON 22%, EX 20%). Significant decreases in total cholesterol (-24%), LDL (-32%) diastolic blood pressure (-12%) and Framingham score for CHD (-84%) were only observed in CON. Significant decreases in hs-CRP were only identified in EX (-83%). Two-way ANOVA showed no significant treatment*time interaction effect for any of the variables.

Conclusion: Overall, a multicomponent exercise program was unable to provide additional improvements in cardiometabolic health compared with BS alone.

- **16884 | Evaluation of sulphites influence on the carbonyl compounds content of wines by GDME-HPLC-UV**

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Sulphites are a class of widespread food additives found in many food products, acting as an antioxidant and antimicrobial agent. In wine, the addition of sulphites during the winemaking process is a common procedure, in order to stabilize the quality of the final product. Typically, wines have a pH between 3 and 4, so when sulphites are added, the prominent form is the bisulphite ion (HSO_3^-). The ability of sulphites to bind to undesirable wine compounds, forming adducts, configures an important role for the regulation of the wine bouquet.

Gas-diffusion microextraction (GDME) is a sample preparation technique based on the extraction of volatile compounds from the sample. This technique extracts the volatile compounds from the sample through a gas-permeable membrane into a liquid acceptor phase. GDME can be combined with a derivatizing reagent to improve separation and/or detection of the analytes. The use of a derivatizing reagent in the acceptor phase enhances the extraction selectivity and the enrichment factors.

In this work, GDME combined with HPLC-UV was used to evaluate the effect of breaking the adduct between sulphites and different carbonyl compounds of wine, making possible to determine their free, bound and total contents. For the derivatization reaction, the 2,4-dinitrophenylhydrazine reagent was used. Different global and individual effects were studied and evaluated in model wine solutions and in wine samples, such as the addition of increasing amounts of sulphites, the stability of the adduct formed and the optimum pH to break the adduct. Finally, the free, bound and total contents of carbonyl compounds was determined in different red, white and rosé samples.

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- 16886 | Does Plant Protection Products application affects the retention function of vineyard soils?

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Soil is a unique environment that has many important functions such as mechanical support for plants, habitat provision for the soil organisms, nutrient cycling, water and organic matter storage, water filtering by contaminant retention. However, these functions can be affected using plant protection products (PPPs). These products improve crop productivity, protect crop losses and combat disease vectors, but, on the other hand, they can lead to adverse effects in the environment, and particularly to adjacent aquatic systems through leaching or surface runoffs. This results on contamination of water, affecting aquatic plants, decreasing dissolved oxygen concentration in water and causing behavioral effects and physiological changes in fish. These problems are of special concern in areas such as the Douro Demarcated Region characterized by vines implemented on traditional steep slopes which contributes to the dispersion of contaminants. The aim of this work is to understand if vineyard soils can perform their retention function (of PPPs) during a one year monitoring period.

This study took place in two vineyards in the Douro Demarcated Region that were under integrated protection mode (IPM). About six samples of soil were collected in each vineyard throughout the year of 2018: during herbicide application (February and April), during fungicide application (June) and before the application of herbicides for the new agricultural year (January 2019). In the context of this work, some ecotoxicological assays with aquatic organisms were performed such as bioluminescence assay with *Allivibrio fischeri* (Microtox) and growth inhibition assay with *Lemna minor* and *Raphidocelis subcapitata*. Some differences were observed for the different periods studied, and adverse effects were recorded mainly in the sampling period when PPPs were applied.

- **16887 | Copper toxicity in the context of organic viticulture**

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As the demand of more sustainable agricultural practices becomes more relevant than ever, the implementation of organic farming systems is actively growing. This production system focuses on managing crops with the least disruption possible of the environment, aiming to preserve biodiversity and the overall complexity of the ecosystem. However, despite the prohibition of synthetic organic pesticides, there's still a high dependence of other pesticides, and this is particularly true for organic viticulture.

Copper is extensively used as a fungicide in organic vineyards, and at the moment these represent the land-use with the highest soil Cu concentration in European soils. Being a persistent metal in soils, together with its toxicological potential, Cu poses a risk to terrestrial organisms, but also to aquatic communities, as it leaches to water masses. The runoff of Cu is of special concern in vineyards established in steep slopes and terraces, such as in the Douro Demarcated Region, as these areas are more sensitive to erosion processes. Moreover, due to the acidic nature of these soils, the migration of Cu through soil profile is likely to occur.

In order to understand the impacts of the use of Cu-based fungicides in the ecosystem, a 15 years old vineyard under organic management in the Douro Demarcated Region was selected, and soil samples were collected in two different periods: one during the application of fungicides, and the other six months after. Samples were used to carry a battery of ecotoxicological assays to both terrestrial and aquatic organisms, evaluating the level of disturbance of direct exposure to these soils and to their leachates, respectively. Preliminary results showed no toxicity in both sampling periods, for any of the endpoints evaluated, which might indicate a sustainable use of Cu fungicides in this vineyard. Nevertheless, it should be noted that, due to the young age of the vines, low levels of Cu accumulation in soils are expected.

- **16890 | Automatic fluorometric lactate determination in human plasma samples**

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Lactate is usually present in human blood at very low concentrations and its production is under hypoxic conditions. However, lactate is considered a signalling molecule promoting specific immune inflammatory responses since its levels increase according to the grade of inflammation, and their concentrations in blood and healthy tissues range between 1.5 - 3 mM, under physiological conditions.

In this experimental work, an automatic system based on sequential injection analysis (SIA) was developed to determine the lactate concentrations in human samples. The reaction is based on the conversion of lactate to pyruvate by lactate dehydrogenase (LDH) in the presence of nicotinamide adenine dinucleotide (NAD⁺) that is converted to nicotinamide adenine dinucleotide reduced (NADH), a fluorescent compound.

SIA technique presents several advantages, such as full automation for fast sample handling, improve accuracy and precision results and decrease the reagent consumption and waste production. Moreover, SIA system allows different methodologies to be implemented without manifold modifications. In literature, there are few studies that report the use of these systems in the determination of human samples.

The methodology developed presents detection and quantification limits of 0.193 mM and 0.642 mM, respectively. These limit values allow accurate and reliable quantifications of lactate in human plasma samples. This work confirmed the potential of the SIA system as an excellent analytical tool for the automatic determination of lactate levels.

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- **16891 | Planctonic communities of Sado's estuary: an ecological evaluation**

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Sado estuary has been subject of several studies to assess the impact of anthropogenic pressures, eutrophication processes on the quality of the ecosystem, and the sustainable development of aquaculture. In this context, the Aquasado project aims to study the water quality of Sado's estuary, judging the system's carrying capacity in order to develop sustainable aquaculture. The present work aims to evaluate the plankton communities of Sado's estuary (phytoplankton-biomass and composition, zooplankton and ichthyofauna-diversity and abundance). Additionally, water physical and chemical characterization was made, in order to assess the variation of abiotic factors in the distribution and occurrence of planktonic communities in the estuary. The most abundant phytoplanktonic groups observed were diatoms, dinoflagellates and cyanobacteria. Regarding chlorophyll concentration in water samples, a decrease from September (4mg/m³) to October (2mg/m³) was recorded. Concerning zooplankton, the main groups recorded were copepod and appendicular, and no larvae of ichthyofauna, has been observed. The results of physical and chemical parameters measured in situ revealed that dissolved oxygen concentration (8mg/L) and pH values (8) remained constant between September to October, while temperature decreased. Salinity decreased upstream to downstream (39-37) in September, due to evapotranspiration rates higher than freshwater ingoing the system. In October, the salinity values increased upstream to downstream (36-37). The results obtained for nutrients analyzed showed a decrease in nitrite, ammonia and phosphorus concentration (14-10 µgN/L; 60-20 µgN/L; 34-32µgP/L) and increased nitrate and silica concentration (57-82 µgN/L; 0.6-1.1 mgSi/L) from September to October. Considering the two sampling campaigns, the here-presented results for physical and chemical parameters showed that the reference limits proposed by the WFD for this type of water bodies were not exceeded.

- **16892 | Study of the interaction of a quinacrine analogue with double stranded DNA**

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Nucleic acids play significant roles in several biological processes. Since many anticancer treatments include a compound that binds to or modifies the DNA molecule, the study of DNA-binding compounds may have an important clinical significance. In order to develop effective and potentially safe anticancer agents, several studies have been carried out for quinacrine analogues, especially with an aliphatic tail in positions N4 or N9. This tail can have impact on DNA binding, so studies with different chains are needed to evaluate its influence.

In this communication, we report the study of the interaction of a quinacrine analogue (4A6C) with double stranded DNA, by UV-vis spectroscopy, viscosimetry and fluorescence spectroscopy. Absorption spectra and UV melting curves were recorded for solutions with constant DNA concentration and different concentrations of 4A6C. DNA melting experiments were carried out by recording the change in absorbance at 260 nm for DNA in the absence and presence of 4A6C. The denaturation temperature and the hyperchromicity were calculated for each concentration of 4A6C. Viscosimetry experiments were carried out for solutions with constant DNA concentration and different concentrations of 4A6C.

The results obtained by UV-vis spectroscopy and viscosimetry will be presented in order to assess the binding affinity of the compound to DNA.

Thanks are due to Fundação para a Ciência e Tecnologia (FCT, Portugal) for funding research units, CIQ-UP (ref. UID/QUI/00081/2013) and LAQV-REQUIMTE (ref. UID/MULTI/50006/2019), and funding grant PTDC/BTM-SAL/29786/2017, and to FEDER (COMPETE 2020) for funding Project POCI-01-0145-FEDER-006980.

- **16893 | Effect on DNA structure and stability upon intercalation of a quinacrine analogue**

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Acridines and their derivatives are amongst the most studied chemotherapeutic compounds, because of their numerous biological properties. Recent studies have focused mainly on the synthesis of acridine derivatives, such as quinacrine analogues, for the treatment of malaria and cancer. One of the mechanisms of action underlying the antimalarial and anticancer activities of quinacrine has been attributed to its interaction with DNA.

This work aims to study the interaction of a quinacrine analogue (4A4C) with double stranded DNA, using UV-vis spectroscopy, including UV melting experiments, viscosity measurements and fluorescence spectroscopy.

Absorption spectra were recorded for solutions with constant DNA concentration and different concentrations of 4A4C. DNA melting experiments were carried out by recording absorbance versus temperature profiles at 260 nm. DNA denaturation temperature, as well as hyperchromicity, in each solution, were obtained from the curves of fraction of melted base pairs as a function of temperature. The binding constant of the DNA-4A4C complex, at 293 K, was also calculated from UV spectra. Viscosimetry experiments were carried out for DNA solutions with different concentrations of 4A4C, in order to detect the stretching of the DNA helix resulting from binding.

The results obtained by all the techniques evidence a strong binding affinity of 4A4C with DNA, affecting the structure and stability of the double helix, and suggest the binding of 4A4C to DNA mainly by intercalation. The results are further indicative of a mixed mode of 4A4C binding to DNA, as observed for other quinacrine analogues, depending on the relative concentrations of 4A4C and DNA.

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- **16894 | Enantioseparation of a series of cathinone derivatives by liquid chromatography using chiral stationary phases**

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Cathinone derivatives are very interesting bioactive compounds being one of the main constituents of "legal highs" [1]. Their consumption has serious health concerns; nevertheless, new cathinones continue to be synthesized and consumed [2]. All the synthetic cathinones are chiral and, consequently, enantioselectivity can be found in their biological and toxicological activities. Only a handful of studies concerning their potential enantioselectivity on bioactivity/toxicity has been reported to date [3,4].

Herein, we described the enantiomeric resolution of fifteen synthetic cathinones by liquid chromatography (LC) using two chiral stationary phases (CSPs) consisted on polysaccharide derivatives: Chiralpak AS-H® and CSP based on amylose tris-3,5-dimethylphenylcarbamate. Enantioseparation was observed for eleven analytes under normal phase elution conditions using mixtures of hexane, ethanol or 2-propanol and triethylamine as mobile phases. The cathinone derivatives comprising a secondary amine (pentedrone, methylone, buphedrone, 4-MEC, 3-CMC, ethcathinone, 4-CEC and pentylone) were enantioseparated on Chiralpak AS-H®; while the enantiomers of the ones comprising a tertiary amine (bk-DMBDB, 4-Chloro- α -PVP and MDPV) were separated on the CSP based on amylose tris-3,5-dimethylphenylcarbamate.

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- 16895 | Construction of a double-reporter strain to assist drug screening against mycobacteria

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Non-tuberculous mycobacteria (NTM), like *M. abscessus* or *M. avium*, infect mainly patients with a compromised immune system, such as those who suffer from cystic fibrosis or are co-infected with HIV. Mycobacteria infect the lungs but can also disseminate to the skin and, in the case of *M. abscessus*, cross the blood-brain barrier, causing meningoencephalitis. The conventional methods for testing new anti-mycobacterial drugs, either *in vitro* or *in vivo*, are costly and time-consuming. Recombinant mycobacteria expressing fluorescent and bioluminescent genes can be used as markers for bacterial load and for following the progress of the infection live on animals, in a low-cost, non-invasive way. Our objective was to transfect NTM with a double-reporter gene construct, containing a green fluorescent reporter gene (mClover) along with an improved luciferase reporter gene. The combination of both fluorescence and bioluminescence imaging offers advantages for both *in vivo* and cellular level detection. Single cell imaging by fluorescence microscopy allows the visualization of the mycobacteria inside stained J774A.1 macrophage-like monocytes, by excitation of the mClover fluorophore. *In vivo* bioluminescent imaging (BLI) is a non-invasive technique that permits to follow the progression of a mycobacterial infection occurring in a living subject, as is the case of mice. By injecting D-luciferin in the animal, the luciferase produced by the mycobacteria converts it to oxyluciferin, initially in an intermediate excited state, that when returns to its ground state releases energy in the form of light. In the future, we aim to characterize the novel reporter strain in order to use it to efficiently screen new anti-mycobacterial drugs.

- **16896 | Biotoxins affecting bivalves of commercial interest in Portugal**

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Bivalves are soft-bodied animals two shells or valves, which serve as an exoskeleton and promote an airtight closure of the animal's internal organs, protecting it from external threats. They are found in both marine and freshwater environments, live buried in the sediment or fixed in the substrate occupying intertidal regions. From an ecological point of view, bivalves are extremely important because they feed on phytoplankton in suspension using siphons through which they carry water that passes through their gills and thus retain food particles. They have also been highly appreciated in human food throughout the world. In Portugal there is also an old tradition of shellfish consumption and these largely account for the collection of the industry. national fishing. However, the production of bivalves in the country is banned annually by the occurrence of biotoxins such as the Diarrhetic shellfish poisoning (DSP) that cause economic damage and risks to human health. Given their importance and the risks they pose to the shellfish consuming population, the main objective of this paper is to list the species of bivalve of greatest commercial interest in Portugal and their vulnerability to different biotoxins by analyzing scientific and technical reports. To fulfil this task, a literature review was conducted in scientific journals, as well as careful analysis of the information provided on the Instituto Português do Mar e da Atmosfera (IPMA) on the variation of biotoxin levels throughout the months of the year throughout the Portuguese coast. The result revealed that mussels, shellfish, cockles, clams and razor clams are the bivalves that accumulate the highest concentrations of DSPs toxins. Once intoxicated, DSPs and its analogues can be retained by bivalves for a long period. Moreover, species as clams and mussels are among of the greatest commercial interest, thus the importance of monitorization, both for industry and for people's health.

- **16898 | Maternal ageing and placenta lipid metabolism: implications on foetal overgrowth**

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Maternal ageing is characterized by a decrement of natural fecundity and associates with enhanced risk for pregnancy disorders and perinatal, as well as longer-term, new-born complications. This condition cannot be ignored, as the average age of women at first child birth is increasing worldwide. Recently, using a rodent model of reproductive ageing, we have demonstrated that advanced age and dietary supplementation with TEMPOL (a superoxide dismutase mimetic) increases foetal weight implying a role for utero-placental redox balance environment in litter features. Understanding the mechanisms that mediate the effect of age and TEMPOL on foetal weight gain constitutes the main goal of this project.

Foetal placenta tissue collected from young and reproductively aged mice, treated with TEMPOL or vehicle, was used to evaluate the mRNA expression levels of Lpl and Fabp4, both involved in lipid metabolism. Inflammatory profile was also evaluated by qPCR analysis of Ccl-2, Ccl-5 and Tgfb1. Hprt and Gusb were used as reference genes as actin showed variance between groups. Placenta lipid metabolism was affected by advanced maternal age as shown by increased levels of Lpl and Fabp4 expression. The anti-oxidant TEMPOL treatment was able to revert the age-related increase in Lpl expression but not in Fabp4. Despite of placenta being a foetal tissue, it was shown to be susceptible to a maternal age-related inflammatory burst as demonstrated by increased levels of the cytokines Ccl-2, Ccl-5 and Tgfb1, with TEMPOL having a beneficial effect. These results show an association between maternal age, inflammation and lipid metabolism. The mechanisms by which TEMPOL increases foetal weight awaits for further elucidations.

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- 16900 | Title: A deep look into the cores of stars with asteroseismology: extracting precise information from the frequency ratios.

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Nearly all the physical processes that determine the structure and evolution of stars occur in their interiors. However, the extent of chemically mixed regions associated to stellar convective cores is notoriously uncertain. Asteroseismology has revolutionized the study of solar-type stars through the measurement and modelling of their resonant modes of oscillation. The precise characterization of these oscillations in main-sequence stars makes the measurement of the extent of convective cores possible.

We compute ratios of combinations of mode frequencies built with $l = 0$ and $l = 1$ modes, which in turn can be used to calculate stellar parameters. We will compare the uncertainties associated with the parameters of the polynomial fit of the ratios obtained through Monte Carlo simulations and using the covariance matrix, since they will limit the precision with which stellar parameters can be estimated. It was used the Kepler data for stars KIC8379927 and KIC 12069424 (16 Cyg A).

- **16901 | Dissecting *Prrxl1* transcriptional program in the developing dorsal spinal cord**

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Spinal dorsal horn neurons receive nociceptive sensory input from dorsal root ganglion (DRG) neurons. Along embryonic development, the interplay between extracellular patterning signals and cell-intrinsic genetic programmes controlled by transcription factors give rise to the neuronal diversity and proper connectivity.

Paired related homeobox protein-like 1 (*Prrxl1*) is a homeodomain transcription factor expressed in both DRG and their putative central targets in the spinal dorsal horn, suggesting a functional role in establishing connectivity between first and second order nociceptive neurons. Accordingly, studies on *Prrxl1* null mouse embryos revealed that *Prrxl1* is necessary for migration, differentiation and maintenance of dorsal horn neurons.

To unravel the transcriptional network downstream of *Prrxl1* in the developing dorsal spinal cord, a genome-wide study combining chromatin immunoprecipitation assays followed by next generation sequencing (ChIP-Seq) with microarray expression profiling in *Prrxl1* null and control mouse embryos at E14.5 was performed. By integrating ChIP-Seq and microarray datasets, we generated a comprehensive list of putative *Prrxl1* transcriptional target genes. Gene ontology analysis of target genes showed that the most enriched functional categories are associated with late aspects of neuronal development, which is in line with the phenotype observed in *Prrxl1* null mice.

Hereafter, we selected a subset of 17 *Prrxl1* direct target genes based on their functions related to late neuronal maturation and synaptic transmission. Currently, we are validating the deregulated expression of this subset of target genes in *Prrxl1* null embryos through *in-situ* hybridization and RT-qPCR. Gathering expression with future *Prrxl1* functional studies, we hope to provide the molecular framework underlying *Prrxl1* cellular functions in the development of spinal dorsal horn.

- 16903 | Exposure of *Mytilus galloprovincialis* to diarrhetic shellfish poisoning toxin: food safety implications

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Toxins produced by microalgae are yearly responsible for approximately 60000 human foodborne outbreaks. Shellfish toxins have a negative economic impact on recreational activities, tourism and shellfish industry. Dinoflagellates such as *Dynophysis* and *Prorocentrum lima* are considered a primary producer of diarrhetic shellfish toxins, mainly Okadaic Acid (OA) and Dinophysistoxins (DTXs), which can be accumulated in the tissues of bivalves. Although depuration of bivalves is performed at industrial level, the bioaccumulation of OA and DTXs could be fairly large, making them unsafe for human consumption for a long period. In this study the dynamic of OA and DTXs in the mussel *Mytilus galloprovincialis* was monitored for the accumulation and depuration processes. Around 330 specimens were collected in the depuration plant and then randomly distributed through the six aquaria (25 L) at the facilities of CIIMAR Bioterium. Three aquaria were fed with 5.0×10^7 cells/L of non-toxic microalgae (mixture of *Isochrysis* and *Tetraselmis*), whilst the other three aquaria were exposed twice a day to *P. lima*, with a cell density of 2.6×10^8 cells/L, for 5 days. After the accumulation period all mussels were submitted to the depuration process for 15 days. The quantification of the toxins in gills and digestive glands of mussels submitted to the accumulation and depuration processes was performed by LC-MS. The results showed that accumulation only occurred in the digestive gland with concentrations of 2144.9 to 12433.5 $\mu\text{g/kg}$ and 699.5 to 4546.6 $\mu\text{g/kg}$ for OA and DTX-1, respectively. Initially, it was detected a marked increasing of both OA and DTX-1 toxins, being OA accumulated in greater quantity. The accumulation process occurred in a faster way compared to the depuration, which required considerable time. These results suggest that the routine procedures applied in industrial depuration could be inefficient for purifying bivalves contaminated with high concentrations of OA and DTX-1.

- **16907 | Soup waste in school canteens: a problem to avoid**

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Introduction: Food waste is an actual problem in school canteens. In a sustainable logic, it's essential to reduce this situation. Vegetable soup is an important component on healthy food recommendation, so it is necessary to avoid its waste.

Goal: To evaluate soup food waste, in the lunch meal, at two contract catering units of the public-school sector and associate with self-reported food satisfaction aspects reported by the students.

Method: Observational study with transversal design. The soup food waste evaluation of the meals served to students was proceeded from preschool to high school, during 10 days. In order to quantify the leftovers and soup plate waste of 2686 meals, the physical method of weight was used. To evaluate the satisfaction with the lunch meal, a questionnaire was elaborated and apply directly on the students from the 5th to the 12th grade (n=91).

Results: During the evaluation period, a ratio of 28% of soup food waste of 2686 soups served was verified, showing an index of leftovers and soup plate waste of 12% and 18%, respectively. In both contract catering units, a lower index of soup plate waste was verified in cream soup. There has been found differences with statistical significance when food waste was related with certain aspects evaluated in the satisfaction questionnaire, such as: soup food waste was bigger as higher it was the noise in the canteen and soup food waste was higher as lower it was the meal temperature.

Conclusion: The data found reveals values of food waste higher that the ones recommended by the scientific literature, justifying an urgent need of reduction, The noise in the school canteen and the meal temperature seems to be associated with the increase of soup food waste.

Key-words: food waste; soup; physical method of weight; satisfaction; school lunch.

- **16908 | Recent advances on Persistent Pulmonary Hypertension of the Newborn: pathogenic mechanisms and novel therapeutic approaches**

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Persistent pulmonary hypertension of the newborn (PPHN) is a syndrome characterized by sustained elevation of pulmonary vascular resistance, preventing the increase in pulmonary blood flow, essential for postnatal gas-exchange and survival of the newborn. The affected neonates fail to establish adequate oxygenation of blood, precipitating severe respiratory distress, hypoxemia and eventually death.

Many research has been done around this subject, although with little impact on treatment and mortality. This review summarizes the current knowledge on PPHN, including its etiological mechanisms and current therapeutic approaches, as well as the most recent discoveries of cellular pathways involved in its pathogenesis, and novel therapeutic approaches that arose from research in humans and animal models. Besides NO-GMP, prostaglandins and endothelin-1 signaling pathways, we also summarize the role of more recently unveiled cellular mechanisms on lung maturation, angiogenesis and smooth muscle cell function, such as Rho-kinase, Nogo-B Receptor and reactive oxygen species.

Inhaled nitric oxide is the only approved pulmonary vasodilator for PPHN, but 30% of infants fail to respond to this treatment. So, further treatment options are reviewed, such as sildenafil, milrinone, prostaglandin analogues and bosentan. Besides, we analyze recent results in animal PPHN models, namely with L-citrulline, Rho-kinase inhibitors, recombinant human superoxide dismutase and PPAR- agonists.

Lastly, we show the impact of maternal use of some drugs, such as SSRIs and NSAIDs, as well as the mode of delivery, maternal race, smoking, overweight and diabetes, fetal gender and gestational age at birth, on the increased occurrence of PPHN. This highlights the exposures that must be avoided, namely during pregnancy, to prevent PPHN.

This review intends to be a guide to stay abreast of current knowledge on etiology, pathogenesis and of new therapeutic options and preventive measures for PPHN.

- 16909 | Characterisation of *Prrxl1* S119A phosphodeficient knock-in mouse: impact on the development of nociceptive neurons

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Prrxl1 is a homeodomain transcription factor critical for the proper development of the Spinal Cord/DRG nociceptive circuitry. *Prrxl1*-null mice embryos presented loss of most superficial dorsal glutamatergic neurons along with spatiotemporal defects in primary afferent projections to the spinal cord and decreased sensitivity to noxious stimuli. Phosphorylation acts as molecular switches, regulating the affinity and selectivity towards certain protein-DNA interactions, thus altering protein function. Since *Prrxl1* presents multiple phosphorylation states that evolve and change along spinal cord development, this post-translational modification might contribute to the role played by *Prrxl1* during embryonic development. From all identified *Prrxl1* phosphosites, phosphorylation impairment at S119 caused the most drastic effects in terms of loss of transcriptional activity and conformational changes in cell culture. To further characterise and understand the role of S119 phosphorylation, a S119A phosphodeficient mutant mouse was then generated by using CRISPR-Cas9 genetic editing technology. Putative morphological abnormalities in spinal cord development and changes in the *Prrxl1* genetic program are assessed in order to unveil the functional impact of pS119 on the establishment of the nociceptive circuitry.

- **16915 | Engagement and anxiety among nurses**

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Introduction/aims: Currently nursing is a high demanding professional occupation, eliciting job-related anxiety (Alhakami & Baker, 2018). However, on stressful jobs, engagement and emotional intelligence are important protectors (Pérez-Fuentes et al., 2018), especially reducing the possibility of chronic job stress becoming burnout (Saito et al., 2018). This study aims to identify anxiety and engagement levels among Portuguese nurses and to analyze their correlations.

Method: Within the INT-SO project (collaboration between FPCEUP and ESEP) we applied to 326 Portuguese nurses the Utrecht Work Engagement Scale (Schaufeli & Bakker, 2003) and the State-Trait Anxiety Inventory (Spielberg, 1983) and a sociodemographic/occupational questionnaire, after formal permission of public hospitals from the North of Portugal. Nurses participated voluntarily and anonymously.

Results and Discussion: Moderate values of Engagement and low values of Trait and State Anxiety were found. Engagement is negatively correlated with Trait and State Anxiety, which explained 13% of Engagement, compared to 6% of labor variables. Job experience is negatively correlated with Trait Anxiety and comparative analysis revealed that nurses working on Health Centers are more engaged than those working on Hospitals, as well those working by fixed shifts.

Conclusions: These results highlight that the fulfillment of psychological needs at the workplace are positively linked to job vigor and negatively to anxiety, since highly engaged workers are better able to satisfy their basic psychological needs through their work activities than employees low in engagement or high in burnout (Bakker & Oerlemans, 2016). Moreover, results showed the association of anxiety with low engagement, which can predispose to experience more job stress and burnout (Oliveira & Pereira, 2012, Trifiletti et al., 2017).

Keywords: Anxiety; Engagement; Correlational Study; Nurses.

- 16916 | Application of a mathematical model to simulate a fine grinding closed circuit.

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The comminution stage is a fundamental step in the mineral processing diagram, promoting the liberation of the valuable minerals by size reduction. Depending on the ore texture, different reduction ratios must be applied to achieve the most desired mineral liberation, which allows for the success of the mineral separation process. One of the most applied comminution equipment is the ball/rod mill, which allows for high particle reduction ratios. It is well established that high mineral liberation degrees will conduct to high-grade concentrates. However, it would require longer grinding times, increasing the overall cost of the process.

According to this, it is fundamental to look for appropriated tools that can be applied to predict and improve the performance of a grinding mill. In this study, a mathematical model was applied to acquire the parameters that can describe a specific grinding process, which was furtherly applied to simulate different experimental scenarios. The model parameters were fitted using real data from a fine grinding circuit, namely the feed and the grinding product particle size distributions. The applied mathematical model is based on the general equation of the comminution, allowing for the computation of the instantaneous modification of the particle size distribution of the mill product at a certain time. The calculation of the particles selection function (K) and the breakage function (B) is fundamental for the implementation of this model. Two different approaches, analytic and numeric (Euler method) were compared. The development of a phenomenological model for the grinding stage is a powerful tool for any mineral processing Engineer once it allows for the prediction of the mill product. The main output of this work is a simulation tool that, after fitting the model parameters that defines the selection function (K) and breakage function (B) of studied grinding circuit, allowed for the assessment of different grinding conditions.

$$\frac{df_i(t)}{dt} = -K_i \cdot f_i(t) + \sum_{j=1}^{i-1} K_j \cdot f_j(t) \cdot B_{i,j}$$

general equation of the comminution

- **16918 | Luminiscent composite materials based on lanthanides and metal-organic frameworks**

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Metal-organic frameworks (MOFs) are crystalline materials, composed by metallic inorganic centers connected by organic multidentate ligands, creating a three-dimensional porous network. The chemical structural diversity and the high thermal stability of MOFs promote their applications in several areas, such as catalysis, adsorption, gas separation, storage and biomedical science.[1] Polyoxometalates (POMs) have attracted the attention of the scientific community for decades due to the combination of interesting physical properties and fascinating geometrical characteristics, like oxygen rich surfaces, strong coordination and adjustable size.[2] Lanthanide-containing POMs (LnPOMs) are of particular interest for optical applications since the inorganic moieties are able to sensitize the lanthanide luminescence allowing to overcome the weak molar absorptivity of lanthanide ions.[3] The combination of LnPOMs luminescence with the remarkable porosity and robustness of MOFs make these materials excellent candidates for the design of highly selective luminescent sensors.[4]

In this work, photoluminescent materials have been prepared via the incorporation of [LnW₁₀O₃₆]⁹⁻ (Ln = Eu, Tb) POMs in MOFs. ZIF-8 and MIL-140A. The prepared composites LnPOMs@MOFs followed different methodologies. Different characterization techniques were used, such as FTIR, XRD, TGA and SEM/EDS.

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- 16920 | Study of multi-elementary flotation kinetics using the Fast and Slow mathematical model.

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Froth Flotation is a physical-chemical process based on the particle's wettability. When a solid surface exhibit natural hydrophobicity (or promoted with reagents) an air bubble will attach to the surface being floated. Then, attached particles are uploaded to the top of the flotation cell to be collected as concentrate. Low-grade and gangue particles are collected in the bottom of the flotation cell.

Flotation kinetics can be described as a rate process, in which the weight inside of a flotation cell varies according to a first order kinetic process. Fast and Slow model, Eq.1, is one of the most recognized examples of a flotation kinetic model.

This model allows the determination of the mineral recovery (ρ) during the flotation time (t). It considers two families of particles, one with fast flotation rate (KF) – corresponds to high-grade particles, and other with slow flotation rate (KS) – corresponds to low-grade particles. The fraction of particles with fast flotation rate is given by FF. R_{∞} is the ultimate recovery parameter, which limits the overall recovery of the process, being applied when a third family of particles is present – non-floated valuable particles.

During this study, experimental data from kinetic flotation tests were used to set the parameters of the Fast and Slow model. Experimental kinetic tests were carried out by collecting the concentrate in several periods of time. With the application of the mathematical model, it was possible to obtain the metal recovery at any flotation time, being a powerful tool to define the most desirable flotation residence time. In addition, the model parameters can be interpreted according to the theory of flotation, giving an important feedback about the process performance. Due to the intensive application of froth flotation in the several mineral processing plants, this model can be a valuable tool to improve the overall performance of this concentration process.

$$\rho = [1 - \exp(-K_F \cdot t)] \cdot F_F + [1 - \exp(-K_S \cdot t)] \cdot (R_{\infty} - F_F)$$

Fast and Slow equation.

- 16925 | Discursive practices in conversational interactions: the language of chatbot Beta, “a feminist robot to the last code”.

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The advancement of technologies gives people greater integration with virtual environments (Comarella and Café 2008). These environments are a growing area for artificial intelligence (AI) in intelligent applications, such as Chatterbot, a computer software program designed to simulate human conversation via text or audio messages, a service that interacts with users through a chat interface to understand needs, map preferences, and recommend an appropriate course of action to users with minimal human intervention. Given this scenario, the new intelligent applications and new emerging textual genres, this research project aims to analyze the domain of verbal interactions between users and the intelligent application Chatterbot Beta, having as theoretical framework the perspectives of Discourse Analysis in the field of Conversational Analysis and Interaction Analysis according to Kerbrat-Orecchioni (2006) and Preti (1999), seeking to verify the prototypical linguistic marks of colloquial interaction in Chatbot Beta speech. This study is characterized by a qualitative, descriptive and applied research, performed through the analysis of the application that uses the conversation as the main form of interaction with the user. The results are preliminary, however, it can be considered that this type of conversational interface already shows some prototypic marks of a colloquial interaction that reflect the attempt to simulate verbal interaction in natural language. Having said that, we find that there are still plenty of opportunities to enhance this proximity given the complexity of interactional processes which are structured through natural language during dialogues.

- **16928 | Reproductive ovarian ageing: a comparison with the liver**

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In women, the reproductive system is believed to be the first to show signs of biological ageing, with loss of function culminating in menopause by the average age of 50. The ovary is considered the main responsible due to the continuous age-related decay in follicle number and oocyte quality. Previous results showed an age-related increase in ovarian inflammation markers and collagen deposition, which may contribute to a decline in female fertility. In this work it is aimed to evaluate whether the observed age-associated ovarian changes are also present in the liver, and if specific antioxidant supplementation can ameliorate them.

Mice aged 8-12 weeks (young) or 38-42 weeks (aged) were employed. Aged mice were treated with apocynin (5mM) in the drinking water for 7 weeks, upon which animals were sacrificed and livers collected and processed for molecular studies. mRNA relative expression levels of collagen types, inflammation markers and matrix metalloproteinases (MMPs) was determined by qPCR. Statistical analysis was performed by student t-test.

Gene expression of 18s, Gusb, Hprt and Actb was analysed in order to confirm their reliability as reference genes. 18s and Hprt presented statistically significant differences between groups. Gusb and Actb showed no variance, being selected for normalization of qPCR results. Relative expression levels of the analysed genes (Mmp2, Col3a1, Tgfb1 and Il1b) displayed no significant differences neither with ageing nor antioxidant supplementation.

These findings indicate that, at the studied ages, the observed ovarian changes are not extensive to the liver. Therefore, it can be concluded that, when compared to the liver, the reproductive system shows earlier signs of ageing.

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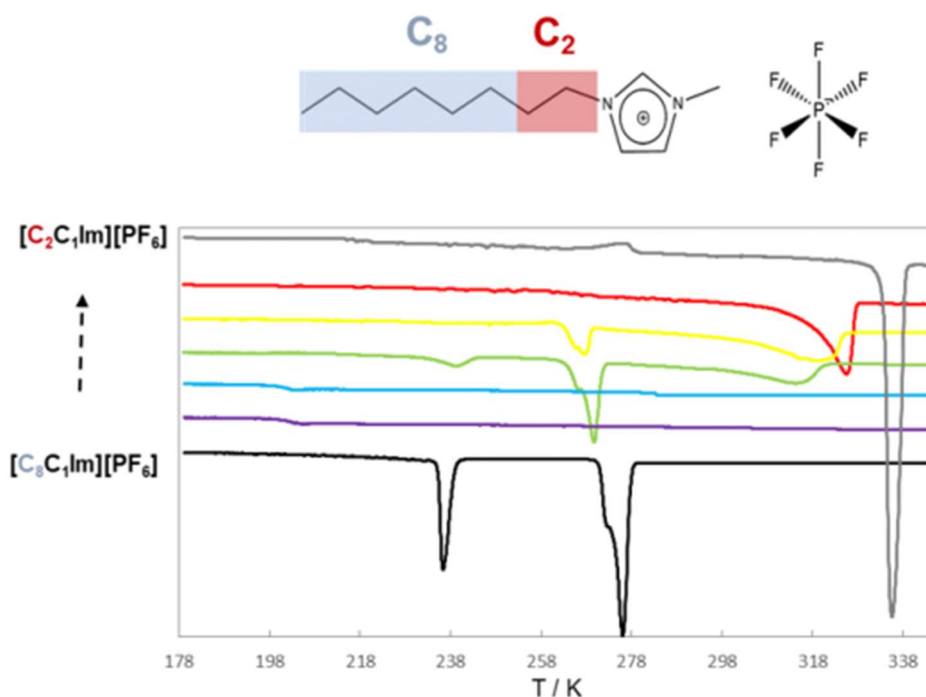
- 16931 | Phase Behaviour of Binary Mixture of Ionic Liquids: [C8C1im][PF6] e [C2C1im][PF6]

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This work is part of a R&D project aiming the study and modelation of the properties of binary mixtures of ionic liquids. Here we are presenting a study focused on the evaluation of the effect/impact of the alkyl chain size on imidazole cation (im). The SLE (Solid-Liquid Equilibrium) phase diagrams of the binary mixture composed by [C8C1im] [PF6] and [C2C1im][PF6] was studied based on the thermal behavior analysis of different molar fractions, studied by DSC (differential scanning calorimetry). For mixtures rich in [C8C1im]⁺, was not possible to detect any sign of crystallization. However, glass transition temperatures of the binary mixtures approaches an ideal behavior. Based on the experimental results, it has been possible to observe that the ionic liquid mixtures exhibit a phasic behavior which is strongly dependent of the balance between the alkyl chain sizes of the imidazolium cation in each constituents. The observed phase behavior is consistent with the differentiation and balance between polar and nonpolar domains in the mixture which affects the interaction potential between the binary mixture constituents.



Typical results from DSC of SLE (Solid-Liquid Equilibrium)

- **16933 | SYNTHESIS OF ENANTIOMERIC PURE CHIRAL DERIVATIVES OF 4'-METHYLCHRYSOERIOL**

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Flavones comprise an important class of oxygenated heterocycles, with a large spectrum of biological and pharmacological activities [1]. Our group has maintained the search for new flavone derivatives with antitumor activity as an area of interest [2-3]. Despite the massive research regarding this kind of flavonoids, no enantioselectivity studies concerning synthetic chiral derivatives of flavones have been reported. Therefore, the introduction of a chiral moiety in the flavone scaffold increases structural diversity, which can lead to more selective drugs, concerning the increase of affinity between the drug and the biological targets [4]. Hence, the main goal of this work was to obtain new enantiomerically pure chiral flavone derivatives with potential antitumor activity.

Two chiral flavone derivatives were synthesized and screened for their in vitro growth inhibitory activity in three human tumor cell lines. The starting flavone, 4'-methylchrysoeriol, was synthesized through the thermal cyclocondensation of phloroglucinol with ethyl 3,4-dimethoxybenzoylacetate. The respective methyl ester derivative was obtained by Williamson ether synthesis. After the hydrolysis, two chiral flavone derivatives were obtained by the coupling with L-Tryptophan and D-Tryptophan methyl ester hydrochlorides, using COMU®, as a coupling reagent. To the best knowledge these compounds have never been synthesized before.

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[2] Moreira, J et al. Molecules, 2018, 24(1), 129-148.

[3] Pereira, C et al. Eur. J. Pharm. Sci., 2014, 54, 8-16.

[4] Tiritan, M.E et al. Chiral Pharmaceuticals. 2016; p 1-28.

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- 16935 | Analysis of the crushing process applying different jaw crusher settings – some case studies

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The optimization of the comminution stage is fundamental for any mining project, not just because it's one of the most expensive steps on the process but also because it has an impact on the further mineral processing stage. According to this, the main focus of this study is to analyze the effect of different jaw crushers' settings in the crushed product.

Jaw crushers can be classified according to the method of pivoting the jaw - pivoting can be placed at the top end (Blake crusher) or at the bottom end (Dodge-type crusher). They are composed of a fixed plate, that is the stationary breaking surface, and of a movable plate that forces the rock against the fixed plate. The particle size distribution of the jaw crushers' feed and final product can be modified by adjusting the OSS (Open Side Setting), which is the distance between jaws in the bottom of the plates (near the discharge) when they are opened, and CSS (Closed Side Setting), which is the distance between jaws when they are closed. Thus, OSS is determined by the type of material being crushed and usually adjusted by changing a eccentric shaft connected to the movable plate.

During this study, several samples were crushed using a laboratory jaw crusher. After collecting the crushed product, the material was size-classified using different sieves and a vibratory sieve shaker. All size classes were carefully weighted to obtain the particle size distribution of the crushed particle, which was represented by size histograms and cumulative distributions. Then, the applied OSS was correlated with the particle size distribution, the size reduction ratio and the amount of very fine material produced. OSS between 1.7 and 2.7 mm were applied. Reduction ratios of about 3:1 were observed.

Special thanks to the Mining Engineering Department and Prof. Mário Machado Leite.

- 16936 | Development of novel RdRP inhibitors to the Rabies virus: an in silico approach

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Every year thousands of people die infected by Rabies virus worldwide. To date, the only treatment is the vaccination, and no antiviral drug is available on the market¹.

The Rabies virus is a negative-sense single stranded RNA which, similar to its virus class, express a RNA dependent RNA protein (RdRP) polymerase which catalyses the RNA replication².

To prevent the virus replication, and thus impede the disease, we aim to inhibit the RdRP enzyme by either locking the enzyme in an inactive conformation or prevent its binding to the RNA chain. Very limited information on the 3D structure of the RdRP of Rabies Virus is known. The complex has an L-protein that copies RNA and a cofactor P that stimulates RdRP activity. RdRP is assembled in 3 domains: C-Terminal that binds the RNA , the oligomerization domain, and N-terminal that binds to the L-protein³.

The first step of this work was to create a model of the RdRP using homology modelling techniques. The templates used to estimate our model were the L-protein of vesicular stomatitis virus, the influenza B polymerase, the reovirus type 3 and rotavirus polymerase VP1, PDB IDs. 5A225, 4WRT6, 1MUK7 and 2R7Q8, respectively.

The next step is to identify druggable cavities and compounds that inhibit the RdRP enzyme. Therefore, we will perform a virtual screening of 3.5M commercially available compounds, that obey the lipinsky rules. The top ranked compounds will then be evaluated by an in vitro screening assay, in order to validate their biological activity, at Prof. Choowongkamon lab at the University of Kasertsart, in Thailand.

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- 16937 | Effect of Metformin in the expression of SIRT1 and SIRT3 on the heart cells of mice with endometriosis.

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Endometriosis is the presence of endometrial glands and stroma in any extrauterine site of the body.

Besides pain and gynecological symptoms, it has been determined that women with endometriosis have a higher risk of adverse cardiovascular events [1]. It has also already been shown that endometrial tissue presents overexpression of SIRT1, a gene with oncoprotective and stem-cell preserving functions.

Our aim with this experiment is to study whether Metformin, an Insulin-sensitizing medication with proven effects on endometriosis, intervenes on the expression of SIRT1 and SIRT3 in heart cells of mice with Endometriosis.

A total of 40 B6CBA/F1 mice were divided into 4 groups: Control (C; sham-operated), Metformin (M), Endometriosis (E) and Endometriosis with Metformin (EM). Metformin was administrated orally, 50 mg/kg/day in drinking water. After tissue harvest, the expression of SIRT1 and SIRT3 was assessed by double immunofluorescence labeling, using an α -actin antibody simultaneously to identify smooth muscle cells.

The microscope images evidence expression of SIRT1 and SIRT3 on the heart of all groups of animals. Both proteins are predominantly expressed on the endothelial cells, in proximity to α -actin expressing smooth muscle cells. Additionally, some low overall non-specific staining is visible.

The expression of both SIRT1 and SIRT3 is clearly present on all samples. While fluorescence intensity differences are mild, the semi-quantitative analysis of the expression is already underway. We eagerly await these further results, as a confirmation of a previously unknown action of metformin as a possible therapeutic agent for endometriosis-associated cardiovascular disease.

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- **16938 | UNRAVELLING ADENOSINE RECEPTORS SIGNALING IN RAT SUBCUTANEOUS FIBROBLASTS: A NOVEL APPROACH TO MYOFASCIAL PAIN**

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Chronic myofascial pain is associated to inflammation-induced subcutaneous tissue disorganization and continuous stimulation of sensory nerves. Subcutaneous fibroblasts release ATP in contact with inflammatory mediators (e.g. bradykinin, histamine) (Pinheiro et al, 2013, Cell Commun Signal 11:70; Pinheiro et al, 2013 J Biol Chem 288:27571). ATP is promptly converted into adenosine by ecto-NTPDases1/2 and ecto-5'-nucleotidase acting in tandem to promote extracellular accumulation of the nucleoside. Adenosine is a powerful modulator of inflammation and neuronal activation, but controversy still exists regarding its role in tissue fibrosis. Understanding the mechanisms by which subcutaneous fibroblasts respond to adenosine and ultimately communicate with sensory neurons may be paramount to discover new drug targets for myofascial pain. Cultured fibroblasts from the rat subcutaneous tissue were monitored for viability/proliferation (MTT assay) and collagen production (Sirius Red assay) for 28 days. Adenosine receptors expression was assessed by immunofluorescence confocal microscopy. Rat subcutaneous fibroblasts exhibit high A3 receptor amounts, followed by A2A and A2B receptors, with the A1 receptor being less expressed. The adenosine analogue, NECA (10 and 100 nM, n=3), progressively decreased fibroblast cells growth and collagen production up to day 21 in culture. Selective activation of the A2A receptor with CGS21680 (1 nM, n=3), decreased collagen production from day 14 onwards, with almost no effect on fibroblast cells proliferation. Activation of the A3 receptor subtype with 2-Cl-IB-MECA (10 and 100 nM, n=4) showed a late pro-fibrotic effect only observed at culture day 28. The predominant anti-fibrotic effect exerted by activation of the A2A receptor subtype is promising given to the fact that this receptor also suppresses responses in other immune-mediated conditions (Oliveira et al, 2015, 2015: 460610).

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- 16939 | Characterization of physical fitness and physical activity levels in fragile oncological patients

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Introduction: As life expectancy increases, the aging of the population increases the development of chronic diseases. One of them is cancer, although it is not just a disease of the elderly, one of the means to make treatment viable is the assessment of frailty. It seems that one way to reduce postoperative complications is to insert fragile patients into a pre-habilitation program. Objective: To determine the prevalence of frailty and to characterize physical fitness and physical activity level in cancer patients over 65 years admitted for surgical treatment for digestive cancer or head and neck cancer.

Material and Methods: This is a cross-sectional study, the entire sample aged ≥ 65 years. The assessment of frailty was established from Fried's phenotypic model, the assessment of physical fitness by the Senior Fitness Test and the level of physical activity using the accelerometer.

Results: The sample consisted of 65 patients, with a mean age of 73 years, mostly male 73.8%. Regarding the prevalence of frailty, 47.7% were considered pre-fragile and 30.8% fragile, with a higher percentage of fragile women (41.2%). In physical fitness, only cardiorespiratory fitness ($p = 0.04$), lower limb strength ($p = 0.03$) and upper limb ($p = 0.00$) tests were found when comparing the fragile with the robust; and when compared to the pre-fragile ones, it presented lower upper limb strength ($p = 0.03$). Patients had an average of 6.6 ± 1.6 hours / day in sedentary time and only 16.5 ± 19.2 min / day in MVPA. No significant differences were found between the groups for sedentary and Light physical activity, but when comparing the fragile with the robust we found significant differences in both MVPA (5 ± 4.2 vs 29.7 ± 26.1 , $p = 0.02$), as for the number of steps per day (2277 ± 1469 vs 6063 ± 2776 , $p = 0.02$).

Conclusion: Our data suggest that frailty and pre-frailty are very prevalent in cancer patients, fragile patients show reduced physical capacity and spend little time on MVP.

- 16940 | The association between polypharmacy and cognitive function in older adults across Europe based on the SHARE database

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With population aging, the expression of chronic diseases, comorbidities, and consequent polypharmacy, and geriatric syndromes is increasing. Alongside with the physical and mental health issues there is the age-related cognitive decline. Cognition is an important factor for functional independence in older age and tends to decline with age, affecting brain functioning in several domains including attention, working-memory and processing speed. Polypharmacy and cognitive impairment have multifactorial etiologies and are strongly related to aging, making it likely that both may interrelate. Therefore, this study aims to study the association of cognitive function and polypharmacy among older adults across Europe.

Data from Survey of Health, Ageing and Retirement in Europe (wave 6) was used in this work, which contains data on health, socio-economic status and social and family networks, from 17 European countries and Israel. Numeracy, temporal orientation, verbal fluency and memory performance (accessed with the 10-words recall test) were the measures used to study cognitive function. Prevalence of cognitive impairment and its association with gender, age and polypharmacy was performed using SPSS.

From the 44963 individuals, the mean age was 70.0 ± 9.0 years old and 56.3% were female. The prevalence of impairment was of 13.0%, 24.8%, 27.6% and 50.5% for temporal orientation, numeracy, verbal fluency and memory performance, respectively. Overall, men showed higher impairment prevalence in temporal orientation and memory (13.3% vs 12.7%; 53.8% vs 47.9%) and lower in numeracy and verbal fluency (20.2% vs 28.4; 26.2% vs. 28.6%) comparing to women. Cognitive impairment increased with age and was about 1.4 times more prevalent among polymedicated individuals.

This study showed the burden of cognitive impairment across Europe, that was found to be more prevalent among polymedicated older adults, which should be addressed on strategies to promote an active and healthy ageing.

- **16941 | INSIGHTS OF NITRIC OXIDE MECHANISMS IN CARCINOGENESIS**

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Several lines of evidence revealed that nitric oxide has a dichotomous effect in the carcinogenesis process: low levels lead to cell survival stimulating the carcinogenic and metastatic processes, whereas higher levels present anti-neoplastic properties. In breast tissues, nitric oxide synthase expression has been considered an early event in carcinogenesis. Moreover, previous experiments from our group showed that exogenous nitric oxide is able to modulate MCF-7 breast cancer cell proliferation. These observations led us to investigate the putative endogenous production of nitric oxide and gather insights on the nitric oxide-mediated mechanisms of carcinogenesis in MCF-7 cells.

In the present study, we evaluated the effects of endogenous nitric oxide on MCF-7 cell proliferation and viability, by inhibiting nitric oxide synthases with increasing concentrations of L-NAME. We also visualized, by real-time microscopy, and attempted to quantify the intracellular nitric oxide levels in MCF-7 cells, using the nitric oxide-sensitive probe DAF-FM DA, after treatment with modulators of nitric oxide levels. Finally, we tested the expression of inducible nitric oxide synthase and HIF-1 α (immunocytochemistry) and quantified the acidic vesicular organelles in cells using the lysotropic dye acridine orange.

Experiments using DAF-FM DA showed that intracellular nitric oxide levels can be elevated in MCF-7 control conditions. iNOS and HIF-1 α expression was confirmed. Results showed that high levels of L-NAME (2 and 5 mM) decrease MCF-7 cell viability and proliferation. Moreover, the expression of HIF-1 α was almost suppressed when cells were treated with L-NAME (2 mM).

Our study confirms that MCF-7 cells produce nitric oxide, contributing to their increased viability and proliferation and that the anti-proliferative effects of L-NAME appear to be related to the decreased production of endogenous nitric oxide and the decreased HIF-1 α expression in these cells.

- 16943 | The influence of Diabetes mellitus on the osteogenic potential of adipose derived stromal cells obtained from distinct anatomical sites

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Diabetes mellitus, characterized by hyperglycemia, is one of the most relevant and common endocrinological disease, affecting over 442 million people worldwide. Diabetic condition is associated with low bone mass, an increased bone fracture index and a delayed fracture healing. Diabetes-associated alterations in bone quality and repair have been related to poor glycaemic control, increased reactive oxygen species production, and bone matrix accumulation of advanced glycation end-products, among other factors. Given the limited regenerative potential in diabetic conditions, emerging therapeutic strategies, taking hand of regenerative medicine principles, have been developed. For bone tissue applications, strategies broadly rely on the use of stem cells - that should be found in abundant quantities, be easily collected and harvested, and safely and effectively transplanted. Adipose-derived stromal cells (ADSCs) have self-renew capacity and potential to differentiate into several lineages, including the osteogenic, playing a central role in bone formation and repair and a promising role for tissue engineering strategies. Although there are studies on ADSCs collection and isolation procedures, little attention has been given to biological differences related to distinct anatomical depots, as well as the impact of the functional differences on ADSCs, particularly in systemically-compromised conditions, as those induced by diabetes. In this work, the in vitro characterization of adipose derived stromal cells from an experimental diabetic model was done taking into account the diversity of anatomical locations for cell harvest - aiming a potential application within bone tissue engineering. Given the results obtained the cell cultures from pericardial and subcutaneous adipose tissue showed greatest osteogenic potential, suggesting that the ADSCs obtained from these tissues are predicted to present greater osteoblastic involvement in diabetic conditions.

- **16944 | Analysis of Electricity Consumption Profiles using Clustering**

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With the increasing number of available data and procedures in the business sector, their analysis has become relevant. In the energy sector, with the implementation of smart meters, which every 15 minutes send information on the power recorded during this period, time series with 96 measurements per day are stored for each customer. Based on these it becomes pertinent to try to find patterns among customers within the same voltage levels and thus define consumption profiles.

During a curricular internship at EDP Distribuição, the objective outlined is the time series analysis for the identification of consumption profiles. For this purpose, time series clustering techniques are studied and applied to the available data.

- 16947 | *Toxoplasma gondii* emergence in sheep flocks from the Serra da Estrela region

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Toxoplasma gondii is an important zoonosis and one of the major causes of abortion in sheep worldwide. In most cases, sheep become infected through ingestion of *T. gondii* oocysts, shed by cats. For abortion to occur, infection must be initiated in a susceptible sheep during gestation. Alerted by an increasing number of abortions in Serra da Estrela sheep breed, we performed a prospective 2-year serosurvey aiming to ascertain *T. gondii* circulation in a population of sheep in the central region of Portugal, where the produce of sheep cheese brand "Serra da Estrela" is economically and culturally important for local population. Blood from 168 sheep was collected in January/February 2015 and again in January/February 2016 (in a total of 336 samples). Individual blood serum samples were separated and used to detect *T. gondii* IgG antibodies, using a commercial indirect ELISA ID Screen Toxoplasmosis Indirect Multi-species Kit. Chi-square test was used to study differences between years (GraphPad Prism version 5.04). A P value<0.05 was considered statistically significant. Of the 168 sera from the 2015 sample collection, 97 animals tested positive for IgG anti-*T. gondii*, showing a 2015 population seroprevalence of 57.7%. From the total of 168 sera of the 2016 sample collection, 116 tested positive for IgG anti-*T. gondii* showing a 2016 population seroprevalence of 69.0%. Anti-*T. gondii* seroprevalence differences in the 2015 and 2016 samplings showed to be statistically significant (P=0.041). The present study is the first in Portugal to provide prospective data on the anti-*T. gondii* serological status of a sheep cohort of Portugal and showing an increase in the occurrence of *T. gondii*. There's the need to provide a clearer understanding of *T. gondii* epidemiology in Portugal, by implementing monitoring programs on sentinel herds, not only due to the high impact on animal health but also for being a zoonosis.

- **16949 | Spinal cord injury-induced changes in the urethra. Preliminary observations in the rat.**

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Introduction: Spinal cord injury (SCI) typically leads to neurogenic detrusor overactivity (NDO) and detrusor-sphincter-dyssynergia (DSD), resulting in urinary incontinence. These are known to be accompanied by histological alterations in the bladder. Although SCI-induced urinary impairment could also reflect altered urethral activity, the consequences of SCI on the urethra remain largely unexplored, a matter we will evaluate in the present work.

Methods: Female Wistar rats were divided in 3 experimental groups: spinal intact animals, and animals left to recover 1 and 4 weeks after SCI (n=4/group). The model chosen was the largely incomplete spinal cord section (T8/T9). To evaluate bladder function, animals underwent 1h cystometry under urethane anaesthesia before euthanasia and tissue collection. Urethral tissues were impregnated in paraffin and sectioned for haematoxylin and eosin staining.

Preliminary results: Bladder contractions were abolished 1 week after SCI (spinal shock). At 4 weeks, NDO was evident, evidenced by the increased frequency and amplitude of bladder contractions ($p < 0.05$ versus spinal intact animals). Hematoxylin-Eosin staining revealed a marked increase in the urethral epithelium height in SCI animals ($p < 0.05$ versus spinal intact animals). While 1 week after SCI epithelial layers seemed disorganized with some suggestion of loss of the upper layer, recovery had already occurred at 4 weeks post-SCI. Preliminary observations also suggest an increase in the thickness of the lamina propria. Altogether, these observations demonstrate SCI-induced histological rearrangement of the urethra.

Future work: Epithelial changes suggest changes in levels of cell proliferation, to be assessed in the future. Changes in the urethral sphincter will also be analysed, as well as the occurrence of fibrosis, a hallmark of tissue reorganization in the bladder after SCI.

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- 16952 | *Haemolivia* in ticks of *Testudo graeca* tortoises from Qatar

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Spreading of arthropods vectoring pathogens through transboundary domestic animal movement poses a substantial risk to autochthonous species due to the vast naive populations in disease-free regions. Ticks collected from pet spur-thighed tortoises (*Testudo graeca*) sold in a black market in Doha (2018) were collected. Morphological identification was performed and further molecular characterization was achieved through PCR targeting partial regions of the 12S rDNA and 16S rDNA after DNA extraction by alkaline hydrolysis. *Haemolivia* genomic DNA was detected using primers described elsewhere, followed by bidirectional sequencing and phylogenetic analysis.

Morphological analysis of ticks allowed the classification as *Hyalomma aegyptium*, which was confirmed by molecular characterization. Genomic DNA of *Haemolivia* was detected in 6 of the 21 studied ticks. Phylogenetic analysis allowed the classification as *Haemolivia mauritanica*, sharing 98.3% to 99.6% identity between them, and 99.7% identity with *Haemolivia mauritanica* found in the Czech Republic. Attention must be paid to the introduction of non-native pets as vehicles for tick importation, known vectors for animal pathogens.

- **16953 | AN ANALYSIS ON TEACHERS'OPINION ON THE INSERTION OF ANISAKIS INFECTION THEMATICS IN THE SCHOOL CONTEXT.**

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Anisakiasis is a zoonosis resulting from the accidental ingestion of viable anisakid larvae in raw or undercooked fishery products. Due to the growth of international trade and the popularization of food consumed without cooking, as the Asian food, this parasitosis deserves extra attention. From this perspective, it is important to insert the *Anisakis* theme in the high school context, because the greater the available information, the lower the probability of infection. Thus, this work evaluated the high school teachers' perception regarding the insertion of the *Anisakis* topic in the high school context. Forty two high school teachers who participated in the FOCO Course "Laboratory of Parasitology - application in school context" - Faculty of Sciences of the University of Porto, in 2019, were evaluated. Most participants (33%) did not indicate the exact insertion of *Anisakis* content in the high school context. Already, 28% indicated the "third cycle" of basic education (7th, 8th, 9th years) as the most appropriate time to insert the theme. Regarding the topic contextualization of anisakiasis and *Anisakis*, most teachers (32%) indicated "Food Production and Sustainability". Most (79%) believe that content should be inserted as regular material, and the main justification is that it is a theme that affects individual and collective health. Although most teachers considered important to work *Anisakis* topic in the school context, there is no consensus on the cycle and the thematic to be inserted. However, most of them recognize that the topic is very important to disseminate among all high school students, and the population in general.

- 16956 | Development of new antibiotics for the current public health bacterial threats

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Nowadays, antibiotics are indispensable to treat bacterial infections. However, it is widely acknowledged that antibiotic resistance is one of the biggest threats facing healthcare today, causing millions of deaths every year and demanding seeking new antibiotics.

Therefore, there is an urgent need for new antimicrobial and therapeutic strategies to deal with the ever-evolving antimicrobial resistance among the most prevalent bacterial pathogens.

Accordingly, this project has been focused on the design and synthesis of new compounds as potential antibiotics. In order to achieve this goal, structural modifications were performed by inserting an aliphatic carbon chain spacer (six-, eight- and ten-carbon length) linked to different cations. In particular, the triphenylphosphonium cation was used due to its enzymatic and antimicrobial inhibition properties, which were previously described. The number of the aliphatic carbon chain spacers was modified in order to increase the lipophilicity of the new compounds as this property has an evident influence on the permeability and, therefore, on the bioavailability of drugs.

After synthesis and purification, their structural elucidation was carried out by Nuclear Magnetic Resonance (NMR) spectroscopy. The synthesized compounds presented a high purity and good yields.

As it is an ongoing project, in the near future, the aim is to evaluate the antibacterial capacity of these potential compounds as antibiotics, as well as the cytotoxicity underlying the aliphatic carbon chain increase.

The results obtained so far will be presented in this communication.

Acknowledgements: This project was supported by FEDER/COMPETE POCI-01-0145-FEDER-028397 and Norte-01-0145-FEDER-000028 We thank CO-ADD (The Community for Antimicrobial Drug Discovery), funded by the Wellcome Trust (UK) and The University of Queensland (Australia) for performing antimicrobial screening of compounds.

- **16957 | Evaluation of ultrafiltration and electrodialysis techniques for the removal of whey proteins, lipids and ions**

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The whey is a byproduct generated by the dairy industry and consists mainly of water (95% of the total composition). There is also a high concentration of organic matter in the composition of whey, as well as soluble proteins, lipids and mineral salts. Therefore, to use the high biological value present in whey and to verify the efficiency of the use of methods for measuring concentration, purification and separation of components for applicability in subsequent proceedings, the aim of this work was to analyze the possibility of combining the ultrafiltration (UF) and electrodialysis (ED) techniques in pilot scales and perform experiments to measure results. Reconstituted whey was used to do the experiments. In the first part of the experiment, the whey was prepared and passed into the ultrafiltration plant with an organic membrane. Then was obtained 2 flows: the permeate and the retentate. Then, the permeate is reultrafiltered in the UF plant, giving rise for a new permeate and retentate. So, the permeate of the second UF was used for the application of ED. The evaluated parameters - color, turbidity, hydrogen potential and total organic carbon concentration - presented positive results for the experiment. Turbidity test results showed a reduction of 99.9%. A reduction of about 14% in the flux of the UF plant was also identified, justified by the fouling effect. It was also evaluated the calcium concentration, which after the ED decreased about 14%, resembling other studies. A 36% reduction in lactic acid was also identified, and this is an important result, given that the hygroscopic nature of lactic acid can contribute to operational problems, for example, in dryers sprays. With the results obtained, it is possible to combine the UF and ED processes to treat lactic acid. There is also a signaling of the potential for further use as solutions used as new applications in the food industry, as well as lactose.

- **16958 | MOFs functionalized with Amino and Thiol Groups to Accommodate Catalytic Gold Nanoparticles**

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Since the biodiesel factory increased, an unavoidable large excess of glycerol by-product has been produced (10% wt/wt of total production). The valorization of this highly functional molecule is essential to ensure the sustainability of the biodiesel sector. The search for more efficient processes to transform glycerol into high-value fine chemicals is crucial.

The selective oxidation of glycerol is a desirable scientific direction, since important oxidation products with numerous commercial applications can be obtained, for example dihydroxyacetone, tartaric acid; glyceric acid, etc. The strategy to achieve high yield in one or more of these products is the catalyst. Therefore, solid and robust catalysts with appropriate active catalytic centre need to be prepared. Gold nanoparticles (AuNP's) have much interest due to their unique physicochemical properties such as stability towards oxidation and catalytic activity¹. Porous Metal-Organic Frameworks (MOFs) incorporating appropriate functional groups can be used as strategic supports to accommodate catalytic AuNPs. These functional MOFs should promote AuNPs stabilization (not aggregation) and high catalytic efficiency. ²

In this work, was prepared and characterized amine and thiol functionalized MOFs, X-MIL-101(Cr) and X-MOF-808 (X= -NH₂ and -SH) as supports for in situ immobilization AuNPs. Characterization techniques such as FTIR, XRD, SEM and/or TEM were used.

Acknowledgements

This work was partly funded through the project REQUINTE-LAQV (Ref. UID/QUI/50006/2019) and the project GlyGold, PTDC/CTM-CTM/31983/2017, financed by national funds through the FCT/MCTES and when appropriate co-financed by FEDER (Fundo Europeu de Desenvolvimento Regional) under the PT2020 Partnership Agreement.

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- 16959 | Synthesis of Novel Amprenavir Analogues Based on 2-furoyl Scaffolds

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Acquired immunodeficiency syndrome (AIDS) is an immune degenerative condition, caused by the human immunodeficiency virus (HIV), currently accounting with a staggering 40 million people worldwide ailing with HIV/AIDS, and two million people die from this disease each year.[1] In the absence of a cure, the suppression of the viremia has become the major goal in the management of the disease, improving significantly the patients' quality of life and preventing the onset of AIDS.

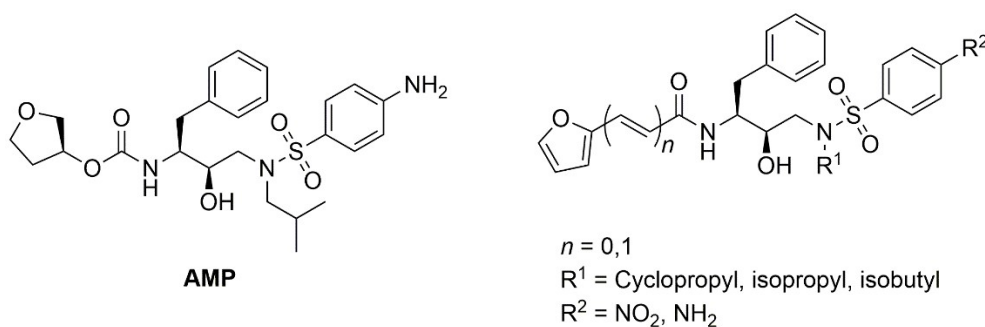
HIV-1 protease (PR) plays a critical role in the virus life cycle being responsible for processing the viral Gag and Gag-Pol polyproteins into structural and functional proteins essential for viral maturation. Inhibition of PR leads to non-infectious viral particles, thus suppressing the infection. In this way, HIV-1 protease inhibitors (PIs) become the first-line treatment in the highly active antiretroviral therapy (HAART).[2]

Amprenavir (AMP, Figure 1) is an FDA-approved PI with excellent antiviral activity against multidrug-resistant (MDR) HIV-1 strains. AMP displays a tetrahydrofuran moiety (THF) as P2 ligand and a conserved structural motif, the (*R*)-(hydroxyethylamino)sulfonamide, which are important for its potency. However, the rapid emergence of MDR HIV-1 strains limit the long-term treatment options.[3] An estimated 10-25% of newly infected patients harbour at least one viral strain that is resistant to current medications. The development of novel PIs with broad-spectrum activity against MDR HIV-1 variants remains a major goal in this field.

In this work, we developed a series of novel AMP analogues based on 2-furoyl scaffolds as THF surrogates in order to explore the P2 binding site which may render useful insights to developed new lead compounds to tackle with MDR HIV-1 strains.

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Structures of AMP and the synthesized 2-furoyl analogues as P2 ligands

- 16960 | Short-term dietary effects of Ygeia+ on the European seabass immune status and inflammatory response

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Nutrition is crucial for aquaculture industry and it is intrinsically related with animal health and stress response, being at the same time one of the largest expenses of the industry. Functional feed's like Ygeia+ (SORGAL) are characterized as capable of providing the required nutrients for normal development, but also giving additional welfare benefits. The aim of this study was to provide a better understanding of the role of Ygeia+ on immune status and inflammatory response in the European seabass (*Dicentrarchus labrax*).

A commercial diet and the Ygeia+ diet, both commercialized by SORGAL (Soja de Portugal), were tested. The commercial diet served as control. A total of 240 fish were randomly distributed by 12 tanks (6 tanks per dietary treatment), in a recirculating aquaculture system (RAS), fed 2 times a day by hand a 2 % body weight. After 5 days of feeding, 8 seabass per tank were collected. Two fish were used for sampling procedures (i.e. blood and tissues collection) whereas 6 fish were randomly transferred to another RAS with 8 tanks (giving quadruples for diet with 9 fish each), further inoculation via intraperitoneal injection with heat inactivated *Vibrio anguillarum* to evaluate the inflammatory response at 4, 24 and 48 h post-injection. After each sampling point, 3 fish from each tank were used for blood and tissues collection.

Preliminary analyses of white blood cell and red blood cell counts as well as hematocrit did not show significant differences between treatments. However, many other haematological (including differential cell counts) and immune parameters such as humoral, molecular and cellular factors and hepatic oxidative stress will be conducted and could bring new insights on the immune-modulatory role of Ygeia+.

- **16963 | Individualised food plans: patient's compliance**

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Dietary intervention has great influence in the treatment of several diseases; however, there is a low compliance to it. The main objective of this study was to evaluate how patient's food intake is different from the previously prescribed food plan. Eighty-eight patients with BMI over 25.0 kg/m² (mean= 32.1 kg/m², sd= 4.6) were included. Socio-demographic, anthropometric and physical activity data were collected and dietary intake was evaluated and compared with the food plan. Self-perception of the compliance with the food plan and the motivation to continue the therapy were evaluated in a scale from 1 to 10. Food weighing habits were evaluated with a yes/no question. Compared to the food plan, lower contribution to total energy intake of carbohydrates (-24.0%) and higher contribution of fat (40.5%) were observed. In addition, lower intake of vegetable (-1.2), fruit (-0.8) and bread and equivalents (-3.0) portions and more of meat and equivalent (0.8) and fat (4.4) were found. There were associations of self-perceived compliance with vegetable ($r = 0.302$, $p = 0.015$) and meat ($r = -0.262$, $p = 0.036$) intake among women and fruit ($r = 0.535$, $p = 0.031$) intake among men. We did not find associations between the discrepancies in intake (actual intake compared to the food plan) and food motivation or food weighing. Individuals with dyslipidemia ate less total fat and men with dyslipidemia ate less bread doses (-3.2) and more protein (1.4%) compared to the prescription. We found several discrepancies between the prescribed plan and the actual intake, which shows that compliance to diet therapy is not optimal, despite self-perceived compliance and motivation being closer to the upper limit of the scale. Therefore, for a successful intervention, it is necessary to adequately communicate with the patient, reinforcing the importance of adherence to therapy, and providing solutions to the experienced difficulties.

Keywords: compliance, motivation, food intake, food plan

- 16966 | CCL18 on colorectal cancer immune modulation: an emerging pro-invasive and immuno suppressive chemokine

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The tumor microenvironment (TME), composed by cancer cells, immune cells, extracellular matrix and other mediators, is a major element in colorectal cancer (CRC), and its detailed characterization is currently essential for prognostic decisions. Recently, our team demonstrated that CRC tumor matrices, derived from cancer patients' surgical resections, promote CCL18 expression by macrophages. Importantly, we found that this immunosuppressive chemokine induces cancer cell invasion and is highly expressed at the invasive front of advanced human colorectal tumors, an area impoverished in pro-inflammatory macrophages and enriched in T-regulatory cells. Therefore, this project aims to understand how CCL18 modulates cancer and immune cells within the CRC microenvironment and contributes to cancer cell invasion and immune escape. The ability of CCL18 to interact and interfere with cancer and immune cell activity will be evaluated attending the viability, immunogenicity, and expression of polarization and activation markers, when in mono- or co-cultures. The molecular mechanisms through which CCL18 affects CRC cell invasion, immunogenicity and immune escape, focusing on CCL18 receptor, will also be explored. Additionally, human colorectal cancer tissues will be used to understand CCL18 and FoxP3-Treg marker expression and distribution along the tumor, and the results will be crossed with clinicopathological information of the patients to infer their relevance for patients overall survival and therapy response. Therefore, the work plan of this project will clarify the molecular and cellular interactions established within the colorectal TME, contributing to the development of novel and more efficient anticancer immune-modulatory therapies.

- 16967 | *Crenosoma striatum* occurrence in European hedgehogs (*Erinaceus europaeus*)

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Crenosoma striatum is a metastrongiloid nematode causing respiratory tract disease in hedgehogs (*Erinaceus europaeus*). Very few studies have described the occurrence of *C. striatum* and little genetic data is available concerning this lungworm. Hence we aimed to determine the occurrence of *C. striatum* in a population of hedgehogs while also providing morphological, histological and molecular data. From 2017 to 2018 a survey of infection was carried out in 11 necropsied hedgehogs. Worms were extracted from fresh lung tissues and microscopically evaluated. Molecular characterization of partial mitochondrial (12S rRNA) and nuclear (18S rRNA) genes was performed. We detected the presence of lungworms in pulmonary tissues of five hedgehogs (45.5%). Morphological and histopathological analyses evidenced adult forms of nematodes consistent with *C. striatum* in the lungs of the hedgehogs. PCR characterization of 18S rRNA genes confirmed the classification as *C. striatum*. We also present novel genetic data characterizing the mitochondrial (12S rRNA) gene of *C. striatum*.

- 16968 | Quality control of geomembranes for application in leachate collection ponds

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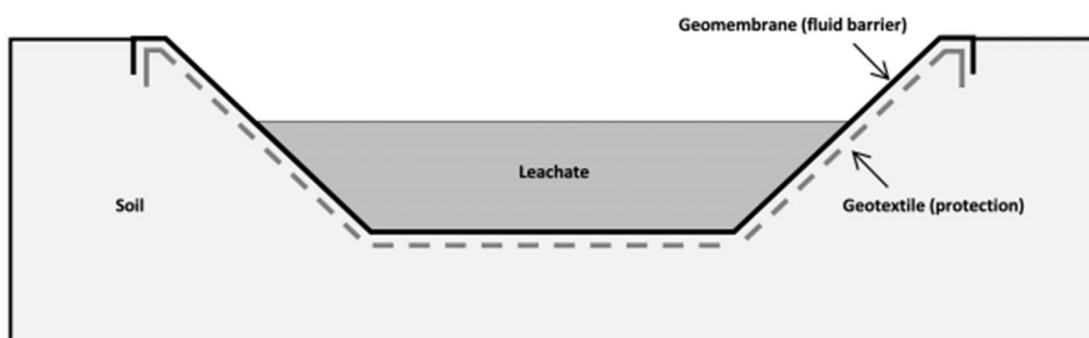
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Geomembranes are polymeric flexible sheets (often made from high-density polyethylene or polyvinyl chloride) used as fluid barriers in many civil and environmental engineering structures. In waste landfills (one of the most common applications), the geomembranes are typically used in the bottom liner system (avoiding soil and groundwater contamination), in the final cover system (sealing the top of the landfill) and in the leachate collection pond, which is a reservoir developed to contain the liquid generated from water (resulting from rainfall) percolating through the waste deposited in the landfill. The geomembranes are delivered on site as rolls (width of about 6 meters) and, for acting as fluid barriers, must be welded in the field by a thermal process.

This work describes the quality control needed during the application of a geomembrane in a leachate collection pond. The main goal of the work was to evaluate if the geomembrane was suitable for being applied in the structure and if the geomembrane seams (double hot wedge seams made by thermo-fusion) were carried out correctly, ensuring waterproofing. For that purpose, laboratory tests were performed to determine some key properties of the geomembrane and to evaluate the quality of the seams.

The laboratory results were compared with the minimum requirements established by the construction project and, based on that, it was possible to evaluate the suitability of the geomembrane, and respective seams, for performing the fluid barrier function in the leachate collection pond. For being considered suitable for application, the properties of the geomembrane must comply with the project requirements.

This work was financially supported by project PTDC/ECI-EGC/28862/2017, funded by FEDER funds through COMPETE 2020 - "Programa Operacional Competitividade e Internacionalização" (POCI) and by national funds (PIDDAC) through FCT/MCTES.



Cross-section representation of a leachate collection pond.

- **16969 | Improving the identification of species using mitochondrial DNA information**

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The SPInDel method is an approach that uses insertions and deletions to make a taxonomic identification. In SPInDel the high level of differentiation between species is attainable through the combination of the length of hypervariable regions containing indels variants. The utility of SPInDel requires the existence of a specific and unique profile for each species and therefore depends on the existence of a low level of intraspecific variation. Here we present our attempts to further improve the SPInDel method by developing a Python algorithm to retrieve all NCBI mtDNA rRNA genomic sequences for the taxonomic groups present in the initial SPInDel dataset. Four out of ten groups studied so far (Nematoda, Echinodermata, Porifera and Leptobranchium) show an increase in the number of species, respectively, 1265%, 4185%, 885% and 152%. For two of these four groups, the results obtained for the pairwise identity (respectively of 56%, 50,1%, 60,8% and 87,2% for the 12S gene, and 55,9%, 53,2%, 49,1% and 83,5% for the 16S gene) and for the identical sites (respectively 1,5%, 11,8%, 9,2% and 55,9% for the 12S, and 3,4%, 3,4%, 2,6% and 45,9% for the 16S) were higher than initial SPInDel database. To ascertain the impact of the new alignments in the SPInDel method we created an algorithm to design primers, based on the conservation of the flanking regions of the indels. With this algorithm, for 4 of the 20 alignments made, we obtain flanking regions with a conservation higher than 80%, which permits the accurate design of SPInDel primers. Although the remaining 16 alignments presented lower values of conserved indel flanking regions we still had in most of them a differentiation between species higher than 45%. These results show that we will be able to improve the SPInDel method by adopting a new automatic procedure to align the species sequences and to design specific primers in diagnostic positions.

- **16978 | Presentism and engagement among nurses**

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Introduction/aims: Presenteeism is defined as the problem of workers' being on the job, but, because of illness or other medical conditions, not fully functioning (Wee et al., 2019). It is an emerging concept in nursing that has been linked to increased health care costs (Raibow et al., 2017). However, literature shows that healthy workers with high engagement levels cope satisfactorily with professional stressful demands (Bodine, 2018) such as those caused by working while ill. We aim to identify presentism and engagement levels among Portuguese nurses and to analyze their correlations.

Method: Within the INT-SO project (collaboration between FPCEUP and ESEP) we applied to 275 Portuguese nurses the Stanford Presenteeism Scale (Koopman et al., 2002) and the Utrecht Work Engagement Scale (Schaufeli & Bakker, 2003) and a sociodemographic/occupational questionnaire, after formal permission of public hospitals from the North of Portugal. Nurses participated voluntarily and anonymously.

Results and Discussion: High values of Engagement and Presentism were found, using Kopman's global score of Presentism as being able to work adequately despite being ill. However, negative dimension of Presentism (Avoid Distraction) presents moderate values already. Engagement dimensions present a positive correlation with Presentism, explaining 17% of presentism. Job experience presents positive correlation with Presentism and negative one with Avoid Distraction. Nurses working by fixed shifts presented higher engagement than those working by rotated shifts.

Conclusions: Despite health risks associated with sickness presentism varied according each disease or worker, on nursing contexts it can prejudice caregiving (Aronsson, & Gustafsson, 2005). However, job motivation and engagement can help to reduce presentism (Brborovic et al., 2017; Yang et al., 2018).

Keywords: Presentism; Engagement; Correlational Study; Nurses.

- 16980 | "Xplore: Get Real!": Proposal of a serious videogame for vocational exploration.

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Juvenile delinquency and early school leaving remain a matter of concern in our country. Despite the numbers associated with juvenile crime maintaining a downward trend since 2015, this issue continues to merit attention from researchers. The same applies to early school leaving, since the national average remains higher than that of the European Union. Thus, the main objective of this study is to design an instrument of vocational exploration in the format of a serious video game, having as theoretical inspiration the self-determination theory, the Flow theory, the Reconstructive exploration of vocational investments model and the integrated cognitive-motivational model of conceptualization and evaluation of interests. It also integrates aspects extracted from vocational intervention programs and games that have been designed with the aim of the product that is outlined in this work: to involve young people in exploiting their interests in the perspective of investment in personally motivative training/professional goals. Assuming the designation Xplore, it is a simulation game that, seeking to balance the player's abilities and the difficulty of the task, will allow the young man to explore multiple possibilities of professional achievement, through the access to the frequency of the educational/formative system, which is a fundamental requirement.

Keywords: Juvenile Delinquency, School Dropout, Early School Leaving, Serious Game, Vocational Orientation, Career Guidance, Vocational Exploration

- **16982 | Microplastics contamination in aquatic organisms from the Atlantic Ocean (Madeira Islands region) and human exposure through seafood consumption – preliminary results**

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Presently, contamination of wild marine species by microplastics (MP) is a key issue reflecting the alarming environmental impacts and the possible consequences on human health. In this context, the present study documents the contamination by MP of several species caught in the Madeira island system (NE Atlantic Ocean). Organisms were obtained from the commercial fleet and research cruises. Internal organs and various tissues were separated and analysed. Particular attention was paid to muscle for being the main tissue consumed by humans. Plastic debris were extracted and the preliminary identified MP were separated from other debris. Before quantification, MP veracity was confirmed by its morphology. MP was present in internal organs and tissues of the analysed species. Preliminary results indicate that fibres and fragments were common MP shapes and presented different colours. Human exposure to MP via marine food ingestion was determined by multiplying average quantity of MP in muscle tissue of the studied species by the recommended weekly dose of fish consumption proposed by the European Food Safety Authority. Ongoing research will allow assessing the relevance of this contribution to the whole budget.

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- 16984 | Screening of novel compounds in pairs of drug-sensitive and multidrug resistant counterpart human tumor cell lines: identifying multidrug resistance inhibitors

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Multidrug resistance (MDR) occurs in tumor cells that develop cross-resistance to drugs structurally and functionally unrelated. The most frequent causes of MDR are: i) decreased drug-influx, ii) increased drug-efflux, iii) increased DNA damage repair, iv) deregulation of cell death pathways, v) alterations in cellular metabolism, vi) epigenetic alterations and vii) deregulation of microRNAs. MDR is one of the main limitations of successful cancer treatment and new drugs to counteract MDR are necessary. Screening compounds using pairs of drug-sensitive and MDR counterpart human tumor cell lines may identify MDR reversing compounds. This will be possible by comparing the GI50 values (concentration that inhibits 50% of cell growth) of each compound in these pairs of cell lines.

The main aims of the present work are to: i) screen new compounds with promising MDR inhibitory capacities, for cell growth inhibition in pairs of drug-sensitive and MDR human tumor cell lines; ii) study the mechanism of action of the most potent compounds in MDR tumor cells.

With that purpose, the screening of a series of compounds in pairs of drug-sensitive and MDR human tumor cell lines will be carried out with the sulforhodamine B or the resazurin assay. The most promising compounds will be further studied regarding their effect on cell cycle profile (by flow cytometry following propidium iodide [PI] labelling) and on programmed cell death (by flow cytometry following Annexin/PI labelling). Preliminary results will be presented.

- **16985 | Generation of a LRP1B-Knockout Glioblastoma Cell Line Model via CRISPR/Cas9**

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The LDL Receptor-Related Protein 1B (LRP1B) is a member of the Low-Density Lipoprotein Receptor (LDLR) family which includes several structurally homologous cell surface receptors with diverse biological functions from cargo transport to cellular signaling. LRP1B inactivation by either chromosomal, epigenetic or microRNA-mediated mechanisms has been reported in multiple types of malignant tumors with LRP1B being proposed as tumor suppressor. LRP1B binds several ligands activating extracellular proteolytic cascades and regulating adhesion, motility and invasion. Also, its endocytic activity may have clinical impact and contribute to resistance to liposomal therapies. Nevertheless, LRP1B dysfunction's role in cancer remains unclear. Mostly, knowledge is based in the cellular overexpression of LRP1B soluble ectodomains or minireceptors (expressing only part of LRP1B). Although extremely useful, these approaches may underestimate the full potential of LRP1B activity.

Thus, the aim of our ongoing work is to establish and characterize CRISPR/Cas9-induced LRP1B-knockout in a glioblastoma cell line. For this, four single guide RNAs (sgRNAs) were designed to target different LRP1B exons. Each sgRNA was cloned into pSpCas9(BB)-2A-Puro V2.0 plasmid and Sanger sequencing-verified. CRISPR plasmids were transfected into U-87 glioblastoma cells using Lipofectamine 3000. After puromycin selection, single-cell clones were isolated from the selected pool using limiting dilution.

The next step will consist in the expansion of the clonal populations to confirm LRP1B silencing and to further characterize these cells.

This work will allow the development of LRP1B-knockout models of utmost importance for the study of LRP1B's role in cell biology.

Acknowledgements

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- 16988 | Which are the impacts of using drainage from a hydroponic system on lettuce (*Lactuca sativa*) cultivation?

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Agriculture's sustainable production systems are closely related to the efficient use of water, fertilizers and phytopharmaceutical products (PPPs). The implementation of closed and semi-open irrigation systems in hydroponic production of horticultural crops, would highly contribute to a lower environmental impact. However, in order to infer on the potential reuse of the drainages it is important to assess the effect of their reutilization on crops.

This study is part of the AgriNuPes project which aims at developing NPK sensors and biosensors to detect PPPs residues in drainages, to increase the efficiency of water use, reduce soil/water pollution and maximize recirculation of nutrient solution. Two trials were performed, consisting in growing lettuce (*Lactuca sativa*) in hydroponics and soil. Plants were subject to four treatments consisting in different percentages of drainage (100%, 50%, 25% and 0%) completed with fresh nutrient solution. Also, ecotoxicological assays using standard protocols were performed, exposing model organisms (*Aliivibrio fischeri* and *Raphidocelis subcapitata*) to the drainage and soil used in the trials.

The results showed no significant differences on the assessed parameters, fresh weight (FW), dry weight (DW), leaf area (LA), and head diameter (HD), between the low (25% drainage) and medium drainage (50% drainage) treatments compared with the control (0%). High drainage (100%) treatment significantly decreased FW (-35,5%), LA (-40,7%) and HD (-20,0%). In the soil trial, no effect was found for the incorporation of drainage compared with the control, for any assessed parameters. Concerning the ecotoxicological assays, the drainages showed to be non-toxic to *A. fischeri*, but high toxicity was found for the soil elutriates, using *R. subcapitata* (EC50 = 20.6%).

In general, the results suggest good prospects for hydroponic cultivation of lettuce with high percentage of drainages without affecting yield.

- 16989 | Iodine knowledge among Portuguese pregnant women: results from the IoMum cohort study

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Introduction: Maternal iodine intake is essential for normal fetal growth and neurodevelopment. Evidence on iodine knowledge among Portuguese pregnant women is inexistent.

Aim: To investigate the knowledge on iodine importance and food sources amongst pregnant women, and to determine if there is an association between iodine knowledge and iodine intake.

Methods: 548 pregnant women attending their 1st trimester ultrasound scan at Sao Joao Hospital Center were invited to participate. After applying inclusion (gestational age between 10 and 14 weeks, confirmed fetal vitality and signed informed consent) and exclusion criteria (levothyroxine intake), 485 participants were obtained. A questionnaire was applied to all participants. Besides demographic and lifestyle information, the questionnaire also included four questions related to iodine knowledge. A scale of knowledge was developed based on a scoring system (ranged from 0 to 10 points) and four categories of knowledge were created. Multiple linear regression models were used to analyse the association of iodine knowledge with iodine intake.

Results: 359 (79.2%) participants showed none to low knowledge about iodine (0 to 4 points on the global knowledge scale). Regarding partial scores, 252 (53.8%) participants knew about the importance of iodine during pregnancy (2 out of 2 points), 296 (64.6%) had low knowledge (2 out of 4 points) about iodine food sources and 335 (70.4%) showed no knowledge (0 out of 4 points) about iodised salt. Being aware of the importance of iodine was the only category of knowledge relevant for iodine consumption since the participants who had this awareness had better iodine status as measured by UIC (urinary iodine concentration) ($p=0.024$).

Conclusion: This study evidences that pregnant women of the IoMum cohort have low knowledge about iodine which may negatively affect their iodine intake, eventually promoting iodine deficiency during pregnancy.

- 16990 | Potential of lost fishing gears for adsorption of inorganic compounds:
Hotspots characterization

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Marine litter drifting in the oceans pose a major threat to marine ecosystems from an ecological and socioeconomic point of view. Fishing waste has been commonly detected in the ocean causing global concern. Since the 1980s, fishing gears have been classified as a global problem. It is estimated that worldwide lost fishing gear comprises a significant amount of plastic pollution, around 64.000 tonnes and around 20% of UE fishing gears is lost and/or discarded. This work is integrated in the NetTag project which aims, among other goals, to understand the environmental harmfulness of lost fishing gear. In this work, we evaluated the potential of lost fishing gear to adsorb inorganic pollutants, investigating the environmental harmfulness of lost gear as a pollutant sink. For that, two locations where lost fishing nets are concentrated along the NW Portuguese coast, one in Matosinhos and another in Esposende, are being analyzed in terms of metal concentration in the nearby water particulate matter and sediments. The first results of the characterization of surrounding water and sediments of the two sites showed that metals (Zn, Pb, Cr, Cu, Fe, Mn, Cd, Ni) levels in water particulate matter at the two selected sites were below the detection limits in most cases. Metals levels in collected sediments were in general also low and similar to those commonly found along the north Portuguese coast. The potential of lost fishing nets to adsorb metals is currently under test with laboratorial experimental assays, taking into account the role of environmental drivers, namely hydrodynamics, metal concentration, and polymer type.

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- **16993 | Determinants of body image perception in adolescence: a multilevel approach**

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Body image dissatisfaction is an increasing problem specially among adolescents. To fully understand the body image perceptions and misperceptions, we need a multilevel approach, considering not only individual and familiar characteristics but also the school characteristics, since this setting has a strong effect on the social and psychological development of adolescents. This study aims to understand the role of the environment in the body image perception, namely the role of school environment and find out if the effect of school depends on the adolescent's gender and age.

This work is part of the EPITeen cohort study, that included adolescents born in 1990 enrolled in 27 public and 19 private schools of Porto. Participants were evaluated at 13 years old ($n=1382$) and at 17 years old ($n=2331$). The Ethics Committee of the "Hospital de São João" in Porto approved both evaluations.

Self-reported questionnaires were used to collect data on sociodemographic characteristics, lifestyles, eating behaviors, health characteristics of adolescents and their parents' information. Weight and height were measured using the same procedures at both waves. The Stunkard figures were used to evaluate body image perception and body image discrepancy. The Eating disorders index (EDI) was used to evaluate eating disorders. A multilevel analysis will be used considering three levels of information: individual, family and school.

Preobesity or obesity prevalence was 28.7% at 13 while at 17 was 21.5%, at both ages higher in females. The discrepancy between Stunkard images was 0.0(1.0) in both ages but the total EDI score was 30.1(23.7) at 13 and 26.0(22.0) at 17. Besides, in both waves, the prevalence of preobesity and obesity is higher in public schools than in private ones. The EDI level of public schools is higher than in private ones in both waves.

This preliminary analysis confirms that the age, sex and school characteristics may condition the perception of the adolescent's body image.

- 16994 | Search for coliphages in freshwater, macroalgal biofilm and marine pool water

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Viruses are entities ubiquitous in very high abundances in all Earth ecosystems. In particular, viruses that infect *Escherichia coli* are designated coliphages and associated with faecal contamination from anthropogenic or animal sources.

The aim of this study was to detect coliphages in various waterborne environments namely, a stream nearby populated areas, a pool in a beach in Porto coastline and the biofilm community of macroalgae.

The different waters and macroalgae were sampled and brought to the laboratory. The macroalgae were scratched for biofilm removal and the material suspended in 35.6 mL of distilled water to which 4 mL 10 X TSB and 0.4 mL of *E. coli* culture were added. From the water samples, 35.6 mL were used directly and treated as above. After 24 h incubation at 37°C, 1 mL was centrifuged and serial dilutions up to 10⁻⁶ were prepared. From each dilution, 100 µL were inoculated in 3 mL TSA top plus 100 µL of fresh *E. coli* culture and the mixture placed over a TSA medium in a plate. After 24h at 37°C, the appearance of viral plaques was screened for. For coliphage isolation, different plaques were removed and incubated in phage buffer during 2h at 37°C. Another serial dilution was performed and 100 µL aliquots were inoculated as above. This procedure was repeated until only one type of plaque was obtained. At this point, the isolation procedure was repeated and 2 mL of phage buffer were added to TSA plates covered with viral plaques (plate lysates) and incubated overnight at room temperature. After incubation, the buffer was removed and centrifuged (5000 rpm; 25 minutes) and supernatant mixed with glycerol (50%) and stored at -80°C.

Several coliphages were isolated from both fresh and marine waters. As up to now, no coliphages were obtained from the biofilm of macroalgae, new attempts will be made.

Our results showed the presence of coliphages in different waters with diverse anthropogenic impact.

- **16998 | Nutritional and Body Composition Assessment in patients with Bronchiectasis**

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INTRODUCTION

Bronchiectasis is a respiratory disease characterized by irreversible bronchial dilation, associated with a circle of inflammation, infection and bronchial injury. Increased susceptibility to respiratory infections, chronic inflammatory condition, and catabolic status may result in changes in body composition and nutritional status.

OBJECTIVE

To study the relationships of clinical characteristics, nutritional status and body composition with disease severity (DS) among patients with non-cystic fibrosis bronchiectasis.

METHODS

Anthropometric and body composition assessment were performed by bioimpedance, with subsequent calculation of phase angle (PA), among 56 outpatients (60.7% women; 18 to 81 years) attending a follow-up bronchiectasis appointment in a central hospital. DS was assessed using Bronchiectasis Severity Index (BSI) and FACED.

RESULTS

According to a classification suitable for chronic respiratory diseases (Nutrition Screening Initiative of the American Academy of Family Physicians and American Dietetic Association), 35.3% of women and 22.7% of men were thin, 44.1% of women and 27.3% of men had normal weight and 20.6% of women and 50.0% of men were obese. Median PA was significantly higher among males (5.57 ° vs. 4.81 °; $p = 0.002$). The biological and diagnostic age were positively associated with DS, both among females ($r = 0.648$, $p = 0.001$; $r = 0.473$, $p = 0.005$) and males ($r = 0.479$, $p = 0.024$; $r = 0.468$, $p = 0.028$). Among males a positive association was observed between the percentage of fat mass and DS, while among females lower PA was associated with higher DS.

CONCLUSIONS

Due to the pathophysiology of bronchiectasis, which may differ regarding effects on body cell mass, hydration and maintenance of cellular integrity, it would be important to study the prognostic value of PA in these patients. In addition to assessing nutritional status, PA seems to be a likely indicator of DS.

KEYWORDS: Bronchiectasis; Body composition; Phase angle.

- 16999 | Does Urocortin-2 induce changes in neurogenesis of the hippocampal formation of rats?

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Evidence shows that patients with heart failure are at a greater risk for brain structural and functional changes leading to cognitive impairment. Urocortin-2 (UCN2) may revert many of the deleterious processes implicated in the pathophysiology of heart failure with preserved ejection fraction(HFpEF). It is still unknown the role of UCN2 in the CNS of HFpEF rats. The present study aimed to examine the effect of chronic UCN2 treatment on neurogenesis in the hippocampal formation(HF).

The study was carried out in 20-week old male rats with HFpEF obtained from an animal colony of Zucker Diabetic Fatty Obese rats and in age-matched controls. Half of the animals were chronically treated with UCN2 during 5 weeks and then perfused with 4% formaldehyde. The brains were removed and sectioned for immunohistochemistry with doublecortin(DCX) antibody. Sections containing HF were analyzed using a light microscope equipped with a camera lucida at final magnification of 100x. A set of 10 sections were analyzed and DCX- perikarya were drawn unilaterally. These drawings were used for the measurement of the area of the layers using a transparent sheet bearing a test system composed of a set of regularly spaced points. Obtained cell counts were divided by the values of the corresponding laminar areas to yield the values of the areal densities (number/ μm^2).

Our results showed that DCX-ir neurons increased significantly in controls treated with UCN2($p<0.001$) compared to the untreated control group. Both obese groups showed an increase in DCX-ir compared to untreated control rats($p<0.01$). Although there was an increase in the density of DCX-ir in both treated and untreated obese rat groups, the density was similar to controls treated with UCN2.

The results obtained so far seem to indicate that treatment with UCN2 may in fact modulate neurogenesis in hippocampus in a model of HFpEF. Nevertheless, experiments should be carried out to better understand the pathways involved in this process.

- 17001 | The Use of Second-Person Singular Personal Pronouns for a Familiar, Friendly or Intimate Approach in Brazilian Popular Songs.
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With the general goal of creating and developing scientific research in Applied Linguistics to instrumentalize inclusion policies that minimize the tensions of human relations between people who speak variants of Portuguese, it was specifically sought to analyze the variation in progress that has been happening in Brazil. For this purpose, through documentary research, it was investigated: a) how the use of "tu" - second-person singular personal pronoun in Portuguese - is manifested in famous song lyrics from Brazil; and b) how the use of "você" - second-person singular personal pronoun in Portuguese - is manifested in famous song lyrics from Brazil. Practices and identity outlined the focus of the investigation. Special attention was also paid to the way these two pronouns are manifested in the Brazilian social identity. First, a theoretical framework was established to define the dimensions that characterize the uses of the personal pronoun. Then, a qualitative research method known as document analysis was used due to the nature of the data collection composed of song lyrics, accompanied by bibliographic research. Two hypotheses were tested. Hypothesis 1: the decline in Brazil in the use of the personal pronoun "tu" - second-person singular in Portuguese - has a significant relationship with the arrival of non-Portuguese-speaking immigrants in the city of Sao Paulo. Hypothesis 2: the decline in Brazil in the use of the personal pronoun "tu" - second-person singular in Portuguese - has a significant relationship with the economic and political growth of the city of Sao Paulo. It was conclusive that Noel Rosa, one of the most important music artists in Brazil, namely for the legitimation of samba, influenced generations of song writers with his legacy of songs, and by doing so contributed to the change of the pronominal paradigm of the second-person singular in Portuguese, in Brazil, as he was the first major artist to record "você" with an equivalent sense to "tu".

- **17002 | CREATING NICHE FILM COMMUNITIES: THE A24 CASE**

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Created in 2013, the independent movie studio and distributor A24 succeeded at becoming an esteemed author label and creating a fan community around a distinct brand identity since its establishment. The company's portfolio has an explicit curatorial voice, targeting a niche of young movie-goers who aren't overwhelmed by big franchises or mass media consumption and want to engage in experiences that overcome the regular theater event. Beyond releasing films and TV series that resonate with this audience's current conflicts, A24 produces several directorial debuts, giving opportunity to filmmakers in the same age group who would hardly break into the business in a conventional way. In response, not only this target audience attend the screenings, but they've built a community to support authors and consume the studio's podcasts, zines and merchandise products as a collective experience.

This research aims to investigate A24, between 2015 and 2018, and analyze its participation at the american independent film market, specially the box office sales and its contributions to film marketing in the digital era.

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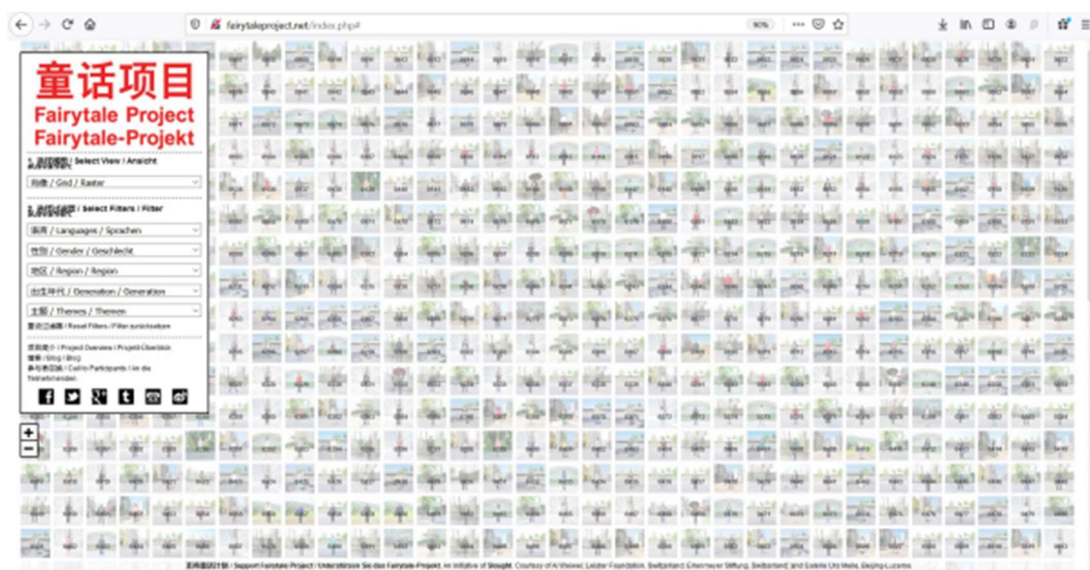
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- 17003 | AI WEIWEI'S FAIRYTALE: SOCIAL MEDIA AND THE POTENTIALITIES OF ENCOUNTERS

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Chinese artist Ai Weiwei always tested the limits of art itself, and his immersion in the blogosphere brought a new light in the way he addresses issues important to him (freedom of speech, subjectivity, tensions between the traditional and the contemporary, east and west, etc). Weiwei's work ranges from books, architecture, visual arts, documentaries and also includes his presence in social media, as he admitted his blog is considered part of his body of work. Weiwei used the blog's new possibilities not just as a form of personal diary, where he documented his life and opinions, but also as a means to produce his art, by replicating these new forms of virtual social patterns in "real" life, allowing distances to be shortened and new encounters to arise. Social media, and specifically the blog in Weiwei's case, create a new type of social dynamics: no longer directed, one-way dialogues, but instead open-ended interactions, subjected to multiple replications with indefinite repercussions, being impossible to measure their direct consequences. Hence, it is intended to describe the new forms of socialization that emerge with new media, as well as point out these patterns applied in Weiwei's work, focusing on Fairytale - a project where the artist, through an open call in his blog, brought 1001 people from China to a contemporary art event in Kassel, Germany, where people were, simultaneously, objects and subjects of art, being impossible for the artist to predict or control the outback of his artwork. Weiwei's work, already bold and controversial, has blurred the limits between virtual and real, and thus gained another level of complexity by the potentialities of the internet and its encounters.



Fairytale: the project

- 17004 | Ascorbate improves the performance of antioxidant system in tomato plants exposed to NiO nanomaterials – an in vitro approach

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Nanomaterials (NMs) have several applications and their development has resulted in increased emissions to the environment, where they can accumulate and pose a risk to various organisms. Due to their sessile nature and direct dependence on the soil, plants are particularly exposed to all types of contaminants, including NMs. Thus, it is necessary to develop new sustainable and efficient tools to increase plant tolerance to these contaminants. In this way, this study aimed to evaluate the phytotoxicity of nickel oxide NMs (nano-NiO) on *Solanum lycopersicum* L. growth under *in vitro* conditions, as well as to test the efficiency of ascorbic acid (AsA) in increasing tolerance to nano-NiO. For this purpose, seeds of *S. lycopersicum* cv. Micro-Tom were cultured in half-strength MS medium supplemented with 30 mg/L of nano-NiO and, in another situation, in addition to NMs, 150 mg/L of AsA were added. After 19 days of growth, plantlets were collected and used for the evaluation of non-enzymatic (glutathione, proline, AsA, phenolic compounds) and enzymatic (superoxide dismutase - SOD, catalase - CAT) antioxidant (AOX) defense mechanisms. The results showed that the performance of the different AOX, both enzymatic and non-enzymatic, allowed the removal of excess ROS, reducing the degree of oxidative stress induced by the presence of nano-NiO. It should also be noted that the addition of AsA increased the total AOX capacity of cells, stimulating the accumulation of glutathione and phenolic compounds, and activating the SOD enzyme, in order to minimize the oxidative damage caused by excess nano-NiO. Thus, overall, data pointed towards a protection role of AsA in increasing the tolerance of the plant species to this emerging contaminant, by modulating plant antioxidant defense pathways.

- 17007 | Phytopathogenic *Pseudomonas* spp. susceptibility against copper treatment and action mechanisms.

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Pseudomonas syringae pv. *actinidiae* (Psa) is the causative agent of bacterial cancer in different kiwi species and leads to high economic losses. There isn't a currently effective treatment against Psa, and existing means are only essentially preventive measures. These include different types of pesticides such as copper based agrochemicals and antibiotics. However, their use in agriculture should be avoided because of their danger. This study aims to evaluate the susceptibility of Psa isolates (from Douro and Minho kiwi orchards in 2013) to new versus old copper based agrochemicals.

Thus, four isolates of Psa (biovar 3) and, in addition, *P. viridiflava*, *P. syringae* pv. *syringae* and *P. cerasi* were selected for this study. Therefore, besides the phenotype characterization, the susceptibility of *Pseudomonas* spp. will be analyzed through growth curves, determining the minimum inhibitory concentration. Cell viability and effects on genomic DNA will be assessed by flow cytometry and the response of metabolism-associated transcripts involved in susceptibility/resistance will be determined by PCR techniques.

The minimum inhibitory concentration of the studied strains ranged from 15 to 30 µg / mL, being the isolates P85 and Am63 the most susceptible to copper sulfate. Moreover, at concentrations of 125 µg / mL this compound has been shown to have bactericidal action for P84 and P85 isolates, and to have bacteriostatic action for Am63 and Al13.

A similar study will be made with the commercial copper-based formulation (Nordox™), which then will allow them to compare with the response of these isolates to various synthetic antimicrobial peptides. These results will allow to evaluate the degree of copper resistance of the isolates, and to initiate studies for potential sustainable alternatives of control of these phytopathogenic agents

- **17009 | Impact of exercise on quality of life, body composition and functional capacity in patients with head-neck cancer. Systematic review and meta-analysis**

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Introduction: The treatment of patients with head and neck cancer is associated with loss of body mass, accompanied by reduction of the functional capacity and quality of life.

Objective: Evaluate the impact of a physical exercise program to improve the quality of life, body composition and functional capacity in patients with head and neck cancer.

Material and Methods: A research was performed in Pubmed, Web of Science and Google Academic databases between July and March of 2019. The meta-analysis was executed with the Review Manager 5.1 software, using the average difference and the confidence interval of 95% (IC), following the PRISMA guidelines.

Results: 15 studies were selected, with an average age of 56.85 years. Cumulative analysis shows that the intervention with physical exercises improved an overall quality of life assessed by the scale EORTC QLQ 30 (average difference=11.15, IC 95%, 8.52-13.78; $p<0.00001$; $I^2=0\%$), but not when using the FACT-G scale (average difference=2.22, IC 95%, -1.99-6.44; $p=0.30$; $I^2=0\%$) or FACT H&N (average difference=-1.96, IC 95%, -10.94-7.01; $p=0.67$; $I^2=0\%$). Observing the physical dimension (average difference=7.21, IC 95% [3.86; 10.56]; $p<0.00001$; $I^2=90\%$) and mental dimension (average difference=14.86, IC 95% [7.47; 22.26]; $p<0.00001$; $I^2=94\%$), evaluated by SF-36, both significantly improved with the intervention. It was found that physical exercise increased the lean mass about 0.92 kg (IC 95%, 0.17-1.67; $p=0.02$; $I^2=9\%$), not changing the fat mass (average difference=0.50, IC 95%, -1.15-2.15; $p=0.55$; $I^2=0\%$) or the Body Mass Index (average difference=0.32, IC 95%, 0.42-1.06; $p=0.40$; $I^2=0\%$). The functional capacity showed a non-significant increase in the performance of the Sit and Rise test (average difference =82.82, IC 95% [46.67,118.98]; $p<0.00001$; $I^2=87\%$).

Conclusion: The results from this review support the adjuvant role of exercise in the treatment of patients with head and neck cancer.

- **17011 | Optimization of Glutathione S-transferase P1 inhibition assays in batch mode**

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Glutathione S-transferases (GST) is one of the most important families of detoxifying enzymes and they are also involved in multidrug-resistance development in tumors. These enzymes catalyse the conjugation of glutathione (GSH) that leads to inactivation of several electrophile-producing anticancer agents. So, GST family play an important role in anticancer drug mechanism [1].

Ionic liquids (ILs) are typically defined as organic salts with melting points below 100°C. Moreover, they present high thermal and chemical stability, high ionic conductivity, low flammability, low volatility and high aqueous solubility [2]. The development of new anticancer agents with lower toxicity and that can escape to tumor resistance mechanisms is one of the main goals in the pharmaceutical field. There are some studies of the effect of ILs as anticancer agents that have brought new perspectives to the use of these compounds [3].

In this work, it was optimized a batch assay to determine the enzyme activity of a GST P1-1 in presence of some ionic liquids and ethacrynic acid (EA) (reference inhibitor).

The effects of several parameters on the reactions were tested, such as reagents concentration, temperature, addition order and reaction time. The best results were selected in order to get accuracy and reproducibility in the execution of the enzymatic assay.

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Acknowledgments:

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- **17015 | Development of a chromatographic method for evaluation of uremic solutes in biological samples**

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Chronic kidney disease (CKD) is a global health problem, with 6-10% of world adult population having CKD in its different stages [1]. With the progressive loss in renal function there is an accumulation of organic waste products, in particular derivatives of nitrogen metabolism, which are normally cleared by the kidneys. In recent years there has been an increasing interest in the identification of these uremic toxins that may be inefficiently removed by dialysis, despite the advances in renal replacement therapies [2]. Moreover, uremic toxins of microbial origin, produced by gut microbiota, may alter the pathophysiology of CKD. Therefore, it is essential to be able to easily monitor their concentrations in biological samples of CKD patients.

Currently, there are no easily accessible methods to determine p-cresol, indoxyl sulfate, indole acetic acid, and p-cresol sulfate simultaneously. Hence, the aim of this work was the development of a simple, rapid and sensitive method to quantify these uremic solutes in biological samples of CKD patients by high-performance liquid chromatographic coupled to fluorimetric detection.

Chromatographic separation was achieved using a reversed phase monolithic C18 column (Chromolith RP-18e, 100 mm × 4.6 mm i.d., Merck). Several parameters were studied, including the flow rate (up to 4 mL min⁻¹) and the composition of the mobile phase (using phosphate buffer as aqueous phase and acetonitrile as organic modifier), under isocratic or gradient elution modes. After establishing the conditions suitable for separation and quantification of all analytes, the method was validated for selectivity, linearity and range, accuracy, precision, detection and quantification limits (LOD and LOQ), stability, matrix effect and recovery, providing results suitable for its application to the targeted samples.

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- 17016 | Human Bitter Taste Receptors Expression in *Saccharomyces cerevisiae* for functional studies

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Bitterness is one of the five basic tastes that humans can perceive by activation of bitter taste receptors localized in the surface of taste cells. These proteins are G protein-coupled receptors, encoded by TASTE 2 Receptor (TAS2R) gene family which comprises 25 apparently functional genes. Despite bitterness is usually related to avoid the intake of potentially poisonous foodstuffs, some healthy foodstuffs are also perceived as bitter. In fact, polyphenols, a family of compounds widespread in plant-based foodstuffs with a well-known healthy properties, have been already identified as agonists for some TAS2Rs, namely, TAS2R5, TAS2R7 and TAS2R39. Given the few studies that have investigated the structure-function association of these receptors, the aim of this study was to clone, transform, express and isolate TAS2R5, TAS2R7 and TAS2R39 on *S. cerevisiae* for further interaction studies. For this purpose, these three bitter taste receptors were expressed using a GFP-fusion yeast system in which the transformants and the induction culture conditions (time, temperature and addition of a chemical chaperone) were screened by measuring GFP fluorescence by Whole-cell GFP fluorescence, Immunoblotting and Fluorescence microscopy. Isolation of TAS2R was performed by detergent solubilization with 1% n-dodecyl- β -D-maltopyranoside (DDM) and 0.2% cholesteryl hemisuccinate (CHS)[3]. An increase of expression of TAS2R5 and TAS2R39 was observed when these receptors were induced with 20% of galactose for 22 h, a 20°C at 140 rpm. While on TAS2R7, an increase in its expression was observed when the receptor was induced with 20% of galactose and 2.5% of DMSO for 22h, a 26°C at 140 rpm. Isolation of TAS2R has been proven difficult, once it presented some problems on cell lysis efficiency and maintaining protein stabilization. This study allowed to establish protein expression for these three TAS2Rs. The ongoing work is focused on improving the approach to isolate these membrane proteins.

- **17024 | Finding Plant Specific Insert (PSI) interactors using the Y2H system**

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In plant cells, the conventional route to the vacuole involves the endoplasmic reticulum, the Golgi and the prevacuolar compartment. However, a more unconventional sorting route to the vacuole, bypassing the Golgi, has been described in recent years, and is frequently associated with stress conditions and organs with high metabolism. Cardosin A Plant Specific Insert - PSI - is an example of a vacuolar sorting determinant driving proteins through this pathway. The PSI is found in some plant aspartic proteinases and comprises a region of approximately 100 aminoacids. Based on PSI properties and in order to start unravelling the intervenients in this unconventional pathway, we tested the interaction of cardosins' PSI with several putative candidates localized in different compartments of the endomembrane system. The interaction ability was tested, in a first step using the yeast-two-hybrid system (Y2H) system and confirmed by biochemical methods and co-localization strategies. Preliminary results point to the interaction of cardosin A PSI with the syntaxin SYP21, the vacuolar sorting receptor VSR3 and the exocyst component EXO70, frequently associated with unconventional trafficking events. Interestingly, cardosin B PSI (this one following the classical vacuole route) does not interact with the same markers as cardosin A PSI. Further studies will allow validation of the interactions obtained and to start mapping PSIs interactions network.

- **17029 | Knickpoints and Knickzones along the rivers of Alvão Mountain: detection and geointerpretation**

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Knickpoints are sectors of the riverbed whose slope is much higher than the previous segment (Hayakawa & Oguchi, 2006), portraying one (or many) step(s) by observing the longitudinal profile of a watercourse. If these characteristics take place repeatedly along the riverbed, a Knickzone (Kzn) is defined. Usually, throughout the Kzn there are spectacular geomorphological features such as rapids, cascades, waterfalls and river captures.

Traditionally, the identification of these sections along watercourses is done by fieldwork or analysing the river longitudinal profile and the variation of the bed slope. These methods are time consuming as they require data processing and the analysis of data for each watercourse. Currently, by calculating automatically the normalized channel slope index (ksn), it is possible to identify sudden changes along the slope of the watercourses. This index is easily applied for an entire digital elevation model (DEM) allowing the quick analysis of an entire study area.

In this work, we used ksn to identify these geomorphological features in Serra do Alvão, Portugal. The index was calculated in MATLAB using a 30-meter resolution DEM. After a detailed analysis of the segments with high ksn values, it was possible to identify 11 main Kzn areas along the network drainage. Using Google Earth, it was possible to identify 7 waterfalls/rapids and 5 river captures. Already known Kzn areas, such as the Físgas do Ermelo and the Poio waterfalls, confirm the validity of the methodology used that points to the same conclusion.

This methodology proved to be very useful for its speed and easiness of use. The achieved results can support the environmental, scientific and touristic value of the territory, encouraging sports and geotourism, as well as the preservation of these priceless landscapes.

Hayakawa, Y. S., & Oguchi, T. (2006). DEM-based identification of fluvial knickzones and its application to Japanese mountain rivers. *Geomorphology*, 78(1-2), 90-10

- 17030 | The behaviour of free-roaming cats, *Felis silvestris catus*, in two colonies located in Porto

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In urban areas the number of free-roaming cats is very high and therefore there has been a public and institutional awareness toward the potential problems of free-roaming cats in the urban environment (health, security issues and human-animal conflicts). Increasing efforts are being implemented, such as cat sterilization campaigns to aim the reduction of the reproductive potential, and other to convince the population that they shouldn't be fed, otherwise they'll settle down and the number of the colony will increase.

As cats adapt their behaviour depending on the amount of food and its source, reproduction opportunities, environmental conditions and available shelters, two big colonies are being monitored in Porto's urban environment. One of the focus of his monitoring program is the analysis of free-roaming cat behaviour. With a monthly periodicity cat behaviour is recorded in three periods (morning, afternoon and night) in order to elaborate a catalogue of free-roaming cat behaviour (solitary and social).

Although the study as just began, we can already present a short behaviour catalogue, being also evident that both solitary and social cat behaviours are stimulated by several environmental factors, such as the daily light cycle, food supply and weather conditions.

We expect that as the study develops we will be able to obtain a significant cat catalogue, both for solitary and a social behaviours, as well as to better understand the role of the different environmental factors for the daily and seasonal cat needs and activities.

- **17035 | Benign Thyroid Disease and Thyroid Cancer Risk**

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It is estimated that 3 to 7% of the healthy population have palpable thyroid nodules (1) and about 60% have ultrasound-detectable nodules (2). Thyroid fine needle aspiration (FNAB) puncture under ultrasound control is considered the method of choice in assessing the risk of thyroid nodule malignancy (2, 3), with a sensitivity of 88 to 97% (2). Thus, patients with benign thyroid pathology have traditionally been followed for several years and submitted to subsequent biopsies based on nodular growth (4). The objective of this study was to describe and quantify the predictive value of the results of ultrasound-guided thyroid biopsy biopsies performed at the Portuguese Institute of Oncology of Porto (IPO-Porto) in the period 2013-2014. For each PAAF performed, the respective pathological anatomy report was consulted, and information was collected on the classification and subclassification of the biopsy result according to the Bethesda classification (3). Sample size estimates were made to meet the objectives. It is estimated that a sample of around 400 participants allows estimating cumulative incidences of up to 7% with a confidence interval of 95% with a range of 6% and estimating negative predictive values between 90 and 95% with a confidence interval of 95 %. % with an amplitude of 10%.

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- 17037 | Para swimmers velocity profile

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Knowing the velocity profile of a swimmer allows training him/her more specifically. This is something already performed in different swimming age-groups, but not being so evident in para swimming. The study aims to analyse the velocity profile of disable swimmers and comparing it with able-body swimmers profiles. Seven competitive para swimmers (23.1 ± 4.7 years old) performed a 25 m maximum front crawl bout attached to a speedometer. Starts were performed in water. Maximal and mean impulsion speeds (I_{max} and I_{mean}), impulsion velocity slope (I_{slope}), maximal and mean underwater swimming speed (U_{max} and U_{mean}), maximal and mean swimming speed (V_{max} and V_{mean}), fatigue index (FI), variation coefficient of swimming velocity (VC) and the number of swimming cycles (Cy) were measured. The para swimmers related data and the reference values for able-bodied swimmers (minimum and maximum values obtained by our research group in previous data collections) are displayed in table I. No reference values were found for I_{slope} (-5.97 ± 2.05), U_{max} (2.51 ± 0.45) and U_{mean} (1.64 ± 0.20). I_{max} , I_{mean} and V_{max} values attained by para swimmers are within the reference values, and V_{mean} and Cy were lower (as expected). In addition, FI is higher and positive, meaning that a 25 m exertion is enough for para swimmers loose speed, but not for able-bodied swimmers that are able to keep or accelerate during all the distance. CV is higher for the para swimmers, probably due to their more unstable technique that is conditioned by each swimmer disability. As far as we know, this was the first comparison of a velocity profile of para swimmers with able-bodied swimmers. Para swimmers, when compare to able-bodied counterparts, seem to need to improve mean swimming velocity, slow fatigue and stabilize technique. More studies are needed with gender, disability and swimming technique clusters to better define goals for para swimmers training.

Table I. Para swimming velocity profile and able-bodied swimmers reference values

	I_{max} (m.s ⁻¹)	I_{mean} (m.s ⁻¹)	V_{max} (m.s ⁻¹)	V_{mean} (m.s ⁻¹)	FI (%)	VC (%)	Cy
Para Sw	2.98 ± 0.66	1.81 ± 0.40	2.59 ± 0.29	1.69 ± 0.21	0.32 ± 3.35	19.03 ± 3.72	12.71 ± 1.78
Reference	[2.77-3.67]	[1.66-1.97]	[2.52-3.10]	[1.80-2.12]	[(-2.3)-(-13.14)]	[13.68-17.07]	[7.5-11]

- **17040 | Characterization of sediments from Sado estuary**

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Sediments are a sink for the materials that deposit in water bodies. According to this the physical-chemical evaluation must be done apart from the water column. Also, the biological characterization is a vital element in the evaluation of the ecological quality of water bodies. The present study intends to focus on the biological, and physical-chemical characterization of sediments from Sado estuary. AQUASADO project proposes to contribute to the study of the environmental quality of Sado estuary, with the goal of promoting sustainable aquaculture. Sado estuary has a high ecological importance since it holds a natural environmental reserve with high biological richness. In adjacent areas, the estuary receives industries and urban effluents that represent hazards to the estuary biological diversity and water quality. Two sampling campaigns were conducted with sediment collection in 4 sampling sites: SA1 and SA2 under agricultural influence (upstream), and SA4 and SA5 with industrial impact (downstream). Sediments were characterized in terms of texture, pH, organic matter, nutrients and heavy metals. Benthic macroinvertebrates were collected and identified for later application of AMBI index in order to classify the ecological status of Sado estuary. All sediment showed a composition mostly of silt/clay (22-98%) with total organic carbon varying between 0.4-1.8%, being the lowest value recorded in SA4. The highest nutrient concentrations were observed in SA1 with 300mgNO₃/kg and 90mgNH₃/kg, and SA5 with 160mgP/kg. Metals exhibit a tendency of lower values in SA4 (composed by 77% of sand) for metals such as Pb, Cd, Zn, As, Cr, Cu, Ni; while SA5 showed the highest values of Cu, Pb, Zn and As (80% of silt/clay). The benthic macroinvertebrates community showed a high diversity and richness, namely annelids, but also crustaceans and mollusks. The results here-obtained are in agreement with the type of sediment and anthropogenic influences stated in this estuary.

- 17042 | The impact of ionizing radiation on macrophage iron metabolism and on macrophage-cancer cell crosstalk

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Radiotherapy is widely used for cancer treatment. Although the effects of ionizing radiation on cancer cells have been extensively studied, it is also important to understand its impact on tumour-associated host cells and how this influences therapy outcome. Recently, our group demonstrated that exposing monocyte-derived macrophages to ionizing radiation (5 x 2 Gy) increases the expression of the transferrin receptor, a major regulator of iron import. More recently, it has been shown that macrophage polarization dictates different iron metabolism phenotypes. In particular, pro-inflammatory macrophages present an iron retention phenotype, which limits tumour growth, while their anti-inflammatory counterparts exhibit an iron release phenotype, which contributes to cancer cell proliferation and survival.

This project aims at understanding: i) the impact of ionizing radiation on macrophage iron metabolism and ii) how that influences macrophage-mediated cancer cell activities. Firstly, we will validate the increased expression of the transferrin receptor observed in in vitro irradiated macrophages, in tumour sections obtained from biopsies and surgical pieces, collected before and after radiotherapy. In order to determine the macrophage iron-associated phenotype upon irradiation, we will evaluate the expression of iron metabolism-related proteins and measure iron release and retention levels. This will be done using macrophages from irradiated monocultures and macrophage-cancer cell co-cultures. To achieve our second goal, we intend to stimulate cancer cells with conditioned media from irradiated macrophages, previously treated with iron chelators and/or anti-transferrin receptor antibodies. We will then evaluate cancer cell invasion, migration and induction of angiogenesis.

We strongly believe that this project will further elucidate the relevance of iron at the irradiated tumor microenvironment, contributing to the design of adjuvant treatments for radiotherapy.

- 17044 | The relationship between neoadjuvant therapy and functional capacity in patients with esophagogastric cancer: a protocol for systematic review and meta-analysis.

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Introduction: Esophagogastric cancer was in 2016 the sixth most common cause of cancer-related mortality in the world. Neoadjuvant therapy (NAT) improves the survival of patients undergoing surgery for resection or esophageal carcinoma compared to individuals who have just had surgery. However, NAT presents a risk of toxicity and is associated with decreased functional capacity, which has been suggested to influence subsequent clinical outcomes such as delay in subsequent treatment, morbidity, and mortality. Objective: To identify the relationship between NAT and functional capacity of patients with esophageal cancer. Methods: Systematic review and meta-analysis is being designed following Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols. A comprehensive search is currently being performed Cochrane CENTRAL, EBSCO, PubMed, Scopus, and Web of Science data basis, as well as manual search to identify pilot studies, clinical and observational trials that evaluated functional capacity before and after treatment with NAT in patients with esophageal cancer. Two independent reviewers will carry out the searches, study selection (title and abstract and full-text stages), data extraction, risk of bias assessment and evaluation of overall strength of evidence. Meta-analyses will be used for data which demonstrates homogeneity (using Review Manager 5), otherwise, a narrative synthesis will be performed for groups of studies of high heterogeneity ($I^2 > 50\%$). Results: We will assess the overall quality of evidence of the main review outcomes, subgroup and sensitivity analyses. Conclusion: In the end, we hope to definitely clarify the impact of NAT on the functional capacity of esophagogastric cancer patients. In case of functional capacity impairment, and given its relationship with poor clinical outcomes, our data will enlighten future studies testing strategies to recover functional decline before surgery such as prehabilitation with physical exercise.

- 17048 | Influence of uremic toxins on microbial intestinal epithelial barrier translocation in chronic kidney disease

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Chronic kidney disease (CKD) is a general term for disorders affecting kidney structure and function. The progressive loss of renal function leads to the accumulation of uremic toxins, normally cleared by the kidneys. It is under these circumstances that the "uremic state" is established. Recent studies relate uremic plasma to impaired intestinal barrier function and to depletion of the tight junctions (TJs) proteins. Recent studies suggest that intestinal microbiome exert an influence over both the production of uremic toxins and the progression of CKD. In CKD, the impairment of the intestinal barrier function may allow the translocation of microorganisms, endotoxins, antigens and other microbial products from intestinal lumen to systemic circulation, contributing to the pathogenesis of systemic inflammation, cardiovascular risk and progress of CKD. Our main goal was to evaluate the application of two in vitro models of intestinal epithelial barrier for the study of microbial translocation and to evaluate the impact of different uremic conditions present in CKD on this microbial translocation. For that, we analyzed the effect of plasma of CKD patients and the urea on microbial intestinal translocation, as well as on integrity, permeability and localization and quantity of TJs proteins in the in vitro intestinal models, Caco-2 monoculture and Caco-2/HT29-MTX/Raji B triple model. The results showed that the uremic conditions do not potentiate the microbial translocation, although interfere with the integrity and the permeability of intestinal barrier models. Microbial translocation is higher in Caco-2 monoculture than in triple model, suggesting that the triple model creates a more effective intestinal barrier. This study allowed to conclude that the uremic state influences the integrity of intestinal barrier, but this influence could not be directly translated in an increase on the microbial translocation through the intestinal epithelium.

- 17051 | Expression of chicken ovalbumin protein in cancer cell lines of murine origin.

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The way that immune system function in cancer development has been the aim of extensive research, enabling the identification of various mechanisms by which immune cells contribute to neoplastic transformation and tumor establishment and evolution. When neoplastic cells form, they express tumor-specific antigens that the immune system can detect, recognizing them as damaged cells that need to be eliminated. Regulatory T cells (Tregs) are a subgroup of immune CD4-positive T cells with immunosuppressive functions that can be divided in two types, the ones originated in the thymus (tTregs), and the ones derived from peripheral conversion of CD4 T cells (pTregs). Tumor-infiltrating Tregs (tiTregs), are associated with tumor progression in cancer lesions, as they are responsible for the repression of anticancer immune responses. However, is still unclear how the immunosuppressive functions in tiTregs are triggered, so our study aims to understand their recruitment and activity. In order to investigate this, we started with the production of lentivirus for transduction of MC38, Panc02 and KPC cell lines to express the chicken ovalbumin (OVA) protein accompanied by the determination of the antibiotic concentration required to select the transduction cells to single out the OVA-expressing cells. Afterward a single cell sorting was made to isolate clones and in the end the detection of ovalbumin expression in the different clones was achieved by Western Blot. These cells will be inoculated into mice that only produce OVA-specific CD4+ T cells, to form subcutaneous tumors. Then, an immune response against the OVA-expressing tumor cells will be mounted after transfer of OVA-specific cytotoxic T cells. Analysis of the developed tumors and the thymuses of the mice will help in the detection of tiTregs and identify their origin, as well the mechanisms by which the tumor neoantigens are transported to the thymus for the generation of OVA-specific tumor-infiltrating tTregs.

- **17053 | Cyberstalking: what is it and how can we protect ourselves?**

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We reviewed scientific literature to understand what cyberstalking is and how can we protect ourselves from it. Cyberstalking is characterized by the persistent attempt to intrude, harass or stalk by using the Internet via computer, mobile phone or other information and communication technologies. It is a persistent, intentional and deliberate behavior of the offender and unwanted by the victim (Pereira & Matos, 2015). The behaviors of cyberstalking are many, as many as the internet and new technologies allow: they range from acts that seem harmless, such sending personal messages, to more harmful behavior like post unauthorized information on the Internet, for example post personal data or intimate images on social networks (Dreßing, Bailer, Anders, Wagner, & Gallas, 2014). Anyone could be an offender or a victim of cyberstalking. In victimology we learn that each of us is a potential victim no matter how much we protect ourselves and it's not our fault. However, this doesn't imply that some protection strategies cannot be adopted. People can adopt protective behaviour on the internet like changing passwords after a breakup or be careful with posts of private information (Association for Progressive Communications, 2011). When the cyberstalking is already occurring the most effective protective strategies to adopt are maintaining technological privacy, active technological decoupling from the perpetrator and ignore/avoid him (Tokunaga & Aune, 2017). Cyberstalking is a widespread phenomenon with serious consequences, hence the importance of this work for the clarification of the phenomenon and promotion of prevention strategies that everyone can adopt in a daily basis.

- **17054 | TNBS-induced colitis in rats: Can such an old model be refined?**

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Background: TNBS (2,4,6-trinitrobenzene sulfonic acid) is the most popular chemical inducer of inflammatory bowel disease in rats. In previous studies we found out that these animals could be categorized according to colon's macroscopic evaluation into mild, moderate or severe colitis, but TNBS induced colitis discomfort remains a challenge.

Aim: Considering the categorization of TNBS induced rats, our objective was to implement refinement measures to decrease the percentage of animals with severe colitis.

Animals and methods: Colitis was induced on day 0 (d0) in male Wistar rats, by rectal instillation of a TNBS ethanolic solution. In Refinement Protocol 2 (RP2, n=9) analgesia included tramadol (d0, 20mg/kg, SC) and paracetamol with honey administration (d0-7, 500mg/kg, PO). Metoclopramide (d1, 1mg/Kg, SC) was added to avoid intestinal stasis. In RP3 (n=13) paracetamol was also given with honey, and metoclopramide was administered on d-1, d0 and d1. In the ongoing protocol, RP4 (n=4), metoclopramide PO was administered on d-1 and then tramadol PO was added on d0. Both drugs were administered 5 times (from d0-d2). On d7 animals were sacrificed and the colon macroscopically scored (MaS) to categorize disease severity as mild (MaS=0-4), moderate (MaS=0-8) or severe (MaS=8-12).

Results: The percentage of animals with severe colitis in RP3 (7,69%) was lower than in RP2 (33,33%), while the percentage of mild and moderate animals increased (38,46% and 53,85%, respectively) when compared with RP2 (33,33% and 33,33%, respectively). Preliminary data indicates that 50% of the animals included in RP4 had severe colitis (and the others 50% moderate colitis).

Conclusions: Refining TNBS induced colitis remains a challenge, since increasing analgesia also increases the likelihood of impaired intestinal motility, despite the addition of a prokinetic agent to therapy.

Acknowledgements: Funding by UID/QUI/50006/2019 from FCT/MCTES and GEDII-Pfizer.

- 17056 | Nutritional and antioxidant properties of *Spirulina* and *Himanthalia elongata*

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The world's population is constantly increasing. It is reported that in 2050, we will face a shortage of resources to feed the entire world's population, which means it is necessary to search for alternative foods. Algae can be a good source of high-quality proteins with essential amino acids, essential fatty acids, minerals, vitamins, dietary fiber and phenolic compounds [1,2]. *Spirulina* is a filamentous blue-green microalga, well known as a good source of protein (50-70 g/100 g) [2]. It has also attracted attention by its high composition in bioactive compounds with antioxidant activity [1]. *Himanthalia elongata* has high fiber content and many studies report this brown seaweed as a good source of biological compounds, particularly polyphenols [2]. The objective of this study was to evaluate the nutritional and antioxidant properties of *Himanthalia elongata* and *Spirulina*. Nutritional composition was determined following AOAC procedures. Total phenolics content (TPC), total flavonoids content (TFC), ferric reducing antioxidant power assay (FRAP) assay and DPPH[•] scavenging activity was also performed. The nutritional results evidence that *H. elongata* has high fiber content and *Spirulina* is richer in protein. *H. elongata* has a higher TPC (25.4 mg GAE/L) than *Spirulina* (18.1 mg GAE/L). Significant differences ($p < 0.05$) were found between *Spirulina* and *H. elongata* in FRAP assay (4.3 mg FSE/g and 2.9 mg FSE/g, respectively). However, *Spirulina* extracts showed higher antioxidant activity by FRAP assay while *H. elongata* had better results for DPPH[•] scavenging activity assay. Algae antioxidant activity results, particularly for *Spirulina* extracts, are not correlated with TPC and TFC, probably due to the presence of other compounds with antioxidant activity other than those mentioned.

References:[1]-Ailton Cesar Lemes, Brazilian Archives of Biology and Technology, 2012, 55, 741-750. [2]-G. Rajauria et al. Innovative Food Science and Emerging Technologies, 2016,37, 261-268

- **17058 | Optimization of an immuno-TEM protocol for analyzing P-glycoprotein on the surface of extracellular vesicles shed by drug sensitive and multidrug resistant counterpart cells**

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Multidrug resistance (MDR), a phenomenon by which tumor cells develop cross-resistance to several drugs, is one of the main limitations of cancer treatment. Extracellular Vesicles (EVs) play a significant role in the transfer of MDR traits from donor drug-resistant tumor cells to recipient drug-sensitive (DS) counterparts. Several mediators of MDR, including the drug-efflux P-glycoprotein (P-gp), were already found in the cargo of EVs shed by drug-resistant cells. It was also described that EVs may sequester drugs in their cargo, reducing intracellular drug concentration and contributing to drug resistance. Nonetheless, this process is not fully understood. Results from other authors and our own unpublished work raised the hypothesis that P-gp may have two distinct orientations in the membrane of EVs: i) the same orientation as in the donor cells allowing drug efflux and ii) an inside-out orientation which may allow the drug influx (rather than the efflux) into EVs. However, further studies are required to confirm this. The aim of the present work is to optimize a protocol for immuno transmission electron microscopy (immuno-TEM) to confirm if P-gp is inverted (i.e. with inside-out orientation) in EVs released by MDR cells. Immuno-TEM combines the current gold standard method to characterize EVs -TEM- with the use of labelling antibodies for high-resolution localization of proteins. To accomplish this objective, we will analyse EVs shed by a DS cell line and its MDR (P-gp overexpressing) counterpart from non-small cell lung cancer. EVs will be isolated by ultracentrifugation and analysed by immuno-TEM, using an antibody which only recognizes the internal epitopes of P-gp. The effect of different fixation reagents, blocking solutions and incubating conditions with antibodies will be evaluated. This work will allow to investigate the topology of P-gp in EVs membrane, adding knowledge to the current understanding of the role of EVs in MDR. Preliminary results will be evaluated.

- **17061 | Multidisciplinary Housing Typologies: Experiences in Portugal in the 21st Century**

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The theme/object proposed for this research consists on transitions in Multidisciplinary Housing Typologies in Portugal in the 21st Century, as a reflection of a changing society.

In fact, in some Northern European countries, in recent decades, they constitute ways of living that express these new social realities, requiring new housing typologies.

There are also transformations in certain social economic groups that have led to sharing situations under one roof, more than just a family or other resident groups, absorbing diverse social groups.

In Portugal, the contemporary socioeconomic and urbanistic phenomenon (for example: gentrification, metropolization, etc.) in the biggest Portuguese cities aims to give rise to a significant transformation in the residential park.

Although Portuguese culture does not seem to be so communitarian compared to other European geographies, we perceive the explosion of experiences in typological / projectual terms. Among these, there are already some multidisciplinary housing experiences and it is pertinent to reflect on these ways of living.

The research aims to systematize a definition of housing and family appropriate to the contemporary context, a reading of the typological evolution of housing over the course of the 21st century, raise some experiences in recent history, survey urban transformation and operate a critical analysis to practical theoretical experiences based on a network of concepts form, typology, dwelling, use and flexibility and conduct a critical reflection of social structure and social participation / appropriation by the inhabitant, which is operative to multi-family housing in the coming decades.

- 17062 | Characterization of the importance of GPI anchor for the biological function of JAGGER (AGP4) and detailed subcellular characterization of JAGGER protein in *Arabidopsis thaliana*

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It has recently been shown that arabinogalactan protein 4 (AGP4), also called JAGGER, is involved in pollen tube reception, participating in the signaling pathway that leads to degeneration of the persistent synergid during the sexual reproduction process, thus playing a crucial role in the successful formation of the seed. JAGGER is therefore an essential AGP for attracting the pollen tube to the ovule, avoiding polyspermia and the polytubey phenotype characterized by multiple pollen tubes entering into the embryo sac.

Knowing that JAGGER is a GPI (Glycosylphosphatidylinositol) anchor protein, it was intended to determine whether the function of this protein is dependent on its subcellular location, determined exactly by this GPI anchor. For this, it was initially sought to confirm results obtained in previous studies characterizing in detail the location of the JAGGER protein. From lines previously fused with JAGGER and YFP (Yellow Fluorescent Protein) reporter protein, by confocal microscopy, it was concluded that JAGGER expression occurs essentially at the level of stigma, transmission tissue, embryo sac, and integuments near the ovule micropile at an early stage of flower development (1 to 2 weeks after flowering), and at the transmission tissue, embryo sac, and integuments near the ovule chalaza at a later stage of development (3 to 4 weeks after flowering). Therefore, JAGGER protein appears to have a certain differential expression depending on the phase of plant development. Since not only the promoter but also the full coding region of JAGGER was used, it was also found that JAGGER was being expressed at the cell wall level.

To study the involvement of GPI anchor in protein function, a construct was used where the GAS region corresponding to the hydrophobic domain of GPI anchor was removed. However, none of the seeds previously obtained germinated.

- 17063 | Iodine supplementation and knowledge: comparison between physicians and pregnant women of the IoMum cohort.

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Introduction: In 2013, the Portuguese Directorate-General of Health (DGH) issued a guideline recommending iodine supplementation for pregnant women. Nevertheless, no study has been performed to assess compliance to this guideline. In fact, a degree of insecurity regarding this issue is generally perceived among physicians, given their uncertainty about the potential health hazards associated with iodine excess.

Aim: To assess the compliance of health professionals to the DGH guideline and their knowledge regarding the importance of iodine and iodine nutrition during pregnancy.

Methodology: Obstetricians and general practitioners were invited to answer a questionnaire via their professional associations or during medical conferences. The questionnaire included 22 questions, mainly multiple choice, on demographic data, clinical practice regarding iodine supplementation and knowledge on dietary sources of iodine.

Results: The questionnaire was completed by a total of 408 physicians (64.7% obstetricians and 35.3% general practitioners). Preliminary data showed a high compliance of physicians to the DGH guideline for iodine supplementation (n=349, 85.5%). In addition 99.3% (n=403) of physicians reported having heard about iodized salt and 49.9% (n=203) indicated recommending the use of iodized salt to pregnant women. Furthermore, a great majority of physicians (n=364, 90.3%) correctly identified fish as one of the richest iodine food sources, whereas only 10.9% (n=44) knew that milk is the food that contributes the most to iodine intake. Soon, further data, namely the detailed iodine knowledge scores of physicians, and their association with specific demographic characteristics as well as the differences in between specialties and the comparison to pregnant women iodine supplementation practice and iodine knowledge will be communicated.

Trial registration number: NCT04010708.

- 17064 | Nocturnal Porto: relationship between an urban phenomenon and a specific condition

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This research aims to investigate the urban life in the city of Porto at night.

In the last decades the city of Porto has been the target of the tourist phenomenon and the gnetrification that radically transformed life in the city. It is interesting to analyze / proceed the survey and analysis of critical ambit of new and different realities present in the city space and consequent social transformations entailed.

It will be argued that nocturnal Porto constitutes a city unknown to certain parts of the population itself residing in different specific areas.

It is intended to identify in these zones, the type of use / space and thus associate the different daily experiences / time zones, which affect the space of the night city seasonally and daily.

The city is a network of distant places.

As an objective of my research, it is up to me to understand the recent transformations in the city of Porto, to carry out the statistical, cartographic and imagnetic survey, as well as to understand the daily transformations that occur in the city and in its different sectors, accordingly to the schedule and time.

The city of Porto does not change throughout the day and night cycle, but highlights different zones and areas, thus reflecting a wide variety of lifestyles that take place by different social groups in the same space.

- **17065 | Diabetic dysmotility - in vivo evidences in a STZ induced T1D rat model**

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Introduction: Enteric dysmotility is a long-term complication of diabetes mellitus (DM) that causes significant discomfort in 76% of diabetic outpatients. In order to study this disorder researchers usually use streptozotocin (STZ) induced type one (T1D) diabetes model in rodents.

Aim: Since there are no in vivo evidences for motility changes in STZ induced T1D rats, we decided to evaluate those signs in animals that were assigned to another experimental protocol.

Methods: T1D was induced in adult male Wistar rats by a single intraperitoneal injection of streptozotocin (STZ, 55 mg/kg). Rats that had an initial glycemia of $103,10 \pm 18,40$ mg/dL ($n=12$) became hyperglycemic ($385,5 \pm 47,04$ mg/dL, $n=12$) within 48 hours and exhibit typical T1D signs, like polydipsia and polyuria. For 14 days animals' body weight, food and water intake and fecal pellets production were daily weighted. Then STZ rats were sacrificed and intestines (ileum, cecum and colon) were cleaned of their content and weighed.

Results: Diabetic animals lost $- 8,43 \pm 3,63$ % ($n=10$) of their body weight in 14 days, while their littermates got heavier $+ 7,85 \pm 1,74$ % ($n=8$). As expected, STZ induced animals also ate more ($36,74 \pm 2,88$ g/day, $n=6$ vs. $22,98 \pm 0,85$ g/day, $n=8$), drank more water ($191,04 \pm 5,71$ g/day, $n=6$ vs. $37,49 \pm 1,80$ g/day, $n=6$) and produced more fecal pellets ($18,59 \pm 0,98$ g/day, $n=6$ vs. $7,75 \pm 0,30$ g/day, $n=8$) than controls. Regarding the intestines of T1D animals, it was obvious that the cecum was more dilated and that the cecum plus ileum and colon were heavier ($2,53 \pm 0,33$ % of body weight, $n=10$) than the same intestinal parts of control animals ($1,76 \pm 0,11$ % of body weight, $n=5$).

Conclusions: Taken together these data indicate that STZ induced T1D rats lose body weight but eat, drink and eliminate more feces than controls, displaying structural intestinal differences that should be taken into consideration in future studies.

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- 17077 | ECG Compression and QRS Detection: an IoT Approach

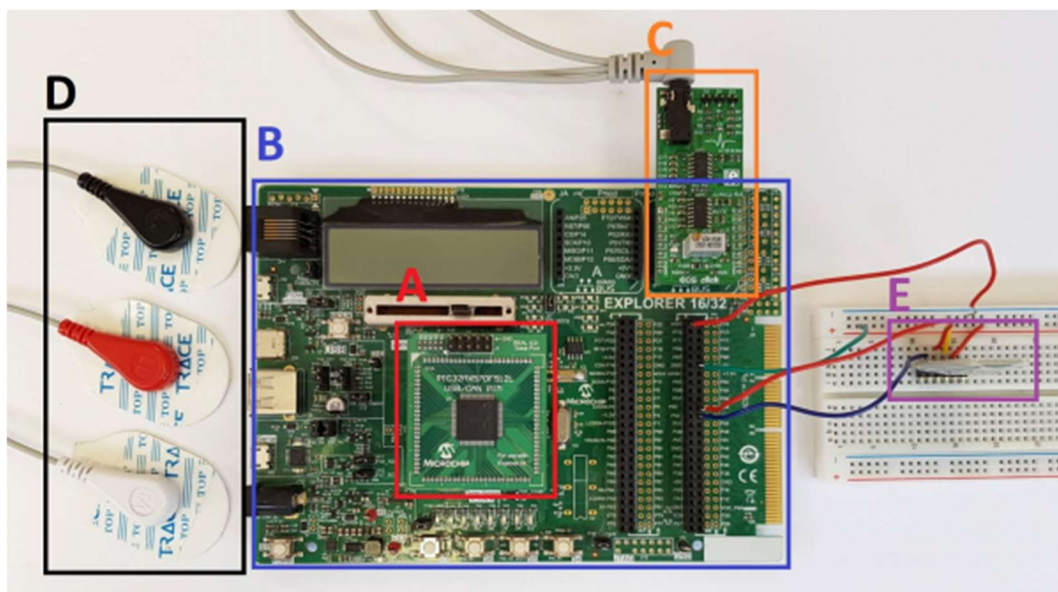
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An electrocardiogram (ECG) is a clinical tool used to monitor the electrical activity of the heart. The electrical potentials generated by the heart are measured through electrodes placed on the surface of the skin. The ECG is the graph of voltage versus time resulting from those measurements. Due to its non-invasive nature, immediate availability and high versatility, the ECG is one of the most common medical studies in the assessment of cardiovascular disease.

The Holter monitor is a portable device that measures and records ECG continuously for a period of 24 hours or longer. Usually, 10 electrodes are placed at certain locations on the chest, arms, and legs. From the 10 electrodes we get a total of 12 ECG curves that look at the electrical activity of the heart from different angles.

In the era of the Internet of Things (IoT) it is natural that entrepreneurs and companies see an opportunity in updating devices like the Holter. On this project we developed a prototype device for a wireless ECG recorder that would connect to a smartphone. In order to reduce the required space on the device we developed and implemented a compression algorithm on the device. Besides that, we also studied the possibilities of implementing a real time QRS complex detector. Such a detector would allow to diagnose arrhythmias and other heart problems as they happen. When tested in the MIT-BIH Arrhythmia Database the compression algorithm obtained a compression ratio of 5.61:1, which means that the file with all the database compressed only occupied around 18 percent of the original size. The QRS detection algorithm was also tested in the same database. In a total of 109966 QRS complexes that are present in the database, the algorithm correctly identified 98.83 percent of the complexes.



Device prototype

- 17079 | Vertical subsurface flow constructed wetland for the treatment of olive oil wastewater toxicity

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Constructed wetlands (CW) have been proposed for a more sustainable treatment of a variety of wastewaters while also being economic and easy to maintain. The treatment of olive oil mill wastewater (OOMW) with the use of a CW would be a green step in the production of olive oil. This work aimed to assess the effectiveness of a pilot CW to improve the quality of OOMW in terms of its toxicity. Furthermore, and considering the seasonality of this activity, the valorization of the CW substrate at the end of the season, as a soil fertilizer, was also assessed.

Nine vertical sub-surface flow CWs (VSSCW) units were prepared with gravel, light expanded clay aggregates and artificial soil. *Thypha* sp. plants were planted and three treatments with three replicates each were tested: the control (E CTL), and OOMW effluent non-diluted (E 100%) and 50% diluted (E 50%). The effluent was recirculated and outflow samples were collected on three different experiments with different retention times. After three effluent load experiments the substrate was removed, grinded and stored for ecotoxicological tests with plants and soil invertebrates.

The pH of the effluent changed from 4.70 (± 0.01) to 7.02 (± 0.12) after CW treatment. *Allivibrio fischeri* bioluminescence inhibition test (MicrotoxTM), *Raphidocelis subcapitata* growth inhibition test and *Daphnia magna* immobilization test showed a reduction of the toxicity of OOMW, after CW treatment. Avoidance tests with the oligochaete *Eisenia fetida* showed no avoidance of soils fertilized with CW substrate. A significant preference for the soils treated with substrate of the non-diluted OOMW CW replicates was recorded ($P=0.0124$). The substrate of the CW units was not phytotoxic to plants however they did not improve soil fertility.

- **17084 | Leader Development: evaluating a leader development program**

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Leader development is a recent area of research, stemming from organizational practices that focus on leader development programs to gain competitive advantage. Therefore, program evaluation gains importance, as it allows determining the value and efficiency of a program. The overall objective of this research is to evaluate the leader development program implemented by an engineering non-profit organization. To this end, a qualitative and evaluative approach was adopted through a case study methodology. Data were gathered from program stakeholders through interviews and written documents. The results show that the program has underlying functionalist and interpretive discourse principles, focusing on the results of the organization and on people's well-being. The leadership approach combines principles of TABEIS and Transformational Leadership theory, aiming a leader who is authentic, caregiver, constructor, contaminator, entrepreneur, ground breaker and meaning designer. The leader's development was essentially based on a self-reflective process, using the method of critical incidents, projective techniques and role-playing games. Regarding the development process, two stages focusing intrapersonal and interpersonal development were identified: (i) ExtraMind activity and (ii) a Retreat of leaders. Throughout this activities, two layers of leader development were aimed: identity and self-regulation development and adult development. The major contribution of the study was the evaluation of an executed leader development program, which allowed us to do some recommendations to the organization concerning its improvement. In addition, it contributes to leader development program's evaluation. By presenting a more complete analysis system it allows a deeper and more exhaustive analysis of a program.

Keywords: Leadership, Leadership development, Program evaluation

- **17088 | Floating Islands Didactic Method in School Context**

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Floating Wetland Islands (FWI) are floating platforms with vegetation whose operation is inspired by physicochemical and biological processes that occur in natural wetlands. It is based on the interaction between plants, microorganisms and surface water. These systems can be applied to various water bodies such as lakes, rivers and marinas. This technology can be applied for the purpose of improving the water quality in question, through phytoremediation processes, or as a promoter of biodiversity and ecosystem rehabilitation.

This paper aims to use the floating island didactic model as a facilitator of teaching-learning in water purification processes and ecosystem services for primary school students and is also aligned with the Sustainable Development Goals 6 and 14 of the Agenda 2030. To this end, a didactic model based on scientific knowledge and knowledge of already implemented floating islands is being developed, which will be transposed into a protocol to be used in the school context.

We opted for the participatory methodology in order to integrate students to the pedagogical content and thus make them meaningful. The floating island model was conceived with low cost materials, in order to make it inclusive in the most diverse school contexts.

With the construction and implementation of the didactic model that involves a complex content, it is expected that the student will eventually be able to relate the socio-environmental context in their surroundings with scientific knowledge.

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- 17089 | A molecular cell-based sensor for PPARs ligands: drug discovery in cyanobacteria

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Peroxisome Proliferator-Activated Receptors (PPARs) are ligand-activated nuclear receptors involved in several metabolic and cellular processes, such as fatty acids oxidation, inflammation and lipids storage. Three PPAR isoforms have been identified, whose natural ligands are polyunsaturated fatty acids (PUFA) and their oxidized derivatives-oxylipins. Cyanobacteria are photosynthetic prokaryotes that produce a vast array of secondary metabolites to guarantee their survival even under extreme conditions. Its production is induced by biotic and abiotic stress factors, through different pathways. The biotechnological potential of these compounds is increasing in pharmaceutical, cosmeceutical and agricultural industries. The main goal of this work is to optimize a cell-based luminescent sensor to high throughput screen (HTS) of cyanobacteria of the Blue Biotechnology and Ecotoxicology Culture Collection (LEGE-CC) for PPAR ligands. Marine strains were chosen due to their greater content in PUFA, as compared to freshwater ones. The sensor is based on a transactivation assay, here optimized for HTS. It was possible to "scale-down" the assay from 24- to 96-well plates, allowing the reduction of reagents' volume and the analysis a higher number of samples at once, in a homogeneous assay. Moreover, it was possible to stabilize the assay luminescent signal, being now long lasting. Also, the screening of three PPARs simultaneously allowed to increase the information obtained from each well, and further reduce time and costs. Eight methanolic fractions of two cyanobacteria strains were analysed under the current assay's optimization status, having been detected three positive fractions of one strain. Those were then tested for each PPAR separately for confirmation and clarification. Results indicate that this approach is a fast and easy tool, that can be used for bioprospection of large cyanobacteria extract libraries for PPAR ligands, with a focus on drug discovery.

- **17090 | 3D PRINTED FOOD: AN ANTERTNATIVE TO CONVENTIONAL COOKING TECHNOLOGY**

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Food is a need but also something we enjoy and try to improve in easiness, flavor and nutritional value. With the appearance of 3D printing and its many applications, food is a different one where 3D printing can be used and this could be a very advantageous combination of fields, allowing for the improvement of the customization industry, and to control the nutritional value, as well as facilitate the use of some unconventional ingredients.

The aim of the work is to compare cookies made in the traditional way with 3D printed cookies, in terms of nutritional value, appearance and taste.

A conventional 3D printer was adapted to use a syringe-like head, which could be filled with dough and deposited it in the wanted shape. For the first tests and optimization of printing parameters, a mixture of flour and water was used, with the optimal ratio assessed. Optimal printing parameters were determined for the used dough. A process to bake the cookies while printing using a stream of hot air is being assessed. The comparison will be performed using different techniques for the nutritional value and by the creation of a simple scale to evaluate appearance and flavor.

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- 17092 | Evaluation of the impact of the hyperlipid diet on NonAlcoholic Fatty Liver Disease in obese patients

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Patients who undergo bariatric surgery usually have hypertrophic liver due to a non-alcoholic fatty liver disease. Reducing the liver size will facilitate surgery by reducing possible complications, benefiting both the surgeon and the patient. The present study aimed to evaluate the effect of a hyperlipid diet with carbohydrates restriction in hepatic steatosis instituted for 3 weeks in the preoperative period. This study evaluated 8 preoperative obese women who underwent a hypoenergetic and hyperlipidic diet for 3 consecutive weeks. The total energy value was calculated based on the desired weight and the dietary plan had the following distribution of macronutrients: 60% fat, 30% protein and 10% carbohydrates. Its anthropometric parameters and ketonemia were evaluated before the beginning of the diet, in the second week of the study and at the end of the diet. Before and at the end of the nutritional intervention, some analytical parameters were collected and the patients underwent, to assess the liver fat content, a transient hepatic elastography to obtain the controlled attenuation parameter (CAP) value and an ultrasound. When comparing the values obtained at the beginning and the end of the study, a significant average decrease in weight ($p=0,012$), body mass index ($p=0,011$), waist circumference ($p=0,032$), AST ($p=0,027$) and alkaline phosphatase ($p=0,004$) serum levels were observed. Of the five patients with valid controlled attenuation at baseline and at the end of the intervention, there was a reduction of the CAP in three patients. Regarding the US-FLI score, it was decreased in two patients, and in the remaining patients there were no changes. The established diet led to improvements in some of the anthropometric parameters and to the decrease in some of the serum levels of the clinical parameters. It also decreases the value of the CAP and in US-FLI score in some patients. Key words: Hepatic steatosis, Hyperlipidic diet, Fibroscan, ultrasound

- **17099 | INFLUENCE OF AGE ON MOVEMENT REACTION TIME AND FOOT DEXTERITY IN FOOTBALL ATHLETES**

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Football, as a sport, has a variety of components that are in constant interaction where physical skills are an aspect that directly influences the performance of athletes. Hence, our goal was to evaluate the influence of age in foot dexterity (FD) and movement reaction time (MRT) in soccer athletes, since, several authors indicated these abilities is extremely important for the practice of this modality. Our sample consisted of 40 male football players (20 adolescents and 20 adults), aged between 12 and 36 years and with years of experience between 4 and 27 years. Tapping pedal test were used to study FD. Regarding the MRT, we used the Nelson Movement Respond Choice test. Statistical procedures involved descriptive statistics and non-parametric tests (Mann-Whitney) to compare age groups and Wilcoxon to compare side of movement in the MRT. Results: in both tests the adults were significantly better than the adolescents. In FD for the preferred foot (PF) adults obtained an average result of 26.65 ± 2.52 vs 19.95 ± 1.93 from the adolescents. For the non-preferred foot (NPF) adults obtained an average result of 23.90 ± 2.32 vs 18.25 ± 2.31 from the adolescents. In RTM for the right-side adults obtained an average result of 18.25 ± 2.31 vs 1.82 ± 0.15 from the adolescents. For the left side adults obtained an average result of 1.60 ± 0.14 vs 1.82 ± 0.13 from the adolescents. Conclusion: According to the obtained results, we can conclude that the age influences the foot dexterity and the movement reaction time in football athletes.

Keywords: Foot dexterity; Movement Reaction Time; Football; Age

- 17100 | Reaction Speed and foot dexterity between distance runners and sprinters

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In athletes, reaction time is of great importance. A fair reaction time negatively affects athletes to obtain good performances. Speed of reaction is a key factor in athletes performance as it is a major contributor to the end result. Together, speed and movement accuracy (dexterity) contribute positively to a good performance, because it shows the coordination of athletes, a key element in many sports, and athletics is no exception. Thus, this study aimed to compare the speed of reaction and foot dexterity in distance runners and sprinters, to verify the differences and how this may condition/advantage both disciplines. The sample involved 20 athletes of both sexes, between 18 and 25 years old (20.20 ± 2.35), with 5.60 ± 3.12 years of practice. For reaction speed and bilateral assessment of foot dexterity, we used the Nelson foot reaction rate test (1965) and the bilateral foot dexterity test (coordination ladder), respectively. The statistics used were descriptive and not parametric (Mann-Whitney correlations). Results: Comparing groups, there are significant differences between the reaction rate of the non-preferred foot and the preferred foot in sprinters ($r = 0.782$, $p = .008$) and in long distances runners, this difference is also verified ($r = 0.648$, $p = .043$), but it isn't as significant as in sprinters. In the speed discipline, differences were also observed between the reaction speed of the preferred foot and the foot dexterity ($r = 0.622$, $p = .055$), being close to the significance level. Conclusion: It was possible to verify that it was in the speed discipline that occurred the greatest discrepancy between results, which occurred in the reaction speed. It is also in the sprinters that the greatest correlation was found, between reaction speed and bilateral foot dexterity.

- 17103 | Influence of CrossFit training on Static Balance and Dynamic Balance

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The main goal was to analyze the influence of CrossFit training on static and dynamic balance between men and women, in the total sample and according to the group and age group. **The sample consisted in** 42 individuals (27 males and 15 females), aged between 20 and 47 (34.88 ± 6.39). **The instruments used were the** Eurofit Flamingo Test (1983) (Static Balance Test), Star Excursion Balance Test (SEBT, Dynamic Balance Test) (Kinzey & Armstrong, 1998) and Foot Preference Questionnaire (Coren, S. 1993). The Mann-Whitney test was used to compare sex and the Wilcoxon test to compare before and after training. **The results** revealed no significant differences between males and females in any of the tests performed. Regarding before and after training, it was found that only in the dynamic balance test significant differences were found.

Conclusion: Before and after training had a significant effect only on dynamic balance.

Keyword: static balance, dynamic balance, training.

- **17108 | Patient centric design of a topical vehicle for corticosteroids: a strategy to improve adherence to dermatological treatments**

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Topical corticosteroids are a mainstay for the treatment of several skin diseases. Adherence to topical treatments is known to be influenced by the vehicle properties. Several studies emphasized as positive attributes of topical vehicles: low residue, minimum clothes' staining and low stickiness. Marketed medicines containing betamethasone dipropionate currently available include ointment, cream and solution. The aim of this work was to develop a new vehicle (emulgel) for corticosteroids, focusing on patient preferences, as a strategy to improve medication adherence.

An emulgel obtained from a polyacrylic acid polymer hydrogel was prepared using a non-irritating surfactant, with a cold emulsification process. Betamethasone dipropionate (0.64 mg/g) was incorporated into the oily phase. The textural analysis was performed in the compression mode in a texturometer by carrying out a spreadability test. Measurements were performed in triplicate at 20°C. The parameter negative area (correlated with stickiness) was calculated from the texturogram. Evaporation rate and residue were evaluated after application on polymethyl methacrylate plates (1.5 mg/cm²). Clothes' staining was assessed by covering the plates with polyester fabric and obtain photographic records. Petrolatum (which is the main component of ointments) was similarly evaluated for comparison purposes. Physical stability was evaluated by centrifugation.

The emulgel presented a white, shiny appearance and good spreading properties. No phase separation was observed after centrifugation. Lower residue, lower stickiness and less ability to stain polyester fabric, in comparison with petrolatum, were observed

Following these results, satisfaction with treatment is expected to be higher for the emulgel than for ointments, which can have a positive effect on medication adherence. The impact of this new vehicle on adherence to topical treatments should be further confirmed in real clinical settings.

- 17113 | Potential of lost fishing gear for adsorption of Polycyclic Aromatic Hydrocarbons (PAHs)

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Abandoned, lost or otherwise discarded fishing gears pose a serious threat to the marine environment. Fishing gears are normally made of plastic assemblies, and as such those nets have the potential to adsorb organic pollutants such as Polycyclic Aromatic Hydrocarbons (PAHs).

To evaluate this potential, two hotspots (one in Matosinhos and another in Esposende) in the NW Portuguese coast, where lost fishing gears can be found, were studied in terms of PAHs concentrations. Therefore, water and sediment samples were collected at the two locations, at different time of the year. Filtration of water samples and extraction of PAHs in sediment samples by ultrasound techniques, followed by gas chromatography mass spectrometry, was achieved for the quantification of 10 priority PAHs: Naphthalene, Acenaphthylene, Acenaphthene, Fluorene, Phenanthrene, Anthracene, Fluoranthene, Pyrene, Benz(a)anthracene and Chrysene. PAHs concentrations were low, being in general below detection limits or below quantification limits. Accordingly, the surveyed areas were classified as weakly polluted by these organics.

In the next step, quantification of PAHs adsorbed on those gears and several laboratory and in situ studies will be carried out to evaluate gears potential for adsorption of PAHs.

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- 17118 | Study of the structure cost of the Extractive Industry in Portugal - Optimization of two dry-mixed mortar Plants

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To analyze an optimization process within the cost structure of two twin dry-mixed mortar plants is the principal goal of the present poster.

The final product, dry-mixed mortar, a uniform granular powder mixture, is composed of pretreated aggregate, quantitative cementing material and the trace amounts of high-tech additives, with automatic measurement according to the formula and homogeneously mixed (Yang and Chen 2012).

Limestone aggregate (size 25-50 mm), the primary raw material supplied by two different quarries, is crushed, grinded, sieved and stored on both plants in 5 particle size classes.

The crushing process uses a Vertical Shaft Impactors (VSI), a rock-on-rock autogenous crushing impactor (Sandgren, Berglind, and Modigh 2010).

Final aggregate products output (0.0-4.0 mm) should meet the following requirements: moisture content ($< 0.5\%$) and mud content ($< 1.0\%$).

To identify major cost-performance indicators (KPI) throughout the process and improvements proposal on the operator's dry-mixer mortar plants are the intended core results.

An Ishikawa Diagram can be used to pinpoint the critical factors that lead to cost optimization in this case-study aggregate production.

- 17120 | Investigating the effect of combined treatment of Triple Negative Breast Cancer and Non-Small Cell Lung Cancer Cell Lines with Vinorelbine and Pirfenidone: a drug repurposing study

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It was recently shown that pirfenidone (PF) - an FDA approved drug for the treatment of idiopathic pulmonary fibrosis - has an antitumor effect in different cancers, affecting progression, metastization and signaling pathways. Additionally, the combination of PF with anti-cancer drugs enhances their effect, suggesting that this could be a promising therapeutic approach for cancer treatment. Drug repurposing presents economic advantages and allows new treatment possibilities, specially for cancers with limited therapeutic alternatives [as triple negative breast cancer (TNBC) and non-small cell lung cancer (NSCLC)]. Thus, it is important to confirm whether PF has antitumor activity in various experimental cancer models and to understand if it has the potential to increase the sensitivity of tumor cells to other drugs. Lately, Vinorelbine (VR) - an anti-mitotic chemotherapeutic drug - has been used in the clinic as a treatment option for breast and lung cancer.

Therefore, our aim is to assess the potential of the combination of PF and VR treatment, as a new therapeutic strategy for the treatment of TNBC and NSCLC. With that purpose, the specific objectives of this work are to evaluate the effect of the drug combination on: (i) the cell growth of the tumor cell lines MDA-MB-231 (TNBC) and NCI-H460 (NSCLC); (ii) the expression levels of proteins associated with cancer signalling pathways and apoptosis; (iii) a putative population of cancer stem cells (CSCs).

Our preliminary data showed that the individual drugs reduced the growth of both tumour cell lines, as indicated by the sulforhodamine B assay. In addition, we observed that PF increases the sensitivity of both cancer cell lines to the effect of VR. This combination is currently being tested on a non-tumorigenic breast cell line, MCF12A, and on a multidrug resistant NSCLC tumour cell line, RH460. Future work will try to elucidate mechanisms of action of PF and of this drug combination.

- **17307 | Graphene-based materials for drug delivery and photothermal cancer therapy**

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Cancer affects worldwide population lacking a global effective treatment. Photothermal therapy (PTT) can be an effective non-invasive strategy. Near-infrared (NIR) light can induce hyperthermia (39-47°C), inducing tumor cell apoptosis. Graphene-based materials (GBM) can absorb radiation and possess large surface area, holding potential for drug release hyperthermia-triggered effects. GBM and GBM loaded with 5-fluorouracil (5-FU), an anti-cancer drug, are herein proposed as platforms for cancer PTT. Nano-sized graphene oxide (GOn) was produced through the modified Hummer's method followed by ultrasonication and further thermally reduced and functionalized with poly(ethylene) glycol (PEG) to obtain stable aqueous dispersions (rGOn-PEG). GBM (0.25mg/mL) were mixed with 5-FU (concentration range: 0.25-5mg/mL). GBM aqueous dispersions were irradiated with a LED source of 812.8 ± 29.9 nm (150 mW cm⁻²). The effect of GBM and NIR irradiation was evaluated by resazurin assay using a human skin carcinoma cell line (A431 cells). GOn was obtained with mean lateral dimensions of 248 nm, as determined by TEM. GOn thermal reduction was confirmed by a redshift in the absorbance peak. 5-FU was successfully loaded by simple molecular physisorption on both GBM. Under NIR irradiation, rGOn-PEG temperature reached 47°C after 30 min, which is within temperature ranges of hyperthermia. rGOn-PEG combined with NIR reduced A431 cells viability. This study opens new avenues for the development of GBM-based platforms for drug delivery and cancer PTT.

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