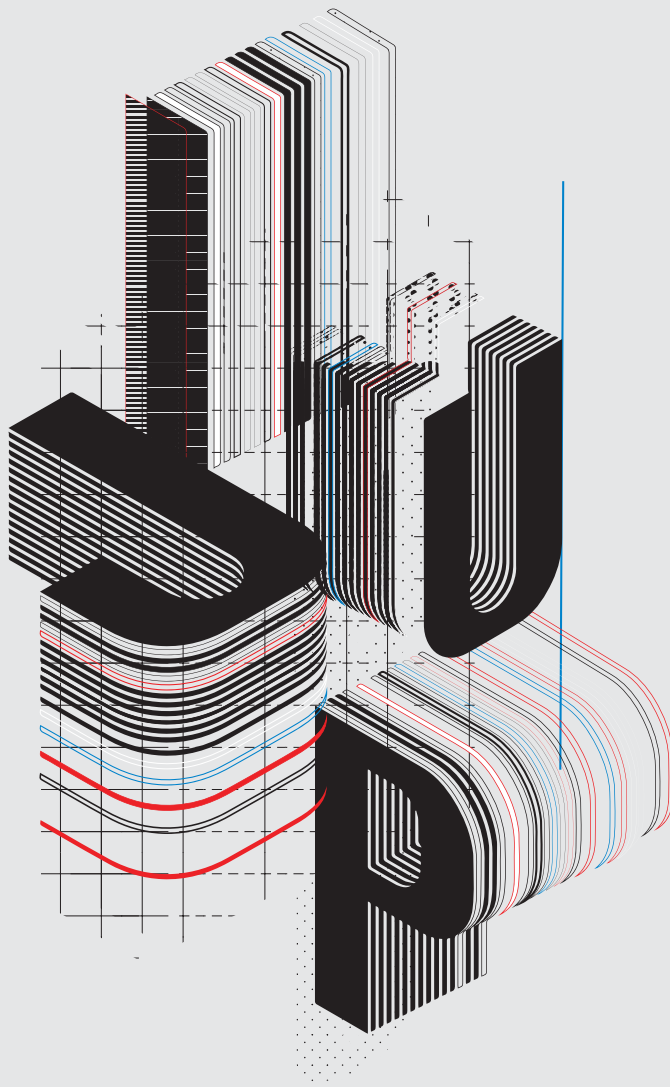


BOOK OF ABSTRACTS

U.PORTO

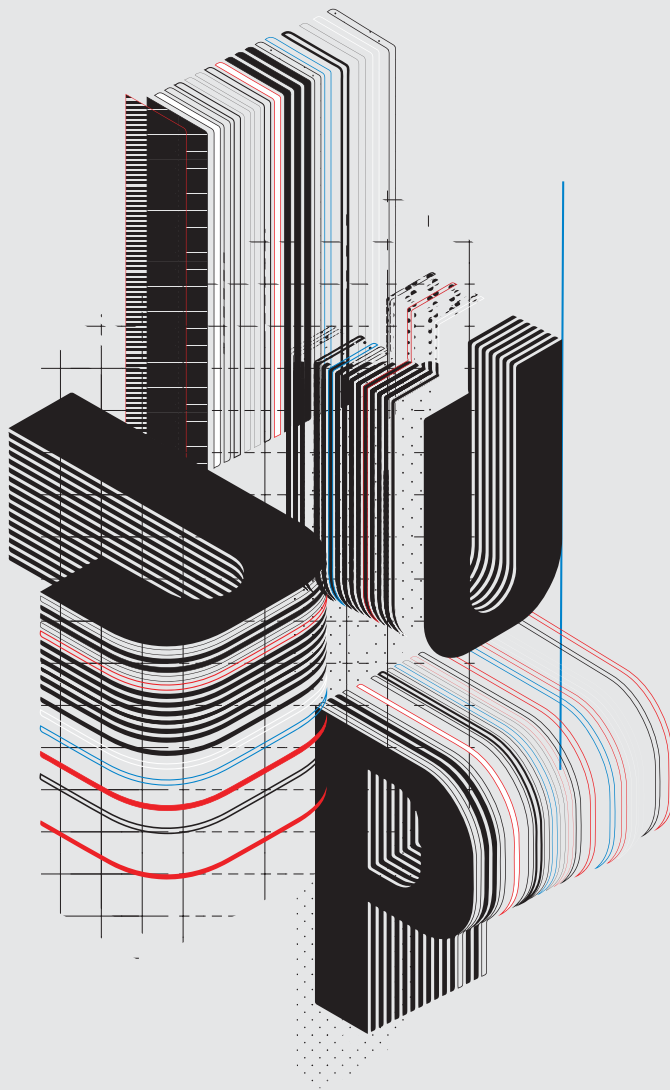
12TH MEETING
OF YOUNG RESEARCHERS
OF **UNIVERSITY OF PORTO**



ENCONTRO DE
INVESTIGAÇÃO
JOVEM DA
UNIVERSIDADE
DO PORTO

REITORIA DA U.PORTO
12.^a EDIÇÃO

13-14-15
FEV 2019



U.PORTO

CREDITS

Livro de Resumos do 12.º Encontro de Jovens Investigadores da U.PORTO

Universidade do Porto

Vice-reitor para a Investigação, inovação e internacionalização
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ISBN

978-989-746-203-0

Design

Gabinete de Comunicação e Imagem da U.Porto

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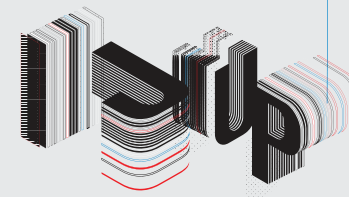
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PROGRAM

12.^a EDIÇÃO



	WEDNESDAY, 13 th	THURSDAY, 14 th	FRIDAY, 15 th
08H00 › 08H30			
08H30 › 09H00	REGISTRATION	REGISTRATION	REGISTRATION
09H00 › 10H30	PARALLEL ORAL SESSIONS I A1 – Sport Sciences I A2 – Architecture I A3 – Health Sciences I A4 – Chemistry I	PARALLEL ORAL SESSIONS V A1 – Biological Sciences I A2 – Engineering I A3 – Health Sciences V A4 – Environment I	PARALLEL ORAL SESSIONS IX A1 – Biological Sciences III A2 – Arts A3 – Agro Food I A4 – Economics and Management I
10H30 › 11H30	Opening POSTER VIEWING & Coffee Break	POSTER VIEWING & Coffee Break	POSTER VIEWING & Coffee Break
11H30 › 13H00	PARALLEL ORAL SESSIONS II A1 – Sport Sciences II A2 – Architecture II A3 – Health Sciences II A4 – Chemistry II	PARALLEL ORAL SESSIONS VI A1 – Biological Sciences II A2 – Engineering II A3 – Health Sciences VI A4 – Environment II	PARALLEL ORAL SESSIONS X A1 – Biological Sciences IV A2 – Engineering III A3 – Agro Food II A4 – Economics and Management II
13H00 › 14H30	Lunch Break	Lunch Break	Lunch Break
14H30 › 16H00	PARALLEL ORAL SESSIONS III A1 – Maths A2 – Language Sciences I A3 – Health Sciences III A4 – Psychology I	PARALLEL ORAL SESSIONS VII A1 – Chemistry III A2 – History & Cultural Studies A3 – Health Sciences VII A4 – Law	PARALLEL ORAL SESSIONS XI A1 – Sport Sciences III A2 – Engineering IV A3 – Health Sciences IX A4 – Psychology & Sciences of Education
16H00 › 17H00	POSTER VIEWING & Coffee Break	POSTER VIEWING & Coffee Break	
17H00 › 18H30	PARALLEL ORAL SESSIONS IV A1 – Physics & Astronomy A2 – Language Sciences II A3 – Health Sciences IV A4 – Psychology II	PARALLEL ORAL SESSIONS VIII A1 – Chemistry IV A2 – Literary & Cultural Studies A3 – Health Sciences VIII A4 – Criminology	

FOREWORD

A U.Porto quer ser cada vez mais uma instituição vocacionada para a investigação científica, o que implica um reforço da produção interna de conhecimento e uma maior ligação entre o ensino/formação e as atividades de investigação, inovação e desenvolvimento tecnológico. Daqui resulta uma influência transversal da investigação científica nas diferentes valências da vida académica, dentro de uma lógica de ecossistema em que cada unidade, grupo ou indivíduo contribui à sua medida para a produção de conhecimento.

Neste pressuposto, o IJUP assume uma especial importância enquanto iniciativa de promoção e valorização da investigação jovem realizada na nossa Universidade. Ao incentivar a produção de conhecimento pelos estudantes, o IJUP contribui para o aprofundamento da cultura científica na U.Porto, e promove a investigação no seio da comunidade académica.

Acresce que, para a cabal formação de um estudante do ensino superior, é fundamental orientar a nossa comunidade estudantil para a procura e construção do conhecimento, mais do que para a aquisição passiva dos fundamentos teóricos e conceptuais das diferentes áreas de estudo. Devemos, portanto, desenvolver o pensamento crítico e científico, preparando os estudantes para enfrentarem um mercado de trabalho cada vez mais ajustado à economia do conhecimento.

É, pois, com entusiasmo que a nova Equipa Reitoral da U.Porto organiza o 12.º IJUP, consciente que está dos méritos que a iniciativa encerra. Méritos, esses, que decorrem da possibilidade que é dada aos estudantes de apresentarem os seus projetos de investigação, com tudo o que isso representa enquanto experiência de comunicação em público, de debate científico inter pares, de partilha de conhecimento, de aprofundamento epistemológico e de desenvolvimento intelectual.

Dito isto, resta-me agradecer a todas as pessoas envolvidas na organização do IJUP'19, desde os técnicos liderados pelo Vice-Reitor Pedro Rodrigues aos docentes do comité científico responsável pela análise dos projetos. Uma palavra de reconhecimento também para o Santander Universidades, que uma vez mais apoia esta iniciativa.

Deixo propositadamente para o fim a saudação aos estudantes autores dos projetos do IJUP'19, a quem desejo as maiores felicidades académicas e sucessos científicos.

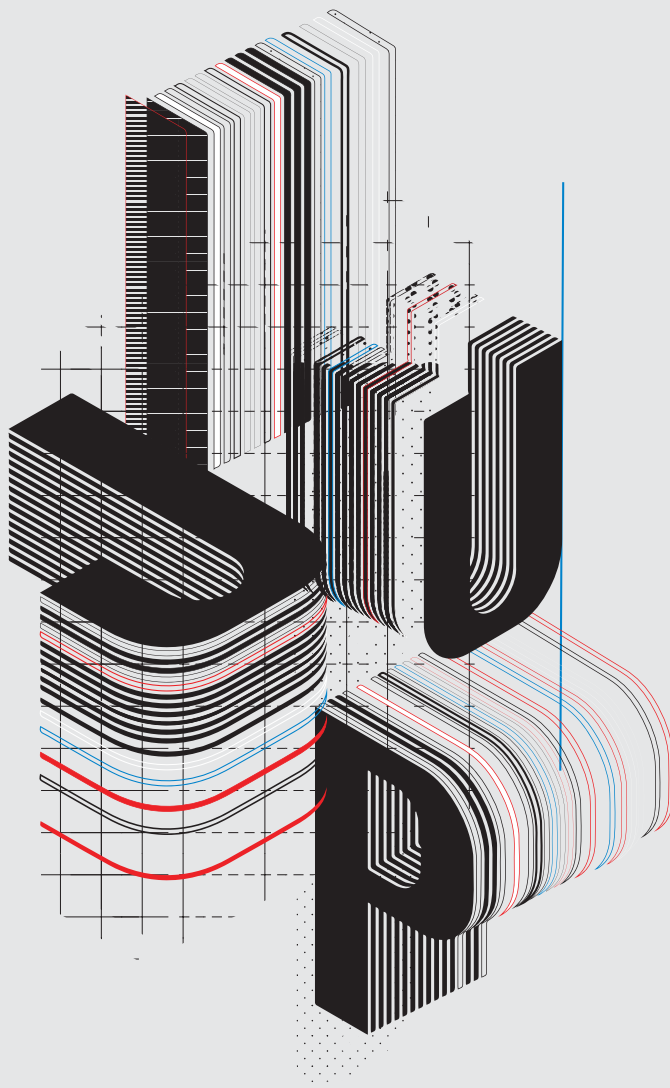
António de Sousa Pereira

Reitor da Universidade do Porto

ORAL SESSIONS

12.^a EDIÇÃO

U.PORTO



- **14965 | Development of a visual method for hydrogen peroxide determination**

Rafael C. Castro, LAQV, Portugal

David S. M. Ribeiro, LAQV, Portugal

José X. Soares, LAQV, Portugal

João L. M. Santos, LAQV, Portugal

Hydrogen peroxide is an oxidant frequently used in many applications, namely for contact lens disinfection. Nevertheless, H₂O₂ can be harmful to the ocular epithelium and cornea. Therefore, it's very important to monitor its concentration to certificate the safety utilization of these solutions [1].

In this work, two different photoluminescent nanoparticles were used for the determination of H₂O₂ in real samples. This dual emission nanosystem involved the combination of a carbon dot (CD), that does not react with H₂O₂ and was therefore used as internal reference, and a CdTe QDs stabilized with 3-mercaptopropionic acid (MPA), used as analyte dependent fluorophore. Different sizes of MPA CdTe QDs were explored in order to optimize the method under study.

Two distinct nanosystems were exploited to implement a ratiometric assay for the determination of H₂O₂. In addition, by studying the probes through their fluorescence intensity variation, an image processing-based method was simultaneously explored for the determination of H₂O₂. An RGB-type probe based on color modulation of the nanosystem was studied. The visual processing-based method has the advantage of not requiring special equipment providing a quick procedure suitable for a semi-quantitative detection of H₂O₂ [2,3].

This study allowed to conclude that PL variations and color intensity can be used for the quantification of H₂O₂ in contact lens care solutions.

[1] J.M. Sharon et al., European Union Risk Assessment Report. Hydrogen Peroxide, 2003, pp. 1-258.

[2] Y. Wang, C. Zhang, X. Chen, B. Yang, L. Yang, C. Jiang, Z. Zhang, *Nanoscale* 8(11), 2016, pp. 5977-5984.

[3] J. Yao, K. Zhang, H. Zhu, F. Ma, M. Sun, H. Yu, J. Sun, S. Wang, *Anal. Chem.* 85(13), 2013, pp. 6461-6468.

- **14966 | THE IMPACT OF (OPPORTUNITY AND NECESSITY) ENTREPRENEURSHIP ON ECONOMIC GROWTH: DOES HUMAN CAPITAL MATTER?**

Rodrigues, Daniela R., Faculdade de Economia da Universidade do Porto, Portugal
Teixeira, Aurora A. C., Faculdade de Economia da Universidade do Porto, Portugal

Entrepreneurship is generally defined as the creation of new firms and according to literature, it is the process by which new enterprises are founded and become viable. Although considerable research has been devoted to the study of the impact of entrepreneurship on economic growth, fewer studies have analyzed the impact of the types (opportunity vs necessity) of entrepreneurship on economic growth. Moreover, the latter set of studies overlooked the relevance of human capital as mediating factor in the relation between (types of) entrepreneurship and economic growth.

The aim of the present study was to fill in the above mentioned gap, by assessing the extent to which the direct and indirect impact of (the types of) entrepreneurship, via human capital, matters for countries' economic growth.

In methodological terms, we resort to fixed effects panel data estimations, involving a large set of (OECD and non-OECD) countries, over a relatively long time span (1990-2016).

The results suggest that total entrepreneurship have a positive impact on economic growth. Distinguishing between types of entrepreneurship, there is clear evidence that opportunity entrepreneurship fosters economic growth, whereas necessity entrepreneurship inhibits it. Interestingly, human capital tends to mitigate the negative impact of necessity entrepreneurship on economic growth. In the case of opportunity entrepreneurship, the direct positive impact observed is reduced in contexts characterized by high levels of human capital, which might reflect increased opportunity costs.

- **14967 | R&D, Managerial Effort Allocation and Agency problems: a Real Options approach**

Borges, Nuno, Faculdade de Economia da Universidade do Porto, Portugal

Pereira, Paulo, Faculdade de Economia da Universidade do Porto, Portugal

In this research, we produced a two-stage managerial decision-making real options model to study the agency dynamics associated with firm R\&D investment.

We develop a dynamic model for an optimal compensation package that induces managers, who are assumed to actively impact the value of the projects they manage, to behave on the same wavelength of shareholders, mitigating existent agency issues. Our work allows us to contribute to various fields of literature, ranging from agency theory and corporate governance, to the literature on strategic investment policy.

From our model, we find that the optimal compensation package is responsible for aligning the effort solutions of both players, as well as their investment timing decisions in R\&D projects. Additionally, we show that heterogeneous managerial skills imply different solutions for the players' optimal investment decision and effort allocation decisions, but the optimal compensation package is independent of the managerial skill set. Moreover, we find that in the presence of higher volatility, the firm's investment trigger for a R\&D project is lower and firms invest sooner, going against standard Real Options literature. When the optimal compensation package is designed, the current state of the industry affects the investment decision (i.e., the trigger is shown to depend on the state variable) so that a firm in the early stages of its life-cycle tends to invest sooner than if in a mature stage. Finally, our model endogenously explains the competitive dynamics of an industry where incumbent firms tend to be surpassed by outsiders while competing for innovation, i.e., we show why a firm has an increasing difficulty in maintaining its innovation-leading position throughout its life-cycle.

- **14972 | Contexts, paths and effects of the practices of the U.Porto Pedagogical Innovation Office**

Vieira, Ismael C., Faculdade de Psicologia e Ciências da Educação, Portugal

Pedagogical innovation is an increasingly present and pressing issue in all levels of education as a way of adjusting education and training to the needs felt by societies and economies of the present and future.

The present study, my master thesis (2018), had as main objectives the systematization of pedagogical innovation practices of the Pedagogical Innovation Office and an evaluation of the effects of the teacher training program of the University of Porto, in order to perceive the changes in pedagogical practice.

The Pedagogical Innovation Office, operating since 2015, has dedicated its activity to the improvement of teaching and learning in the pedagogical area at the University of Porto. It maintains a set of initiatives and programs which contribute to the transformation of pedagogical practices at the higher education level. It stands out at the teachers training level the program of training in areas such as personal skills, assessment methods, new pedagogical approaches and educational technologies. At the level of the incentive to innovation it promotes, finances and rewards annually the Projects of Pedagogical Innovation, the Pedagogical Excellence Award and the "InovPed" Curricular Units.

The results of a survey conducted this year of 2018 show us that teachers who attend to pedagogical training stare pedagogical innovation in a good and positive way. Our main conclusions show that due to be a new theme in higher education and the fact that is difficult to change from a traditional practice to new models, there are different perspectives of what is considered pedagogical innovation or not. Some changes stated in the study are more changes in continuity than real changes towards a full pedagogical innovation. Despite the work of the U.Porto Pedagogical Innovation Office, there are different rhythm in adoption of pedagogical practices and not every changes are real innovative.

- **14977 | Allergens expression in *Betula pendula* pollen under atmospheric pollution influence**

Póvoas, Luís F.C., Faculdade de Ciências da Universidade do Porto, Portugal

Pereira, Susana, Faculdade de Ciências da Universidade do Porto, Portugal

Séneca, Ana, Faculdade de Ciências da Universidade do Porto, Portugal

Pissarra, José, Faculdade de Ciências da Universidade do Porto, Portugal

Abreu, Ilda, Faculdade de Ciências da Universidade do Porto, Portugal

Previous work showed an increase in allergen reactivity with patient sera in pollen exposed to different pollutants. *Betula pendula* pollen, exposed to atmospheric pollutants, was used to determine changes in intracellular accumulation and in the transcription of two major allergens, Bet v 1, a pathogenesis-related protein member of the PR-10 family, and Bet v 2, a major pollen allergen, profilin. Allergens were located in pollen by immunofluorescence microscopy and transmission electron microscopy and labelling was most abundant in the cytoplasm and external wall. Differential gene expression was ascertained by Real-Time Quantitative Reverse Transcription PCR. These changes were observed after exposing the pollen to a controlled atmosphere in an environmental chamber system enriched with various levels of nitrogen dioxide (NO₂) and ozone (O₃), which are two of the most abundant aerosol pollutants in industrialized countries. Preliminary results suggest a possible influence of pollutants, particularly of ozone. The interaction between pollen allergens and gaseous pollutants seem to lead towards an increase in pollen's allergenic potential.

- **14978 | Antimycobacterial effect of selected chloroquine-based ionic liquids**

Bento, Clara M., I3S, Portugal

Silva, Tânia, I3S, Portugal

Moreira, Ana C., I3S, Portugal

Teixeira, Cátia, LAQV/REQUIMTE, Portugal

Ferraz, Ricardo, ESS/IPP, Portugal

Prudêncio, Cristina, ESS/IPP, Portugal

Gomes, Paula, FCUP, Portugal

Gomes, Maria Salomé, ICBAS, Portugal

Mycobacteria from the *Mycobacterium avium* complex act as opportunistic pathogens and infect patients with a compromised immune system namely patients co-infected with HIV, with cancer or immunosuppressed for the purpose of organ transplant. In the host, mycobacteria proliferate inside phagocytic cells, such as macrophages. There, they control the intracellular vesicular trafficking by inhibiting the phagosome-lysosome fusion, which allows these bacteria to escape the lysosomal acidic environment and to have access to nutrients.

Chloroquine (CQ) is a 4-aminoquinoline antimalarial, which has an inhibitory effect in the viability of *M. avium* extracellularly and inside mouse macrophages. Recently, ionic liquids (IL) have gained much attention in the area of drug development as they can potentially be used to overcome unfavorable properties of some drugs, like solubility or polymorphism.

The aim of this study is to evaluate the capacity of CQ-based ionic liquids and their equivalent covalent compounds to inhibit the viability and growth of *M. avium* in axenic culture and inside bone marrow derived macrophages (BMM). Our preliminary results indicate that the tested IL cause a significant dose-dependent decrease on the extracellular mycobacterial viability. We are currently testing those compounds for their anti-mycobacterial effects inside infected BMM, as well as for their toxicity against these host cells.

In the future, we plan to investigate the mechanisms behind the anti-mycobacterial effect and identify the most significant structure-function relationships, in order to develop new and better drugs against mycobacterial infections.

- **14985 | The relationship between the perceived workload and the withdrawal intentions of portuguese young auditors**

Rodrigues, Pedro C., Faculdade de Economia da Universidade do Porto, Portugal

This study examines how perceived workload influences Portuguese young auditors' withdrawal intentions from the job, the organization and occupation. Furthermore, the practice of a hobby is suggested as a moderator. Data was collected through a questionnaire delivered to a national sample of auditors, constituted by 138 Portuguese young auditors from several international auditing firms operating in Portugal. To test the hypotheses, stepwise Multiple regression analyses were performed. The results indicate that perceived mental and time pressure are the most experienced workload factors among Portuguese young auditors, but perceived frustration was the main predictor of the three withdrawal intentions. Hobby practice showed a significant association with the job and organization withdrawal intentions, possibly functioning as a buffer, even though perceived workload superimposed. The items which expressed "thinking of quitting" were higher rated than the ones which expressed "real actions for changing their current situations" (intent to search and intent to quit). Not all workload dimensions are considered significant for each one of the withdrawal intentions types. Through the results was possible to conclude the most significant dimension is Frustration, being highly significant ($p < 0,001$) to all the withdrawal intentions types. Results revealed that hobbies can act as a moderator of the withdrawal intentions, buffering the negative effects of perceived workload. Only 57,2% of the individuals, 79 out of 138, has time for hobby practices. Moreover, 46,8 (almost half) practice their hobbies twice a week (maybe during the weekends), being the most common hobbies: Gym activities and Football.

- **14987 | Psychological impact of physical exercise in postmenopausal women**

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Torres, S., Faculdade de Psicologia e Ciências da Educação, Portugal

Póvoas, S., Faculdade de Desporto da Universidade do Porto, Portugal

The practice of regular physical exercise provides the achievement of important gains in the health of individuals. Its effects have been studied in the climacteric, however, further investigation is needed to elucidate the psychological impact on postmenopausal. Therefore, the present study sought to fill some gaps in the research, exploring the psychological impact of handball training in postmenopausal women. A mixed methodology was adopted, with a longitudinal design. The sample consisted of 73 participants, aged 49 to 79 years; 41 were assigned to the experimental group (EG) and 32 to the control group (CG). Participants were evaluated during three moments: at the baseline, 4 and 12 months after the beginning of the training. The results suggested significant improvements in global cognition, as well an increase in self-esteem, well-being index and executive functioning, these only during the first four months. Additionally, through the participants' perception (assessed in focus group), we mainly found positive changes, both at physical and psychological level, as well as a positive evaluation of the trainings. Despite this perception, the quantitative data don't reflect significant improvements in some variables, namely weight, body appreciation, emotional area, emotional regulation and eating behavior. Globally, this program seems to have beneficial effects on psychological outcomes, although not in all domains. Given the exploratory nature of some included variables, this study requires replication.

- **14989 | Exposure to abuse and food insecurity among Portuguese older people**

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Dias, I., Faculdade de Letras da Universidade do Porto, Portugal

Lopes, A., Faculdade de Letras da Universidade do Porto, Portugal

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In a context marked by a recent financial crisis that might have affected older people's health and quality of life, it would be expected the co-occurrence of old-age vulnerabilities. Food insecurity and abuse are expected to share an economic adverse environment. The current study aims to assess how exposure to abuse relates to food insecurity among elder urban-dwellers of Porto.

Members from the EPIPorto cohort aging 60 years or more were invited to participate in the Harmed study. Of the eligible participants, 677 participants were included in this research. Trained interviewers administered a structured questionnaire on sociodemographic, economic and health-related characteristics and exposure to abuse. Exposure to abuse was self-reported considering 11 items on psychological, 24 items on physical (17 items for physical and 7 for injuries), 9 items on financial and 8 items on sexual violence and 13 items on neglect. Household food security status was assessed through the short-form 12-month Food Security Scale, in which the households are classified as having high or marginal food security, low food security and very low food security.

Overall, 23.9% of participants reported to have experienced abuse and 6.6% reported to be food insecure in the last 12 months. Food insecurity was more prevalent among individuals who suffered abuse in the last 12 months than in those who did not suffer. After adjusting for gender, marital status and household income, a significant association was found between abuse and food insecurity (OR: 2.00; 95% CI: 1.01-3.98).

Our results showed that older adults who experienced abuse were two times more likely to belong to food insecure households. Public health policies and actions to mitigate these adverse exposures in this population group should be developed and improving socioeconomic conditions and specific legislation against elder abuse would have potential to succeed in promoting health and well-being of this population.

- **14995 | Relations between Oriental Artistic-Cultural Aspects and Contemporary Portuguese Art**

Pimentel, Rita M. da S. de Mesquita, Faculdade de Belas-Artes da Universidade do Porto, Portugal

Throughout history, Portugal was intrinsically linked to the East through colonization processes that allowed the exchange of products, culture and knowledge. In the contemporary portuguese artistic context, it's possible to establish relations with the East in certain works, but not nearly as many as one would expect considering the historical factors that linked the two cultures. In this sense, the aim of this investigation is to try to understand how these relations can be established indirectly (by us) and directly (by the artists). Through the analysis of four case studies (Álvaro Lapa, Ana Hatherly, Sofia Areal and Vítor Pomar), we intend to understand how aspects from the oriental culture and art are manifested in contemporary portuguese art. These manifestations may arise, in some cases, in formal aspects of the artworks (such as color, expression, etc.), while in others, they are assumed in the conceptual thought or through the creative process.

Keywords: Contemporaneity; Portuguese Art; East; Art; Culture.

- **14996 | Low redshift constraints on energy-momentum-powered gravity models**

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Martins, Carlos J. A. P., Centro de Astrofísica (CAUP), Portugal

Chiti, F., Liceo A. M. Enriques Agnotetti, Italy

Silva, Beatriz S. A., Instituto Superior Técnico, Portugal

There has been recent interest in the cosmological consequences of energy-momentum-powered gravity models, in which the matter part of Einstein's equations is modified by the addition of a term proportional to some power of the energy-momentum tensor, in addition to the canonical linear term. Here we use recent background cosmology data, specifically from Type Ia supernovas and Hubble parameter measurements, to quantitatively constrain the low redshift behavior of these models, under two different assumptions. Firstly, one may treat these models as phenomenological extensions of the standard Λ CDM, in which case the additional model parameters can be constrained, and we do this for some specific cases. Secondly, it has been proposed that these models may be able to explain the recent acceleration of the universe without invoking a cosmological constant (i.e., with only a matter component), but we show that this possibility is ruled out by current data. In the first case, we also discuss how the models may be further constrained by future observations of the redshift drift.

- **14997 | Too warm for the sea urchin? The effect of temperature on the metabolism and fitness of the European purple sea urchin, *Paracentrotus lividus***

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Freitas, Vânia, CIIMAR, Portugal

Campos, Joana, CIIMAR, Portugal

Arenas, Francisco, CIIMAR, Portugal

The European purple sea urchin *Paracentrotus lividus* (Lamarck, 1816) is a very abundant species in the tidal rocky shores of Portugal. Due to the high economic value of its roe, regular harvests of sea urchins for food industry have abruptly increased in the North of Portugal in the recent years, but with an unappropriated regulation it may lead to a depletion of the natural populations. To define a sustainable management plan requires prior basic knowledge on the population response to environmental conditions. This is particularly important in the context of climate change, since rising temperatures may affect the metabolism and fitness in ectothermic organisms.

In this study, we investigated the physiological performance of the European sea urchin in terms of mortality, growth, feed intake and respiration rates in relation to nine constant temperatures from 8 to 30°C. The general geographic distribution of the species was also modeled in accordance with the worst predicted climate change scenario for the Mediterranean-Atlantic zone.

The results show a) a LT50 of 29.9°C in three months; b) a similar thermal optimum for growth and feed intake rates, of about 17°C; c) the respiration rate exponential increase with the temperature up to 30°C; d) a lower activation energy of well fed organisms and e) a decrease in habitat suitability for *P. lividus* from 0.5 to 0.2 in Portugal in 2100, with consequences not only at the population level but also for the commercial harvesting. We then anticipate that only a very cautious stock management plan based on scientific monitoring can assure a sustainable harvesting of the Portuguese sea urchin population and avoid its collapse under the most dramatic climate change scenario previewed by the IPCC.

Key words: sea urchin, *Paracentrotus lividus*, growth, feed intake, respiration, thermal performance, activation energy.

- **14999 | Presentism and stress among nurses of North Portugal**

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Queirós, Cristina, Faculdade de Psicologia e Ciências da Educação, Portugal

Borges, Elisabete, Escola Superior de Enfermagem do Porto/CINTESIS, Portugal

Abreu, Margarida, Escola Superior de Enfermagem do Porto/CINTESIS, Portugal

Introduction/aims: Nursing is a stressful profession and this chronic job stress affects nurses' health and the quality of care provided (Albuquerque, 2018; Tao et al., 2018). The socioeconomic crisis changed absenteeism patterns (Leinonen et al., 2018), and nurses are working even sick, which is the phenomenon of presentism (Rainbow & Steege, 2017). We aim to identify presentism and stress levels among Portuguese nurses, and stress as a presentism predictor.

Methods: Within the INT-SO project we applied to 340 nurses, the Nursing Stress Scale (GrayToft & Anderson, 1981), the Stanford Presenteeism Scale (Koopman et al., 2002) and a sociodemographic/occupational questionnaire, after formal authorization.

Results & Discussion: We found that 73% of nurses considered their work as stressful and 87% already worked ill. Moderate levels of presentism were found, higher in the completing work dimension than in the avoiding distraction dimension, and moderate levels of stress at work mainly related to work overload, management of death and physical environment. Age and job experience seem to protect from avoiding distraction, and stress sources are positively correlated with this dimension, predicting 14% of presentism. These data are consistent with studies on work stress and presentism in nurses (Mahli et al., 2016; Umann et al., 2014).

Conclusions: It is crucial to apply stress management programs, since the presentism has high costs for nurses, for organizations and for patient safety (Ferreira et al., 2018; Rainbow & Steege, 2017). Moreover, it is necessary to study more the interactions between presentism and job stress sources, as well as to standardize the definition of presentism, that according Koopman et al. (2002) is associated with the capacity to complete work, even though it is limited by illness, while other instruments measure this phenomenon in a negative perspective (ex: to be limited in its work due to illness).

- 15000 | Technological and safety characterization of bacteriocinogenic lactic acid bacteria

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Helena Albano, ESB - UCP, Portugal

Paula Teixeira, ESB - UCP, Portugal

Lactic acid bacteria (BAL) are increasingly being used at the level of the food industry, contributing to the advancement of food safety. As such, the objective of this study was to identify lactic acid bacteria (s) with bacteriocinogenic activity and their characterization in technological and safety terms, in order to determine their potential for application in food matrices. In this study, we evaluated the antimicrobial activity of a set of 11 isolates, among which only 1 evidenced bacteriocinogenic capacity against *Enterococcus faecalis* ATCC 29212, *Enterococcus faecalis* DSMZ 12956, *Listeria monocytogenes* 7946 and *Listeria monocytogenes* 7947. Identification was performed by amplification of 16S rRNA of the isolate of interest and its subsequent classification in terms of technology, safety and tolerance to conditions similar to the gastrointestinal tract. The results allowed to conclude that *Lactobacillus plantarum* 1A5 has bacteriocinogenic activity. In technological terms, it doesn't show proteolytic or lipolytic activity, it doesn't produce EPS, and it presents low autolysis (23.2%) as well as small diacetyl and acidification, being resistant to 6% NaCl. Based on the tolerance tests for conditions of the gastrointestinal tract, it was found that *Lb. plantarum* 1A5 was resistant, evidencing its possible probiotic character. In terms of safety, the strain is nonhemolytic, not evidencing DNase, gelatinase nor lipase. Regarding the virulence factors, *Lb. plantarum* 1A5 was negative for most of the genes, however, showing the presence of *gelE*, *cylB*, *cylM* and *cyl LL*. It has been found *Lb. plantarum* 1A5 is sensitive to the antibiotics tested. In general, in vitro characterization has demonstrated the possibility of using the strain in the food industry. However, it would be necessary to conduct studies in different food matrices, in order to validate their introduction.

- **15001 | On the semantics of modal adverbial adjectives**

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Even after several studies, both the definition and classification of adjectives are still being discussed among the semanticists. Despite the lack of consensus, the division between qualificative and relational adjectives seems to be generally well-accepted. Still, some adjectives, which do not fit in one of these two classes, remain little studied. Recognizing this gap in the literature on adjectives, this work focuses, mainly, on the study of another type of adjectives, the modal adverbial adjectives (Demonte, 1999), which essentially describe how a concept applies to a noun, in European Portuguese. Thus, the presentation aims to present an initial study about this subclass of adjectives, in an attempt to describe them, from a semantic point of view. For this, three parameters were selected: the position of the adjective when combined with a noun, which, despite being a criterion more over the syntactic scope, proved to be a relevant parameter, since it can cause changes of meaning; the strategies used to convey negative sentences; and, finally, the presence of elements that may reveal the scalar character of these adjectives (quantifiers and totality or partiality adverbs). The investigation has led to the conclusion that adjectives do not generally have a homogeneous behavior. However, certain behavioral patterns bring deontics closer to each other and away from the other adjectives. The results also led to the need to focus on the behavior of adverbs, namely the totality and partiality adverbs, since they were responsible to induce different readings when combined with different adjectives. The studied adjectives were selected because of the type of modality they represent, in an attempt to collect, at least, one adjective representative of each of the five categories that Oliveira e Mendes (2013) have proposed for modality - epistemic, deontic, internal and external to the participant and desiderative.

- **15006 | High-throughput cell-in-gel microarray platform for the analysis of cell behaviour in 3D matrices**

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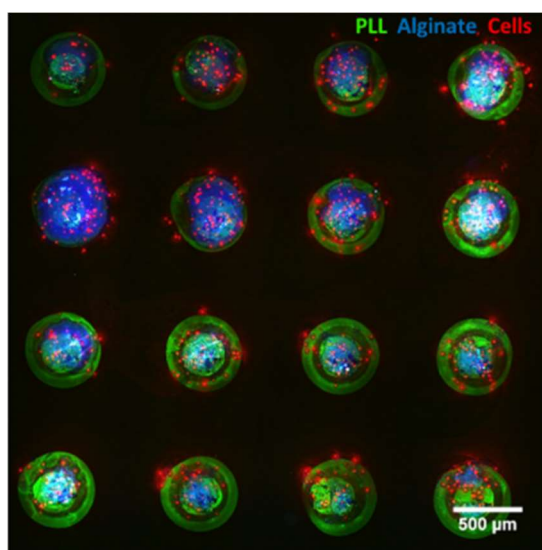
Cell-based high-throughput screening (HTS) has been gathering attention for the past few years, as it overpasses some of the limitations of traditional cell-based in vitro assays. In particular, it enables the recreation of physiologically-relevant 3D microenvironments for the analysis of cell behaviour, in a fast and reproducible manner, using minimal volumes of often expensive reagents, materials and cells.

The aim of this work was the development and validation of cell-in-gel 3D microarrays, for future establishment of a HTS platform to study cancer-associated epithelial-to-mesenchymal transitions (EMT). Building on previous studies, a robotic spotting system was used to print nanoliters of cell-laden alginate solutions, at defined locations, on chemically-modified glass slides, yielding arrays of 3D microspots. After spotting and hydrogel crosslinking by internal ionic gelation, multi-well slides allowed for direct culture and on-slide assays.

Having established the right conditions for fabricating cell-in-gel 3D microarrays, we aimed at validating the platform by evaluating array stability and analysing epithelial cells viability and morphogenesis.

Additionally, the use of alternative alginate crosslinking methodologies was also investigated. Both external gelation and photo-polimerisation strategies yielded promising preliminary results, presenting some advantages that should be further explored in future studies.

Taken together, results from this work represent an important step towards the development of a new 3D cell-in-gel HT platform for screening cell behaviour. Besides the study of EMT, we believe that such platform could be translated into different fields, as an attractive tool to rapidly test multiple conditions in a miniaturised, biologically relevant 3D setting.



Cell-in-gel 3D microarray

- **15007 | Potential of estuarine salt marsh plants for phytoremediation of bezafibrate and paroxetine**

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Continued worldwide industrialization has led to an increased release of several types of pollutants to the environment, including contaminants of emerging concern, such as pharmaceuticals. Most water treatment stations are not equipped to deal with these pollutants, increasing their discharges in the environment.

Estuaries are sinks for contaminants, being one of the most affected environments by the release of these pollutants. Thus, new remediation strategies for these areas are imperative.

This study aimed, firstly, to carry out a survey of the presence of paroxetine and bezafibrate in vegetated (rhizosediments) and non-vegetated sediments from two Portuguese estuaries. Secondly, it aimed to evaluate the potential of a salt marsh plant (*Phragmites australis*) and its rhizosphere microorganisms to degrade the selected pharmaceuticals, including in the presence of another pollutant, Cu, in laboratory experiments.

In the first survey, paroxetine was detected in the three rhizosediments whereas bezafibrate was detected only in two. But none of the compounds was detected in non-vegetated sediments, indicating that the plant had a role in the distribution of these compounds in estuarine areas.

Considering the laboratory experiments, the plant and its rhizosediment, when combined, showed a removal efficiency of 51% for bezafibrate and 90% for paroxetine in the absence of Cu. In the presence of Cu, a removal efficiency of 75% for bezafibrate and 95% for paroxetine was observed, which demonstrates that in some cases Cu might influence the retention/degradation of the compounds.

Overall, the plant and mostly its rhizosediments and the microorganisms associated have potential to remove these contaminants from estuarine areas and eventually degrade the selected compounds, a feature that requires more research.

Acknowledgments: R&D&I INNOVMAR (NORTE-01-0145-FEDER-000035), research line ECOSERVICES, supported by NORTE2020, through the European Regional Development Fund

- 15014 | From GTA: San Andreas to GTA V: Why are black narratives in digital games always criminal and marginalized?

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Stuart Hall (1994) points out the existence of two ways of understanding the formation of the black people's identity consciousness against colonialism. On one hand, there is a movement that starts from the members of this group looking for their representativeness before the domination imposed by the white culture. There was, therefore, a need to create artistic manifestations that placed them as protagonists of their own actions. It was, of course, a way of perceiving themselves, especially at the beginning of the post-colonial period. This same oppressive society, however, preaches the "erasure" of black culture, so that they are situated in a limbo: either they assume themselves as individuals belonging to the white society in order to reinforce the supremacy of that society, or disappear from it, making themselves culturally invisible. Hooks (1992), endorsed by Acevedo and Nohara (2008), states that the absence of blacks in cultural material produced by "Caucasian society" impairs the identity formation of these individuals. Since they do not see themselves in products that they consume, they understand themselves as inferior beings, culturally marginalized and incapable of self-valorization. Among the many cultural products in which the blacks are in the background or do not even appear, are the electronic games. Although they are currently one of the most influential media around the world, including other forms of media such as TV, film and literature (Arseth, 2012), video game content is not intended for the black population. Or, when they are, they start from the bias of the marginalization of the black, especially of the man, as can be seen in the GTA: San Andreas and GTA V. This research work therefore aims to show how these two games corroborate the social belief that people with that skin color are criminals by nature.

- **15015 | Analysing the peripheral nerve tissue using advanced discretization techniques**

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The study of the biomechanical response of peripheral nerves is crucial to improve the repair/regeneration process of the nerve after injury, since nerve injury reduces life quality and has an extensive impact on the global productivity and economy. It is important to understand if the numerical techniques available in the literature are capable to simulate the structural response of peripheral nerves. Thus, this work uses the finite element method (FEM) and two meshless methods (RPIM and NNRPIM) to analyse the structural behaviour of a peripheral nerve under constant traction force. The main advantage of RPIM and NNRPIM over the FEM is its ability to construct the virtual geometric model using directly medical images (from computed tomography scan or magnetic resonance imaging). Thus, inspired on a real nerve bifurcation, it was constructed a 3D model of a sciatic nerve bifurcation in the lower thigh. Then, the model was submitted to a traction load and the resulting stress/strain fields were obtained. The structural analysis was performed using FEMAS (cmech.webs.com). The results obtained with the three discrete methodologies were very similar. The stress concentrations are observed always in the same region and the displacement results are concordant. It was verified that FEM, RPIM, and NNRPIM produce very similar results, allowing to conclude that these methods are appropriate numerical tools to analyse the biomechanical behaviour of peripheral nerve tissue.

Acknowledgements: The authors truly acknowledge the funding provided by Fundação para a Ciência e a Tecnologia (Portugal), under project funding MIT-EXPL/ISF/0084/2017 and project NORTE-01-0145-FEDER-000022 - SciTech - co-financed by NORTE2020, through FEDER.

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- **15017 | Opioid receptor signalling pathways in a pain facilitatory area of brain upon cessation of chronic opioid treatment**

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Opioids remain the gold standard for the treatment of moderate to severe pain. However, opioids also cause a paradoxical effect known as Opioid-Induced Hyperalgesia (OIH). The exposure to opioids induces counter-adaptations at the μ -opioid receptor (MOR) and its intracellular signalling pathways. It is not known whether these alterations remain after opioid cessation. Here we aim to study the expression of MOR and several molecules involved in MOR signalling during OIH in a brain area involved in descending pain facilitation, the dorsal reticular nucleus (DRt). We evaluated the expression of MOR and the phosphorylated cAMP response element binding protein (pCREB) and the phosphorylated extracellular signal-regulated kinases (pERKs), at a timing of OIH occurrence and complete reversal of OIH (Post-OIH).

Male Wistar rats were implanted with osmotic mini-pumps for the continuous release of morphine (45 μ g-1. μ l-1.h-1) or saline. One week later, one group of animals (OIH) was euthanized while in a second group (Post-OIH), mini-pumps were removed and the animals were euthanized 2 weeks later. The von-Frey and Hotplate tests were used to evaluate mechanical and thermal sensitivity, respectively. The expression of MOR, pCREB and pERKs at the DRt was evaluated by immunohistochemistry.

One week after morphine infusion, animals showed mechanical and thermal hypersensitivity and an increase of MOR, pCREB and pERKs expression at the DRt. Two weeks after cessation of morphine, behavioural hypersensitivity was completely abolished, MOR expression was not altered while pCREB and pERKs expression was increased.

Our results suggest that intracellular cascades remain altered in a pain modulatory area after cessation of morphine, which might impact negatively on the effects of future pain treatments with opioid.

- **15020 | Structural analysis of dental implants using advanced discretization techniques**

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Dental Implants are a treatment solution for dental trauma or periodontal diseases. In order to predict its structural behaviour, it is necessary to develop discrete numerical methods to simulate how an implant will behave in terms of stress and strain in the mandibular bone subjected to masticatory forces. Finite Element Method (FEM) is one of the most popular discrete numerical method available in the literature. Nowadays, FEM is widespread to a variety of science fields, such as dental biomechanics. More recently, other numerical techniques were developed, such as meshless methods. Thus, in addition to the FEM, this work uses a meshless method [1] to analyse the structural response of an implant. The literature shows that meshless methods are more accurate than the FEM, and that they allow to obtain smoother stress/strain fields. In this work, an implant was created by a 3D CAD (Computer Aided Design) tool - SolidWorks © - and then analysed in the academic software FEMAS (cmech.webs.com). The implant was submitted to several load scenarios and the corresponding stress/strain fields were obtained for both FEM and meshless analyses. With the results, it was verified that the depth of the implant in the mandibular bone positively influences the stress and strain distribution in the implant during the chewing movements. Furthermore, the results show that both formulations (FEM and meshless) produce similar results.

Acknowledgements: The authors truly acknowledge the funding provided by Fundação para a Ciência e a Tecnologia (Portugal), under project funding MIT-EXPL/ISF/0084/2017 and project NORTE-01-0145-FEDER-000022 - SciTech - co-financed by NORTE2020, through FEDER.

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- 15023 | “Is running aerobic performance influenced by a jaw advancement device?”

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The maximum oxygen consumption ($\text{VO}_{2\text{max}}$) is one of main physiological variables for the assessment of the aerobic physical fitness and has been widely used for evaluating running training and performance. The jaw advancement has been mentioned as enhancer of upper airway volume and probably contributing for the improvement of ventilation and aerobic capacity. Our purpose was to study the effect of a mandibular advancement device in running aerobic performance variables of healthy subjects with regular sports practice. Nine football players performed two testing sessions of a continuous incremental protocol of 7 x 4 min (1 km/h increments) in a treadmill (H/P/ Cosmos Quasar 4.0, Nussdorf, Germany) until to exhaustion, once with a placebo and another with a jaw advancement device. This device was made in models of the mandibular arch with 25% of the maximum individual protrusion of subjects and each one was individualized and adapted for each participant. The oxygen consumption (VO_2), minute ventilation (VE), heart rate (HR) and respiratory frequency (RF) were determined for both experimental conditions in three exercise intensity domains. The results showed an increase in VO_2 , VE and FR values when the jaw advancement device was used, but only at the severe domain, without significant changes at low to moderate and high running intensities. The ventilatory capacity may limit the $\text{VO}_{2\text{max}}$, but a decrease in airway resistance during physical activity may decrease the work of respiratory muscles and improve the blood flow to skeletal system, which can be essential in exercise tolerance. Meanwhile, enhancements in VO_2 values, associated with increments in airway and ventilation, might be particular important at maximal efforts when energetic demands increases. Our study demonstrates that a jaw advancement device positively influences some of the variables analysed and partially supports that the use of these devices has an ergogenic effect in running aerobic performance.

- **15025 | The biomechanical simulation of the mandible bone using meshless methods**

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Daily, the mandible bone is submitted to a variety of load scenarios. It is important to understand its structural response to those load cases. Thus, using discrete numerical techniques, this work aims to study how the mandible bone responds to centred and non-centred punctual loads (simulating masticatory loads). The finite element method (FEM) is a well-known discrete technique, already applied to several engineering fields. However, FEM possesses some numerical drawbacks. Hence, in order to solve such difficulties, the computational mechanics community started to focus its attention in a new class of discrete methods - the meshless methods [1]. These methods do not require any structured mesh, allowing to build the virtual geometric model directly from medical images. In this work, FEM and meshless methods are used to analyse the structural behaviour of the mandible. A 3D model was built using medical images and the biomechanical analysis was performed using FEMAS (cmech.webs.com). In the end, for each considered load scenario a corresponding stress/strain field was obtained. Then, it was verified that the load case influences significantly the stress/strain field. In addition, the mandible deformation was also analysed, allowing to understand how the loads influence the mandible misalignment. Although the RPIM produces slightly higher values when compared with the FEM, in the end, it was verified that both methods present very similar results.

Acknowledgements: The authors truly acknowledge the funding provided by Fundação para a Ciência e a Tecnologia (Portugal), under project funding MIT-EXPL/ISF/0084/2017 and project NORTE-01-0145-FEDER-000022 - SciTech - co-financed by NORTE2020, through FEDER.

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- **15026 | Simulating Human Chromosomes Using Meshless Methods**

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Biomechanical computational simulation allows a non-invasive virtual approach to first perceive the functioning and resistance of structures, avoiding the ethical problems of in-vivo/in-vitro experiments. Nowadays, light microscopy permits to visualize the shape of human chromosomes (HC) allowing high detailed geometric models. Also, using well-studied micro measurement techniques, the mechanical properties of HC can be obtained [2], such as the Young's modulus: 400 ± 20 Pa. This work aims to study the structural behaviour of HC using meshless methods: an advanced discretization numerical technique [1]. The models are discretized and numerically analysed using the Radial Point Interpolation meshless method [1] and, for comparison purposes, the Finite Element Method. Geometric models of human-based chromosomes were created using FEMAP (student edition) and the first free vibration modes of each model were obtained using FEMAS academic software (cmech.webs.com). Transforming these modes into fictitious deformation fields, the fictitious von Mises stress fields were obtained, allowing to understand the potential locations in which stress concentration and potential deformation will occur. Computational biomechanics applied to the healthcare is relevant and will surely include chromosomes' study for the next years since it is currently a gap.

Acknowledgements: The authors truly acknowledge the funding provided by Fundação para a Ciência e a Tecnologia (Portugal), under project funding MIT-EXPL/ISF/0084/2017 and project NORTE-01-0145-FEDER-000022 - SciTech - co-financed by NORTE2020, through FEDER.

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- **15030 | The numerical analysis of hemodynamics in the vicinity of blood clots**

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The study of haemodynamics is important to understand some diseases and how to treat them. One way to perform this type of analysis is through biomechanical computational simulation using discrete numerical techniques, such as Finite Element Method (FEM) or Meshless Methods [1]. In comparison with the FEM, the literature shows that meshless methods are capable to provide more accurate and smoother variable fields. The aim of this work is to compare the velocity profile of some discretized 2D models of an artery (with and without a clot) with different shapes, using the FEM and radial point interpolation meshless methods. The models were constructed using the student version of FEMAP and the flow theory of Zienkiewicz (suitable to simulate the flow of viscous-elastic fluids) [2], a rate deformation theory, was considered. The flow theory was initially developed for FEM, however, in this work, it was successfully combined with radial point interpolation meshless methods. The full formulation is now available in the academic FEMAS software (Finite Element and Meshless Analysis Software: cmech.webs.com), the software used to perform the numerical analysis. In the end, it was possible to observe that for all models, the presence of a clot creates a disturbance in the flow, increasing its velocity in the area where blood is allowed to pass. The results are in accordance with the expected outcome. This preliminary work allowed to better understand the effect of a blood clot in haemodynamics.

Acknowledgements: The authors truly acknowledge the funding provided by Fundação para a Ciência e a Tecnologia (Portugal), under project funding MIT-EXPL/ISF/0084/2017 and project NORTE-01-0145-FEDER-000022 - SciTech - co-financed by NORTE2020, through FEDER.

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- **15032 | Dance and music Influence on physical activity of children in school period**

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The society's development and modernization have boosted the emergence of serious worldwide epidemics, such as obesity and sedentarism, enhancing the importance of Physical Activity (PA) that, in this way, rises as one of the main tools to promote a good lifestyle, being part of the World Health Organization's recommendations. Physical Education (PE) is the only subject present in a school's curriculum that, in one side, may respond to the Sports' training and the education's demands and, on the other, promote healthy life habits.

With this study we intend to investigate the effect of an intervention program based on dance lessons and recess recreational activities supplemented with music in the School's Total Physical Activity of students from six to eight years old, in an educational environment. Our sample consisted in 57 students with ages ranged between 6 and 8 years old and the PA was evaluated resorting to ActiGraph wGT3X-BT accelerometers. A Dance Instructional Unit was applied during 9 weeks in which content and themes of creative dance were approached in a class of 60 minutes per week for each class and four choreographies were taught.

The obtained results revealed that both Dance lessons and the music's presence positively influenced the increase of the children's PA. The recess recreational activities accompanied with random music and music from the Dance lessons delivered higher values of moderate-to-vigorous physical activity (MVPA) than the ones with no music.

We concluded that the days in which the Dance lessons took place were the ones with better results of MVPA (10,32%) and with the lower values of Sedentary Activity (63,22%) when comparing to the days with PE (MVPA: 8,80%; SA: 63,40%) or with no guided physical activity (MVPA: 7,47%; SA: 69,20%). In addition, the extracted results revealed that the MVPA values of the Dance lessons days approached the recommended 60 minutes of PA for the referred ages.

- **15034 | Numerical Analysis of Aneurysms with Finite Element and Meshless Methods**

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The purpose of this work is to study the rupture risk of abdominal aortic aneurysms (AAA) under three different blood pressure conditions. In order to achieve this goal, two 3D discretized models - one of the non-aneurysmal aorta (NAA) and other of the AAA - were developed with FEMAP® student editions, a mesh generator software. The implementation of both models is crucial to understand potential rupture locations of the aneurysm and to comprehend the changes that occur in the vessel. For numerical simulation, it was considered the Finite Element Method (FEM) and a meshless method - the Radial Point Interpolation Method (RPIM) [1], that were implemented in the academic software FEMAS® (cmech.webs.com). In the end of the analysis, it was obtained the levels of principal stresses, equivalent von Mises stresses and displacements. The results suggested that, for the NAA model, the behaviour of the wall does not have a specific region mostly affected by blood pressure. On the other hand, for the AAA model, the variable fields were higher in the posterior wall, in the end of the neck, representing a site of possible rupture. In addition, the results obtained by FEM and RPIM were similar, but the last method provided numerical values more constant and better distributed along the vessel wall. Thus, this work allowed to understand the influence of blood pressure in the vessel wall of healthy and aneurysmal aortas and compare the results between two different discretization methods using the same software.

Acknowledgements: The authors truly acknowledge the funding provided by Fundação para a Ciência e a Tecnologia (Portugal), under project funding MIT-EXPL/ISF/0084/2017 and project NORTE-01-0145-FEDER-000022 - SciTech - co-financed by NORTE2020, through FEDER.

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- **15035 | The structural analysis of a femur bone using a 2D FEM approach**

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This work presents a methodology for the creation of a two-dimensional geometric model of the femur with data obtained from X-ray images. The aim of this work is to evaluate the stress and strain distribution throughout the femur, in order to understand the behavior of the bone in a healthy condition. For that purpose, a 2D model of the femur was constructed using anonymized DICOM files from X-ray images. The numerical analysis was performed using the finite element method. The academic FEM software FEMAS®, developed at Faculty of Engineering of the University of Porto (cmech.webs.com), was used to perform the numerical analysis [1]. It was considered the 2D plane strain deformation theory, which means that only an equivalent thin slice of femur bone (with 1mm thick) was analyzed. Regarding the boundary conditions, it was assumed the femur clamped at the middle of the shaft and proportional forces were applied. Therefore, the magnitude of the variable fields correspond to a qualitative representation of the real stress/strain distributions. The isotropic and elastic model is subjected to three different load cases, consisting of one parabolic distributed load over the joint surface and another parabolic distributed in the trochanter to represent the abductor muscle. Overall, the greater stress is observed in the shaft of the femur, particularly in the cortical bone. Relatively to the strain, it was verified that the cortical and trabecular bone in the shaft and neck of the femur presented higher strain levels.

Acknowledgments: The authors truly acknowledge the funding provided by Fundação para a Ciência e a Tecnologia (Portugal), under project funding MIT-EXPL/ISF/0084/2017 and project NORTE-01-0145-FEDER-000022 - SciTech - co-financed by NORTE2020, through FEDER.

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- **15036 | Influence of KRAS activation in the colorectal cancer immunosurveillance escape**

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The immune system as a host defense system watches the cell growth and division, eliminating cells with antigens different from those present in healthy cells. However, some transformed cells have the capacity to escape the immune system. Genomic instability and some mutations are pointed as possible mechanisms supporting the immune surveillance escape, as is the case of KRAS mutation. This oncogenic mutation is present in about 40% of cases of colorectal cancer and confers to the tumor a greater potential for malignancy. Additionally, it is known to regulate the recruitment, activation, and differentiation of immune cells, such as macrophages and neutrophils, promoting tumor evolution by ensuring leakage to the immune system and increasing the proliferative potential. However, the mechanism which determines this interaction remains unclear. Due to the growing knowledge of different immunosuppressive molecules, it became interesting to investigate if there is an alteration in these molecules related to the KRAS activation. In our work, a series of these molecules were analyzed by flow cytometry in a panel of KRAS mutant colorectal cancer cells in which KRAS was silenced by small interfering RNA. Additionally, the influence of chemotherapy and the IFN- treatment, a non-consensual possible therapy, in the expression of immune checkpoints molecules was also evaluated. Preliminary results suggest that the silencing of this oncogene lead to the alteration of some molecules involved in the crosstalk with the immune system cells, such as macrophages and lymphocytes. Additionally, in some cases, chemotherapy and IFN- administration showed to have some influence on the upregulation of this immune molecules expression, which was impaired by KRAS silencing. In conclusion, KRAS activation seems to be capable of regulating the expression of surface markers which can coordinate and suppress the immune response against cancer cells.

- **15039 | The structural analysis of a molar tooth using meshless methods**

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Abstract: Teeth are submitted to a variety of daily loads, producing stress/strain fields. The geometric disposition and the anatomic shape of the tooth influence the final stress/strain field. If the stress level overcomes the stress limit of the material building the natural tooth (enamel and dentin), the tooth can fracture. Thus, it is important to develop robust and efficient computational techniques to predict the structural behaviour of teeth. This work uses two distinct numerical techniques to analyse the structural behaviour of this bio-structure. One of the techniques is the finite element method (FEM) and the other is a radial point interpolation meshless method [1]. Meshless methods do not need a structured mesh and permit to use the medical images to directly construct the virtual geometric model. Thus, a 3D model of the molar tooth was constructed using medical images and the biomechanical analysis was performed using FEMAS (cmech.webs.com). Then, three loads with different directions with the same magnitude of 75N were applied: a perpendicularly force of 75N was applied to the surface of the tooth to simulate an orthogonal occlusal load and two other forces of 75N were applied tangentially to the surface of the tooth, representing the type of loading caused by bruxism. After the analysis, it was possible to verify that the final stress/strain fields were significantly influenced by the load case. It was verified that both methods present very similar results.

Acknowledgements: The authors truly acknowledge the funding provided by Fundação para a Ciência e a Tecnologia (Portugal), under project funding MIT-EXPL/ISF/0084/2017 and project NORTE-01-0145-FEDER-000022 - SciTech - co-financed by NORTE2020, through FEDER.

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- **15040 | The effect of the endocannabinoid anandamide on granulosa cells**

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The major endocannabinoid (eCBs) anandamide (AEA) has been suggested as biomarker of reproductive potential of male and female gametes. The endocannabinoid system (ECS) has been recognized as a crucial player in human reproduction and changes in AEA levels negatively affect reproductive events, being recognized as a “guardian angel” in reproduction. Cannabinoid-receptor 1 (CB1) was already identified in the granulosa cells (GC) of antral follicles, and in the luteal cells of functional corpus luteum of rat ovary. GC interact directly with the oocyte during its development, being crucial for its reproductive potential. However, neither the ECS was characterized nor AEA effects on GC were depicted. Therefore, the aim of this work was to explore the effects of AEA on COV434 granulosa cell line and on human granulosa cells (hGC) obtained from follicular fluid of patients enrolled in IVF treatments.

Cells were incubated with AEA at different times and concentrations, with or without the antagonists of CB1(AM281) and CB2 (AM630) receptors. Viability and cytotoxicity were evaluated by MTT assay and LDH release. Cell morphology was accessed by phase contrast, Giemsa and H $\ddot{o}$ chst staining, whereas eCBs receptors and enzymes were analyzed by Western Blot. Mitochondrial membrane potential and ROS generation were evaluated by fluorometry. Our results reveal that AEA induced a reduction on granulosa cell viability in a concentration and time-dependent manner. hGC presented less sensibility to AEA than COV434, since it only decreased cell viability over 50 μ M at 24h (vs 10 μ M) and 25 μ M at 48h (vs 5 μ M). This eCB did not induced ROS release nor mitochondrial membrane potential changes. Also, on COV434 AEA induced morphological changes, presenting chromatin condensation at 72h. This study supports the idea that ECS balance is crucial for folliculogenesis and oocyte quality, also indicating that deregulated AEA levels may compromise female fertility.

- **15043 | Local Probing (Ca) $n+1$ (Mn) n (O) $3n+1$ Naturally Layered Perovskite**

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A key issue in materials science is the search for new multifunctional materials due to their potential applications. For this purpose, the high sensitivity of complex oxides to lattice-distortions leads to outstanding physical properties, where the manipulation of these distortions offers new functionalities, e.g. profiting from the magnetoelectric coupling, a most relevant effect in novel energy efficient electronics.

In this work, we find Ca_2MnO_4 , a member of the Ruddlesden Popper series $\text{A}_{n+1}\text{B}_n\text{C}_{3n+1}$ with $n=1$, having a tetragonal $I4/mmm$ structure at high temperatures undergoes a structural transition to a tetragonal $I4_1/cad$ structure at about $\sim 1050\text{K}$, contrarily to previous reports that predict a continuous transition between the two phases at 1500K . Additionally, we were also able to evidence a single structural phase ($I4_1/cad$) from 1000K to 10K , unlike previous electron microscopy diffraction measurements that had proposed the coexistence of $I4_1/cad$ and Aba_2 .

These results were possible to obtain due to the use of a hyperfine method, in this case, perturbed angular correlation (PAC) spectroscopy. Here, the use of a local probe enabled us to follow octahedral tilt and rotation mechanism responsible for the electronic and structural landscapes and coupled phase transitions.

Information on local lattice properties can be extracted by studying the electric field gradient (EFG) tensor. The EFG in the vicinity of the probe atom, which is due to the local charge distribution, allows reconstructing the atomic and electronic environment of the atomic probe in the material. This information can assist in clarifying the origin of the properties exhibited in Ca_2MnO_4 . In particular, as we will show, it experimentally demonstrates that the $I4/mmm$ to $I4_1/cad$ phase transition occurs setting the correspondent transition temperature.

- **15044 | Antibiotic Susceptibility of Marine Planctomycetes and the Effects of Different Salinities on Antibiotic Susceptibility Profiles**

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Antibiotic resistance has recently gained more focus given the increase of multidrug-resistant pathogens, a crisis that represents a threat to human health. In water environments, bacterial species from different sources and different resistance profiles are in close proximity. Through horizontal gene transfer, resistance mechanisms originated in environmental bacteria can be present in pathogenic clinical specimens. Thus, the characterization of the antibiotic susceptibility profile of environmental bacterial isolates is pertinent.

The phylum *Planctomycetes* harbours members described ubiquitously distributed in natural environments. They are known to have large genomes and produce high amounts of secondary metabolites, but hitherto their antibiotic susceptibility profile is still poorly established. Hence, the antibiotic susceptibility profile of six *Planctomycetes* isolated from different macroalgae was addressed. A modified disk diffusion method was conducted, using different saline media. Our results showed that all tested strains were resistant to beta-lactams, aminoglycosides and glycopeptides. All were sensitive to erythromycin, and most were sensitive to other antibiotics that target DNA replication or the protein synthesis, such as chloramphenicol, clindamycin and ciprofloxacin. A yet uncharacterized strain, *Planctomyces* sp. strain FF15, was only susceptible to erythromycin and ciprofloxacin.

Our results were validated by screenings with *Escherichia coli* ATCC 25922 and *Staphylococcus aureus* ATCC 29213. Given the results obtained with these strains on the saline media, it was possible to identify variations in their response against different antibiotics, as a result of the increase in salinity (decrease of susceptibility to aminoglycosides and tetracyclines). This shows the importance of including environmental parameters when testing for antibiotic resistance and searching for new antimicrobial compounds.

- **15045 | Evaluation of oral *Staphylococcus aureus* prevalence in Chronic Kidney Disease patients undergoing peritoneal dialysis**

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Chronic kidney disease (CKD) is an increasing global health issue. End-stage renal disease patients need renal replacement therapies, such as peritoneal dialysis. This condition leads to the build-up of uremic toxins in the body, which can cause suppression of cell-mediated immunity, making patients more prone to infection than other populations. It has been recognized that oral infection may affect the course of many systemic diseases, such as CKD.

Staphylococcus aureus is a human pathogen that can cause a variety of clinical infections and health care-associated infections are becoming increasingly common. Since nasopharynx carriage of *S. aureus* is a known risk factor for peritoneal dialysis-related infections and since the oral cavity is a starting point for the development of systemic disease, this work aimed to evaluate the prevalence of oral *S. aureus* in CKD patients undergoing peritoneal dialysis.

Saliva samples were collected from 40 CKD patients undergoing peritoneal dialysis, with an average age of 56.6 ± 10.5 years. At the time of sampling, these patients were not going through infectious episodes nor undergoing antibiotic therapy. The samples were cultured in Mannitol Salt Agar (MSA), a selective and differential media for *S. aureus*. For this study, yellow colonies on MSA were considered *S. aureus*, although confirmation by molecular biology techniques is ongoing.

Among the 40 patients studied, 72.5% were colonized by *S. aureus* in the oral cavity. Within colonized patients, the colony forming units (cfu) values ranged from 6.7 cfu/mL to 2.4×10^5 cfu/mL, with an average value of $9.2 \times 10^3 \pm 4.5 \times 10^4$ ufc/mL.

Previous studies have shown that oral carriage of *S. aureus* in healthy individuals ranged from 23% to 36%. Thus, the results of the present study suggest that CKD patients undergoing peritoneal dialysis are more prone to *S. aureus* oral colonization than healthy population, being more susceptible to *S. aureus* opportunistic infections.

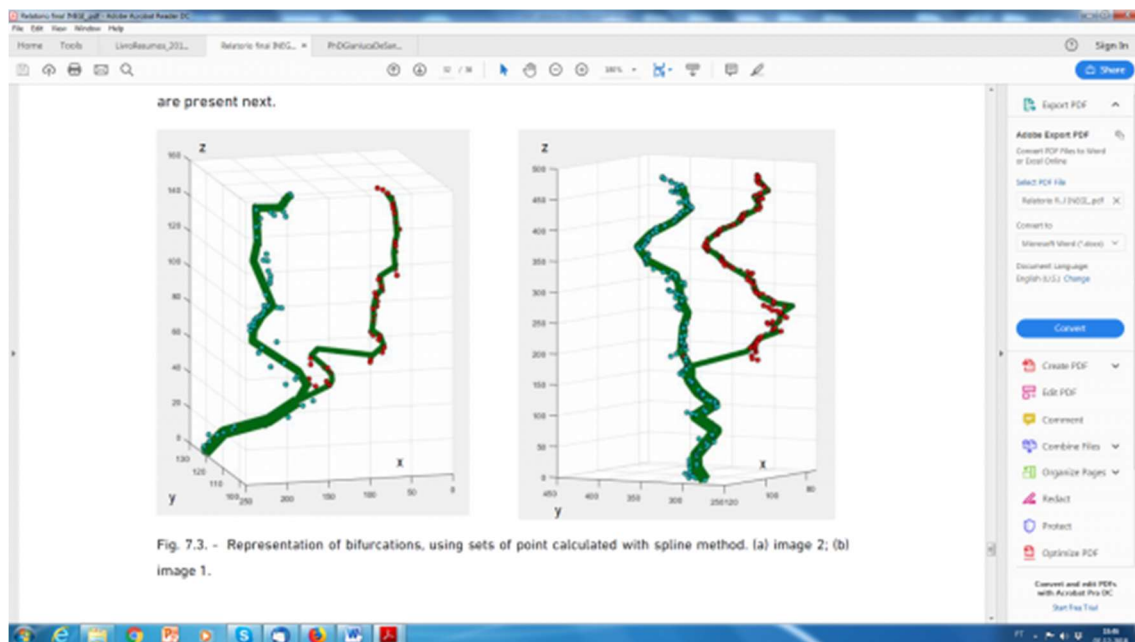
- **15046 | AUTOMATIC RECONSTRUCTION OF THE CAROTID ARTERY BIFURCATION AXIS IN ULTRASOUND IMAGES**

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Developments in vascular imaging make possible to obtain anatomically accurate 3-D images of blood vessels. This work focuses on analysing transverse ultrasound images of the bifurcation of the carotid artery obtained using the so-called freehand 3-D ultrasound methodology. Any method to automatically reconstruct the bifurcation axis from different transverse images requires image segmentation, artery centre identification and alignment. The great complexity of lumen segmentation of transverse images explains the finding the different artery centres along the process. Not only filter application and artefacts existence change the correct positioning of the artery centres, but significant differences of lumen transverse areas are found due to arterial wall movement and cardiac cycle. A proposed weighting process and details of the segmentation process will be referred and explained. Two sets of Doppler images were analysed: one of 160 frames and the other one of 500 frames from two different individuals. Using spline methodology and the set of selected lumens centre locations, the developed algorithm is able to build the bifurcation axis, provides an evaluation performance of the methodology and the possible comparison between results from transversal and longitudinal ultrasound images.

Keywords: Doppler ultrasound, carotid artery bifurcation, B-mode transverse image, bifurcation axis, finding centres process, centres weighting.

Acknowledgments: The author gratefully acknowledges the funding by FCT, Portugal, of the Research Unit of LAETA-INEGI. Special thanks to the Neurology Department of Hospital de S. João, Porto, for providing patient-specific ultrasound images of the carotid arteries.



Obtained carotid artery bifurcation axis for two different individuals

- **15049 | CrossFit elicits alterations in plasma redox markers**

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Introduction and aim: CrossFit (CF) is a demanding fitness program with increasing popularity aiming to optimize physical abilities through a variety of functional exercises involving high intensity contractions-induced muscle hypoxia interspersed by less intense reoxygenation-like periods. This exercise pattern may distinctly favor redox alterations when compared to other types of exercise, such as running, matched for the same intensity. We aimed to analyze the impact of a CF training session and a running period performed at the same duration and average oxygen consumption (VO₂) on plasma markers of antioxidant capacity and oxidative damage. Methods: Ten individuals with at least three months of CF training experience were evaluated. VO₂ and heart rate were monitored during the training session. One week later, the subjects ran on the treadmill at the same duration and VO₂ obtained in the previous CF training session (WOD). Blood samples were collected at rest and immediately after the exercise protocols for lactate, antioxidant capacity (FRAP), total thiols and DNA damage analysis. Results: Compared to treadmill running, CF training induced a significantly higher increase in lactate levels ($p < 0.05$). When compared to resting values, an increase in antioxidant capacity (FRAP, $p < 0.01$), in total thiol levels ($p < 0.05$) and oxidative DNA damage ($p < 0.01$) after a CF training session was observed. When analyzing these markers after the treadmill running protocol, an increase in antioxidant capacity ($p < 0.05$) and an increase in DNA damage ($p < 0.05$) was observed when compared to resting values. In addition, DNA damage was lower after running than after WOD ($p < 0.05$). Conclusion: The results of the present study suggest that, when compared to running, a WOD session differently elicits increased plasma oxidative DNA damage and alterations in redox markers, probably due to the preferential activation of distinct reactive species production pathways.

- 15050 | You are my house: Miragaia and the riverside surroundings. Contributions to the study of built heritage.

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Miragaia, part of the Zona Histórica do Porto - a river town with an industrial and mercantile character - preserves a great part of its urban and geomorphologic primitive shape. Throughout the centuries, this site, connected to the Douro river, was the stage of a developing building activity. If, on the one hand, it received several transformations in the occupation of the buildings, which didn't significantly changed the memory of the slopes, fruit of the anthropic action, and of the valley carved by the river Frio, on the other hand, human intervention changed the organization of the place, with the construction of great dwellings, which gave it a proper landscape. In order to better understand why Miragaia and its riverside surroundings became as we know them today, we have studied the development of the built heritage in a long diachrony. Based on a historical approach, we observed the contexts that led to the expansion of the study-case area, analyzing the evolution of occupation, urban framework, and architectural typologies. For the analysis, iconographical and cartographic sources were crossed with unpublished documentary sources that allowed us to establish relations and causal links. Within a city in constant transformation, construction follows the pace of change. When adapted to the needs of the changing times, a new occupation prolongs the life of any architecture, created to fulfill a function. It seems that there occurred a phenomenon of reconversion of uses of the same spaces, which allowed the conviviality of transformation and permanency in the buildings. This maintenance of the relationship between the built space and the green areas still contributes to the increase of the historical contextual value of Miragaia.

- **15052 | Privacy and Personalization Consumer's drivers, deterrents and moderators to share personal information**

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With the advent of the digital age and the increasing use of Big Data in marketing, potential customers can be easily reached by companies seeking to store and collect their personal data in exchange of highly relevant and personalized targeted offers. However, these individualized marketing activities are often considered intrusive by most consumers, who feel they are losing control over their personal data and their right to privacy.

The study was developed with the aim of filling a research gap, identified as a Marketing Science Institute 2016-2018 research priority, by developing and testing a research model to assess drivers, deterrents and moderators of willingness to disclose personal information. Furthermore, customers' age, gender, past experience and sector of the company as moderators of that same behavior. Data was collected through an online survey that gathered a convenience sample of 956 Portuguese consumers' who have willingly shared personal data online with companies.

Findings showed that proposed drivers such as Perceived Usefulness, Social Influence, Hedonic Motivation and Previous Habits have a positive impact in explaining consumers' willingness to share, with Previous Habits being the most significant of the drivers, while deterrents such as Perceived Internet Privacy Risk and Effort Expectancy were confirmed to have a negative impact in consumers' willingness to disclose personal data. Additionally, data also provided partial or full support to proposed moderators.

The study contributes to a deeper understanding of consumer willingness to disclose personal data, while also aiming to provide support for future research in this area. The study also provides valuable insights for companies interested in obtaining consumers' consent to use their personal data during online interactions, across target segments and industries.

- **15055 | Rotten Apples do not fall on heads! Or do they? A gravity-inspired empirical assessment of the effect of corruption on migration**

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This research aims at studying the effects of corruption on international migration through a gravity model. By using information that covers migration inflows into 20 Organisation for Economic Co-operation and Development (OECD) countries from the Institute for Employment Research (IAB) dataset, we examine if corruption is a push and/or pull factor for migrants and if this impact varies by skill level and gender. First, we use the data for 2010 with a Poisson regression and then we consider the full period (1980-2010) with a corresponding fixed effects model. We find that, in accordance with previous literature, corruption is a significant push and also a significant pull factor for overall migration. The novelty of this finding is that this result is significant in our panel gravity model, using not only cross-sectional data but also time-series. Our results also show that unlike what the literature predicts, high skilled individuals may not be the most likely to migrate, but rather seem to be the less likely group to be affected by corruption. Adding to that, we find that the effect of corruption on low skilled migrants may be lessened by their inability to migrate. Another finding that is important to highlight is that corruption at the origin country affects different skilled individuals in a different way than corruption at destination. Finally, we find significant gender differences in the effect of corruption. However, if we simply compare overall female and male migration these differences are not significant. In fact, these gender differences remain hidden unless we add the extra skill level layer of analysis. Our results seem to reflect an extra incentive in origin countries to target the female population segment. Furthermore, this discrimination through corruption appears to be less significant in destination countries.

- **15056 | Effects of a multicomponent exercise training program on balance of severe obese patients following bariatric surgery - BaSEIB Clinical Trail**

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Introduction: Physical exercise have already shown to promote health benefits after bariatric surgery (BS). However, there are no evidences that exercise improves balance following surgery. Our aim was to determine if a training program can promote balance benefits after BS. Methodology: One month after BS, 23 obese women (47.2 ± 9.4 years; 40.7 ± 3.7 Kg.m⁻²) were randomized to either an exercise group (EG, n=13) or a control group (CG, n=10). EG patients underwent a supervised exercise training program (3x/week; 75 min/session) that included multidirectional jumps, balance and strength exercises for 5 months. CG patients received only standard medical care. Balance in quiet upright bipedal stance, evaluated with a force platform, was assessed in eyes open (EO) and eyes closed (EC) condition in both groups at 1 and 6 months after surgery. Balance parameters analyzed were ellipse, mean velocity of center of pressure (CP) in antero-posterior (AP) and medio-lateral (ML) directions, standard deviation of CP displacement in AP and ML direction and mean total velocity of CP. To determine the effect of exercise training on balance (interaction group $\times$ time), a repeated measures ANOVA was used. Results: No differences were observed in balance parameters between the two groups at baseline. The within-group time effect analysis showed no significant changes in the CG in all balance parameters analyzed between 1st and 6th month after surgery. In the EG, there was a significant decrease in ellipse with EO ($p=0.017$) and a non-significant trend for a decrease in AP standard deviation with EO ($p=0.054$), while the remaining parameters remained unchanged. Furthermore, the group $\times$ time interaction results showed that only ellipse with EO was significantly different between the CG and EG ($p=0.035$). Conclusion: A five-month supervised exercise training program improved balance in women who underwent BS.

Keywords: weight loss surgery; postural control; force platform; physical exercise.

- **15058 | Stress and weight in Portuguese: married or divorced?**

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Preliminary remarks. The importance of weight in the attribution of lexical stress in Portuguese has been widely discussed by many Portuguese phonologists and morphologists. The majority (Pereira 1999; Roca 1999; Mateus e D'Andrade 2000; Mateus et al. 2003) supports the idea that the stress in Portuguese depends only on morphological factors. However, others (Brandão de Carvalho 1988; 1989; 2011; Wetzels 2007; Veloso 2017) say that there is phonological strong evidence for the interference of weight.

The phenomena. Another clue attesting the importance of weight would be the diphthongation of non-low vowels and the change in the quality of the low vowel /a/ in stress positions in some dialects of Portuguese, as in the northern dialects (Rodrigues 2002) and in some insular dialects (Silva 1994; Segura da Cruz e Saramago 1999).

Descriptive hypothesis. On the one hand, we can just say that this phenomenon is post-lexical (Brissos e Rodrigues 2016) and, therefore, eliminating any phonological conclusions from it. However, on the other hand, noting that there are many different results for diphthongation, we can put the hypothesis of a subjacent structure of length, not only inherent to the vowel (Pochtrager 2006) as in the case of /a/, but even in the syllable, especially if the peak is fulfilled but a non-low vowel, making them always heavy in a deeper level.

Conclusion remarks Using simultaneously a lexical (Kiparsky, 1982; Mohanan, 1986) and an element approach (Schane 1984; Brandão de Carvalho 1993; Boltanski 1999; Angoujard 2003; Backley 2011), we can propose that in a deep structure level, the stressed syllable has some sort of empty position, once every stressed vowel in Portuguese can be potentially diphthongated or change its quality. This proposal corroborates the minimality condition for Portuguese, established by Veloso (2017): the bimoracity.

- **15059 | Motivational Regulations and Basic Psychological Needs Satisfaction in Crossfit**

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Motivational regulation and basic psychological needs satisfaction were analysed in crossfit enthusiasts. 85 participants (Mean of age=32,85±7,06) were submitted to a questionnaire to assess their motivational regulation (BREQ-2) and to evaluate their basic psychological needs satisfaction (NPBES). Three items of open answer were also included, to identify the motives to start the practice of crossfit, the maintenance of the practice and what differentiates Crossfit from other forms of physical exercise. Results revealed a high satisfaction of all basic psychological needs, with relatedness showing slightly higher values of satisfaction (Autonomy (4,20±0,68), Competence (4,20±0,58), Relatedness (4,51±0,49)). Results also revealed a more autonomous regulation Amotivation (1,03±0,12); External Regulation (1,16±0,31); Introjected Regulation (2,85±0,86); Identified Regulation (4,68±0,53); Intrinsic Motivation (4,61±0,51).. Basic psychological needs satisfaction is associated to more autonomous and self-determined regulations. Correlations between basic psychological needs and motivational regulation showed that all basic psychological needs were positively correlated with autonomous motivation, but competence perception appeared to be the basic psychological need that had higher correlation values and the only one showing statistically significant differences. Relatedness was the basic psychological need that presented higher negative correlation with controlled motivation. This study also revealed that people choose crossfit thanks to its variety, although, feeling competence was also mentioned to be a factor to choose crossfit. What was mentioned to be the factor responsible for the maintenance, results show the competence and joy when practicing crossfit. What revealed being the factor to differentiate crossfit from the rest was once again variety.

Keywords: CROSSFIT, MOTIVATION, SELF-DETERMINATION THEORY, BASIC PSYCHOLOGICAL NEEDS

- **15062 | Composition of the essential oils isolated from two *Zanthoxylum* species used in traditional medicine in Guinea-Bissau**

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Leaves, stems and roots of *Zanthoxylum leprieurii* Guill. & Perr. and *Z. zanthoxyloides* (Lam.) Zepern. & Timler (Rutaceae) are used in Guinea-Bissau's traditional medicine, in order to treat various health conditions and adverse effects.

This project aimed to extract and analyze the essential oil composition of the aerial parts of two species of this genus, in order to identify the chemical compounds, present in both species, for future biological activity assays.

The samples were collected at the João Vieira Poilão National Marine Guinea-Bissau, in October 2016, being dried in the shade.

The essential oils were extracted by hydrodistillation and analyzed by Gas Chromatography and Gas Chromatography associated with Mass Spectrometry.

The yield of the essential oils of *Z. leprieurii* and *Z. zanthoxyloides* was 0.39% (v / dw) and 0.05%, respectively. α -pinene (43%) and 1,8-cineole (15%) were the major compounds in the essential oil of *Z. leprieurii*, while in *Z. zanthoxyloides*, β -caryophyllene oxide (21%) and α -pinene (19%) were the majority.

Previous studies have shown similar yields on extracted essential oils of the leaves of *Z. leprieurii*, but with different main components, indicating further studies of these species are necessary to confirm the chemical variability and biological properties thereof.

- **15063 | Portugal in the Castilian and Aragonese chronistic: from Pero López de Ayala to Jerónimo Zurita**

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In the globalized world, as it is ours, the study of relations between peoples acquires particular relevance, and the analysis of the discourses that others produce about us may prove to be a contribution to the perception of our own identity and our place in the world.

Those are the discourses that constitute the object of the research work presented, namely those produced by the Castilian and Aragonese chronistic about Portugal, more specifically in the "Chronicle of the King Don Juan", by Pero López de Ayala, and in the "Annals of the Crown of Aragon", from Jerónimo Zurita, in a comparative perspective, to which Portuguese historiography seems to have not yet given due relevance.

Starting from the reading of the mentioned sources, we analyzed the discourses produced on Portugal, the Portuguese territory, the Portuguese and the relations of this kingdom with its European congeners.

The result was the finding of a clear and sharp difference between the Castilian and Aragonese discourses of those two chroniclers, which we detail in the course of the study. Taking into account the different perspectives conveyed by the those chronicles, we developed yet a proposal of interpretation regarding the positioning of Portugal in the medieval Iberian chess, the "Game of the Kings". This is an investigation carried out within the framework of the Seminary of Medieval History, but which reveals a vast potential for future deepening.

Keywords: Iberian Medieval Chronicles; Portugal, Castile and Aragon; Pero López de Ayala; Jerónimo Zurita.

- [15064 | Mental illness, schizophrenia and economic growth: a panel analysis of 157 countries, 1990-2016](#)

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Considered by some as the greatest challenge on health of the 21st century, mental disorders affect between 15% and 20% of the world population. Although the existence of high burden on mental illness and schizophrenia is consensual, existing literature has focused its analysis on methodologies of mental illness costs estimation, not relating them with countries' economic growth.

Resorting to fixed effects panel data estimations, and data from 157 countries, covering the period from 1990 to 2016, it is evaluated if, and to what extent, the prevalence and incidence of mental illness, in general, and schizophrenia, in particular, affect countries' economic growth.

Estimation results reveal that prevalence and incidence of mental illness and schizophrenia adversely significantly affect the growth of economies. This negative impact is aggravated in contexts characterized by high total and graduate unemployment rates and high proportion of young people who are Not in Education, Employment or Training (NEET). It is also found that these negative indirect effects are more pronounced in the case of schizophrenia.

- **15067 | Public sport policy: Focus on the social centers for family and elderly in the state of Amazonas (Brazil)**

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The constitutionalisation of sport in the 1988 Constitution brought new hopes and individual and collective realities to the Brazilian people. Being considered for the first time in the history of the country as a fundamental social right, it became the duty of the State to promote formal and non-formal sports practices as a right of every citizen, that is, the State must guarantee to all Brazilians the sports dimensions represented by educational sport, performance sport and sport for all. Since then, the State's involvement in the development of sport has been a valuable object of public policy analysis. In the State of Amazonas, there are few academic productions on this subject, which led us to examine what the State Government has done in the scope of public sports policies. This study investigated the "Social Centers for Family and Elderly", a project developed by the Sports Department of the Amazonas State Government, and aimed to: (i) identify the Social Centers as a sport promotion factor in Amazonas; (ii) contextualize the Social Centers within the scope of the State's public sports policies; (iii) characterize the Social Centers; (iv) analyze the performance indicators of this project. This was a documentary research, exploratory and descriptive, with a qualitative approach. The documents analyzed were made available by the Government of Amazonas. The main conclusions evidence that the Project: (i) is part of the Amazonas sports policies in the dimension of sport for all; (ii) contributes to sports development insofar as it provides sports facilities and diversified sports in six Social Centers; (iii) makes it possible for children, adults, the elderly and people with disabilities to exercise the constitutional right to sport; (iv) promotes social integration and inclusion through sport, especially those in situations of social vulnerability.

Keywords: PUBLIC SPORT POLICY. PROJECT MANAGEMENT. SOCIAL CENTERS FOR FAMILY AND ELDERLY. SPORT FOR ALL.

- **15068 | Analysis of the religiosity effects on criminal behavior**

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This investigation aimed to analyse the relationship between religiosity and criminal behavior. Specifically, we sought to explore the direction and extent of this relationship, understand if religiosity operates as a significant distinctive factor between individuals who comply and those who revoke parole, as well as analyze how religiosity relates to and interacts with other variables, namely the main predictors of crime (criminal attitudes, personality, self-control, moral beliefs and criminal history) in determining criminal behavior. A questionnaire was carried out on a sample of 200 individuals from the northern area of the DGRSP (100 inmates whose probation was revoked for committing new crimes and 100 on parole at least six months).

The findings of this study show that religiosity had a small but significant effect on the self-reported criminal behavior in terms of the committed crime number. However, this effect has lost its importance when other variables are included in criminal behavior explanation models, revealing as more significant criminal history, criminal attitudes and personality. Criminal attitudes and self-control have mediated the relationship between religiosity and crime, which means that, through these factors, religiosity may still have an effect on criminal behavior. In this study, the antisceticism hypothesis was not confirmed, and thus, there were no significant differences of religiosity in the type of perpetrated offences. Religiosity also did not allow to differentiate the fulfillment of the parole, being criminal history, criminal attitudes and personality (neuroticism and openness to the experience) the decisive factors of parole success. The results are discussed and analyzed underpinning the empirical evidence produced within the framework of the relationship between religiosity and crime. Some criticisms and limitations to the research are also raised and future research clues are suggested.

- **15071 | The Woodland Crematorium: a peak into Gunnar Asplund's design process**

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The Woodland Crematorium, located in the Woodland Cemetery, in Stockholm, represents the last great work of the architect Gunnar Asplund. In 1935 Asplund was asked by the Stockholm Cemetery Commission to design a crematorium in the cemetery designed by himself and Sigurd Lewerentz, in 1915. This new building was intended to serve funerary ceremonies from three chapels - a main one and two smaller ones, - and a crematorium, connected to each of the chapels.

Anchored to the place and the landscape, the ensemble, developed along a route, ends with a portico that precedes the entrance to the great chapel. This condition reminds us of the placement of a temple on the monumental landscape, and the harmonious relationship between nature and architecture, experienced by Asplund on the trip to Italy in 1913. Inside, the main geometric lines balanced with the work of light contribute to create an atmosphere of peace and serenity. Considering the atmosphere of the cemetery as a place of worship and silence, the crematorium's architecture tries to respond to the pain and feelings of loss caused by death, not only by the relationship with the landscape, but also by the work of the form, balancing a particular architectural expression - language.

This paper intends to understand and portray the significance of the crematorium's work phases, by analysing Asplund's personal archive, in order to interpret how the different design themes were underlined and decisive for an unique reading of the whole ensemble.

This study is part of an ongoing master thesis on Master's Degree in Architecture, at FAUP, 2018/19, under the supervision of Helder Casal Ribeiro. It is our objective to emphasise the importance of this project for the understanding of modern architecture.

- **15073 | The Royalty and the Male Monastic Orders. Reign of King João I.**

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After D. Fernando's death, in 1383, Portugal entered on a period of great political and social convulsions. After two years without a King, D. João, Mestre de Avis, son of D. Pedro I and Teresa Lourenço became King of Portugal in Coimbra's courts.

Having gained the throne not by the most orthodox way, seems important to understand how the new King related with his people, his new subjects; being a bastard son of a former King, he had, without doubt, a difficult task to affirm himself as Lord of the kingdom Lords.

His popular support is well known and have been studied by a lot of historians, as have his fame of "friend of his friends"; his reign was strongly marked by the fall of several important portuguese nobiliarchic families and the rise of others, until then not so important on the political, social, economical and administrative life of the Kingdom.

Using the "Chancelaria Régia" books, correspondent to the reign of D. João I, the correspondence sent to the various portuguese male monastic orders was analyzed in order to understand the relationship of the king with this orders, who played an important role among the social and cultural life of the kingdom and the people, being, in some way, thought modelers of this group. In this documents were found donations of properties and privileges, letters of protection, consent of elections, confirmation of privileges and others, in different chronological periods, with various claimants in seven distinct dioceses and to eight different monastic orders.

With this material, it was intended to understand if the king gave a lot of privileges to this social group, or if he removed some; if he had a "preferred" order, monastery or diocese; which type of documents were more common and in which period, understanding, in this way, the position adopted by the new king in the course of his reign to this important social group.

- **15075 | Additive Manufacturing: a biomedical overview**

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This work aims to present a transversal review on 3D printing on biomedical and bioengineering applications, its evolution and most recent developments. 3D printing is the term that is commonly used to describe additive manufacturing (AM) processes. Using 3D virtual models, AM allows the development of physical prototypes through layer-by-layer material deposition by means of various physical and chemical processes (Gibson, Rosen et al. 2015). Along with technological development, AM technology has grown to several application areas. Since AM permits to manufacture inexpensive materials with freedom of form, it enables the creation of structurally optimized prosthesis, reducing the amount of material and the total weight of prosthesis (Huo, Dérand et al. 2015). The most common 3D printing technique is the Fused Deposition Modeling (FDM) technology, which was developed in the 80's. Therefore, in this work, it was performed a survey focused in FDM studies between 1986 and 2018. The following scientific databases were used to find and select the studies: SCOPUS, PUBMED and MIT Libraries. FDM implies that the material used, in this case thermoplastic, is extruded by a nozzle (Gibson, Rosen et al. 2015). To date, this technique has evolved, along with the equipment and software involved, with broad applications in the field of biomedical engineering, such as the development of customized high-performance implants and multifunctional biological materials (Huo, Dérand et al. 2015). The output of our work shows that the interest in such topic is increasing exponentially. In SCOPUS database, using the keyword "Fused Deposition Modeling" it were found 3007 FDM articles since 1986. In the first 4 years, only 3 articles on this area were printed and in the last 3 years 1811 articles were published. To conclude, in the end, this work provides current trends and future applications for this innovative technology in the field of bioengineering.

- **15077 | Living in Shenzhen: a path through A+E Design office**

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The purpose of this paper is to reflect on a different cultural heritage and work process set through an internship experience in Shenzhen, China, at the A+E Design office, which provided a privileged contact with a new architectonic culture at a very high professional level. During the six months of internship, several projects were developed, allowing the confrontation with new enriching realities, complemented by an enhanced daily routine.

The office A+E Design, located in the heart of Shenzhen, stands out by depicting the city's fast track understanding of urban culture and financial boldness through its large-scale works and its technological aspect. The office seeks to understand the contemporary way of living in the southwest of China. The internship took place in the Overseas Design Studio department (ODS), with the specific objective of developing projects in the initial phase of its design, which was comprised mainly by exploration of the concept and deepening of the architectural form. The experience of working in this office enabled to approach the reality of the country and the demands of the city, through the design methodologies practiced by the ODS department.

The paper results, reflects and consolidates the intense months of work in the A+E Design office by presenting a personal exploration that seeks to understand the way of thinking and executing architecture in the A+E Design office interwoven with Shenzhen's accelerated reality and daily life. Consequently, an in-depth interpretation of A+E Design's design characteristics, methods and procedures is presented, setting a specific socio-cultural understanding, in order to grasp the architecture practiced in southwest China.

This study was part of a master thesis in Architecture, at FAUP, 2017/18, under the supervision of Helder Casal Ribeiro.

- **15079 | Switched Reluctance Motor: A New Alternative for Electric Vehicles**

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Switched reluctance motors (SRM) are a suitable and cheaper alternative for current electric vehicle (EV) powertrain topologies due to low weight, high torque/size ratio and simple construction, without permanent magnets and a minimum amount of copper. The main setback that these motors encounter is the high torque ripple, mainly due to the highly nonlinear torque generation mechanism. Torque ripple leads to mechanical vibrations that require unnecessary wear in the mechanical powertrain.

In conventional torque sharing function (TSF) control, the torque produced by the machine cannot follow the expected torque for an extended speed range, mostly due to the imposed demagnetization of the outgoing phase at high speeds, resulting in poor performance and causing a high torque ripple.

The main goal of this ongoing work is to design and validate a new SRM control method suitable for EV propulsion. The proposed controller applies a feedback loop that improves the weakness of the conventional methods, keeping a fast dynamic response. The simulation results show that torque ripple can effectively be reduced for a high torque and speed range. The researched algorithm is developed using Matlab/Simulink, basing the validation on experiments with a 60kW SRM, 12/8 poles prototype designed using finite element methods (FEM).

- **15082 | Black Soldier Fly *Hermetia illucens* meal as fish meal substitute in diets for meagre *Argyrosomus regius***

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In aquaculture, finding alternative ingredients to fish meal (FM) is urgently needed. Insect meal (IM) is an innovative source of nutrients to be included in aquafeeds. Insects are rich in protein, amino acids and lipids, and leave a small ecological footprint, thus representing a good alternative to FM. Within the EU, authorization to use IM in aquafeeds is very recent (June 2017).

Meagre *Argyrosomus regius* presents a very good potential for large scale farming in Mediterranean countries due to its high growth rates, market characteristics and nutritional value, being an attractive candidate for Mediterranean aquaculture species diversification. This study aimed to provide a cost-effective formulation for meagre diets using a novel commodity (IM), with high potential for FM replacement.

Four experimental diets were formulated to be isoproteic and isolipidic. A FM-based diet was used as a control (CTR diet), 3 other diets included 10%, 20% and 30% of black soldier fly *Hermetia illucens* larvae meal (HM) (diets HM10, HM20 and HM30, respectively). Fish were fed to apparent visual satiety during 9 weeks. Dietary inclusion of HM up to 20% had no effect on meagre growth performance. In contrast, lower growth and N retention (g/kg average body weight/ day) were recorded in fish fed diet HM30 compared to the control. Feed intake, feed efficiency, protein efficiency ratio and whole-body composition were unaffected by diet composition. With the exception of apparent digestibility coefficient (ADC) of protein, which was lower in fish fed HM diets compared to the CTR diet, ADC of dry matter and lipids remained unchanged. Trypsin activity was lower in HM30 diet compared to CTR diet. In conclusion, up to 20% of HM may replace 35% FM in diets for meagre, without compromising growth and feed utilization.

Acknowledgments: This study was funded by IJUP/SOJA DE PORTUGAL (PP-IJUP2017-SOJA DE PORTUGAL-33) and by Fundação Amadeu Dias, with a grant included in the Project.

- **15083 | GAPDH maternal vaccination affects brain's myeloid cells of their offspring**

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Group B Streptococcus (GBS) colonizes the gastrointestinal and vaginal tracts of healthy women and causes neonatal diseases. Our group developed a vaccine using the GBS glyceraldehyde 3-phosphate dehydrogenase (GAPDH). However, we observed that maternal vaccination interferes with the gut colonization of their offspring. Research over the past few years reveals a cross-talk between the gut microbiome and central nervous system. Here, we evaluated the effect of GAPDH maternal vaccination on brain development of their offspring. Female BALB/c mice were immunized with recombinant GAPDH, or not (control), before pregnancy, and the progeny were evaluated for neurodevelopmental milestones, during the first 21 days of life. Pups born from vaccinated mothers presented decreased weight gain from postnatal day (PND) 4 to 8, recovering thereafter. Regarding the reflexes and coordination movements, no differences were observed between the groups. Astrocytes and immature neurons were evaluated at PND 8 by immunohistochemistry. A slight increase in the hippocampal astrocytes was observed in the group of pups born from vaccinated mother. No difference was observed in the immature neurons between the groups. The brain myeloid cells composition was assessed by flow cytometry at PND 8. Although the percentage of microglia and granulocytes were not different between the groups, in pups born from vaccinated progenitors the microglia presented an activated state, and the frequency of monocytes/macrophages infiltrates was significantly higher than those observed in pups born from control mothers. Moreover, a decrease in inflammatory monocytes population (important for brain homeostasis) was observed in the brain of pups born from vaccinated mothers. All these results indicate that GAPDH maternal vaccination interferes with the immune cells present in brain. More experiments will be done to elucidate whether these alterations contribute to a neurological pathology in later life.

- **15084 | Binding lipophilicity with passive permeation of drugs: analysis of different BCS classes**

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Lipophilicity plays a fundamental role on drug pharmacokinetics and pharmacodynamics (1). Usually, it is expressed as a partition coefficient (Log P) in the classic octanol/water system. This method is simplistic since it only considers the non-polar interactions (1,2). Lipophilicity can also be expressed (Log K_p) using biomimetic models, such as liposomes, which mimic the cellular membranes. In fact, these models take into consideration both polar and non-polar interactions that occur in the biological environment, which allow to express the lipophilicity of drugs with greater reliability (2,3).

Membrane permeability is also essential in predicting drug absorption. In this work, we present and discuss for several drugs from different therapeutic classes the partition coefficients obtained from biomimetic models (Log K_p) determined by derivative UV-Vis spectrophotometry and using liposomes prepared with two different lipids (POPC and DMPC). These results allowed us to establish some considerations about the advantages of liposomes when compared with Log P values and which lipid mimics better the partition that occurs in vivo.

Models that embrace the permeability-lipophilicity relationships are important for drug discovery (4). So, in this work Log P and Log K_p values of the studied drugs were also related with their passive permeation (Log P_m pH 7.4).

Acknowledgements: This research was partially supported by the Strategic Funding UID/Multi/04423/2013 through national funds provided by FCT, ERDF, in the framework of the programme PT2020 and the project PTDC/MAR-BIO/4694/2014 (reference POCI-01-0145-FEDER-016790; 3599-PPCDT) in the framework of the programme PT2020.

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- 15090 | Form and function of reformulation markers in scientific popularization text

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This paper intends, on the one hand, to make a general analysis of the semantic values of the different reformulation markers (RM), describing their functions as discursive markers, and, on the other hand, to make a quantitative analysis of them in the texts that compose the corpus. In addition, popularization texts have been chosen because, with respect to their most relevant linguistic-discursive traits, Ramos & Marques (2016: 98) affirm that the markers of reformulation are the most prominent markers in the construction of textual reference, in this textual genre. For this purpose, it was analysed 22 popularization texts that were extracted from three different Internet sources: *Ciência Viva*, *Ciência com Todos* and *Público*. It was considered the studies that emanate from Cuenca (2003), Cuenca & Bach (2007), Lopes (2014), Lopes & Carapinha (2013; 2017), Ramos & Marques (2016) and Vercruysse (2009) because they make an important contribution to the description of the RM in semantic-functional terms.

The analysis of the empirical data allows to draw the following conclusions: 1. We found a 0.25% use of RM, something that was expected since it is a type of markers, but also because of the textual genre; 2. The RM that the speakers of the texts used more are "isto é" (34.62% occurrences), "ou seja" (21.15% occurrences) and "afinal" (9.62% occurrences); 3. It has been found that broadcasters prefer to use fixed and simple forms to carry out the reformulation process, representing 82.7% of the total percentage of the RM used; 4. "Isto é" has a cataphoric function and an explanatory value, and can appear in equative contexts; 5. "Ou seja" has a cataphoric function and an explanatory value. It occurs in metalinguistic and equative contexts and presents cases of self-reformulation; 6. "Afinal" carries simultaneously a value of reformulation and a semantic value of not definitive end, confirming the affirmations of Fernandes (2005).

- 15094 | Effects of simulated harvesting on seaweeds target species and rocky shore assemblages in northern Portugal

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Seaweeds are multicellular photosynthetic organisms, typical of aquatic environments, of great ecological and economic importance, used in the food and pharmaceutical industries. The growing interest in this resource emphasises the need to regulate its harvesting and to accomplish such management it is mandatory to evaluate the effect of harvesting on seaweed recovery rates.

This study intends to analyse the influence of two harvesting methods on the biomass recovery of seaweed with potential economic interest: cutting 2/3 of the fronds; and plucking. The selected target species are *Osmundea pinnatifida* and *Codium* spp., species with promising applications, e.g. as food or source of bioactive compounds.

The experiments started during summer 2018 and will run for 12 months in two shores for each species. On each shore a block design was implemented with three fixed plot treatments (0.25 m²) per block: control; cutting; and plucking. At the beginning of the experiment, after each experimental treatment, percentage cover was recorded in order to estimate the remaining biomass.

The percentage cover of target and non-target species has been followed monthly and for target species, percentage cover data is converted to dry biomass using regressions available for those variables. This will allow estimations of indicators such as harvesting rate at the beginning of the experiment and biomass recovery throughout the experiment.

Analysis of variance will be used to investigate if those indicators and biomass, vary with shore and harvesting method. The influence of the harvesting methods on seaweed and *Sabellaria alveolata* assemblages will be assessed by multivariate analysis of percentage cover data in order to investigate possible convergence or divergence patterns.

The results gathered until February 2019 will be presented, reflecting the dynamics of target and non-target species in response to harvesting since the previous summer.

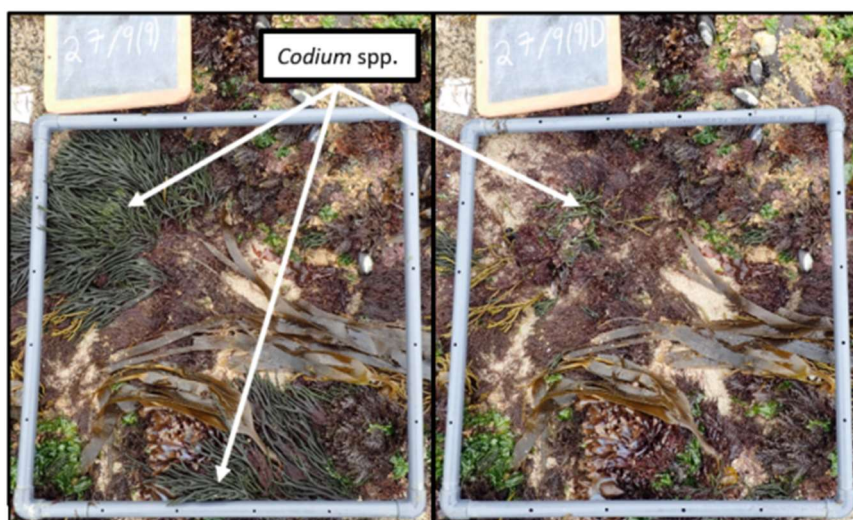


Figure 1. *Codium* spp. experiment fixed plot, before (left) and after (right) plucking.

➤ Plot 27/9(9), 3rd Block, July 2018, Aguçadoura

Example of experiment fixed plot

- **15095 | Development of novel photosensitizers for Photodynamic Therapy of Cancer**

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Photodynamic therapy (PDT) is a minimally-invasive approach for cancer treatment, this requires only a non-toxic photosensitizer (PS), presence of $3O_2$ and light. Namely, light irradiates the target site and photoexcites the PS. Upon in a singlet excited state, the PS crosses to relatively long-lived triplet states and induces the generation of reactive oxygen species (ROS), by energy transfer to $3O_2$. As only tissue containing the PS and irradiated by light undergoes PDT, this is considered a selective therapy with limited side-effects, thereby possessing potential for superseding conventional therapies (such as chemo- and radiotherapy). However, due to problems regarding the depth of light penetration into biologic tissue, PDT can only be used on tumors located on the lining of internal organs/cavities and under the skin [1].

Herein, we have developed new PSs for PDT that can be self-activated inside tumor cells without the need for an external light source. More specifically, these PSs are capable of self-activation in the absence of light by undergoing a chemiluminescent reaction. Furthermore, they are chemiexcited directly into a triplet state, which allows them to interact with $3O_2$ to generate ROS, without previous energy transfer steps [2]. Proof-of-concept was provided by fluorescence monitoring of ROS-probes and in vitro toxicity assays. This opens the door for using PDT for treating tumors irrespective of their size and localization in the body.

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- **15098 | Influence of environmental challenges on the oxidative status of *Pelvetia canaliculata***

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Nowadays, there have been ongoing discussions about the global warming and how the environmental changes affect the survival of living beings. Due to their sessile nature, macroalgae are particularly susceptible to variations in environmental factors (salinity, UV radiation and temperature), hence the increasing interest in using them as research models. Although reactive oxygen species are produced during the normal cellular metabolism, environmental constraints can trigger their accumulation, inducing oxidative damage. Therefore, the main objective of this study was to explore the influence of seasons and tide cycle on the physiology of *Pelvetia canaliculata*. For this purpose, three sampling dates (two in Summer and one in Spring) were done in intertidal rockshores, both during high and low tide. After processing the samples, the content of photosynthetic pigments and the degree of oxidative stress was measured by lipid peroxidation (LP), hydrogen peroxide (H₂O₂), proline and thiols were studied. Results revealed that, under low tidal conditions, the total chlorophyll levels were noticeably higher, with carotenoids also showing the same trend. Moreover, despite not being a reliable indicator in relation to different tides, H₂O₂ content appeared to oscillate seasonally, with the highest values being recorded in summer. Concerning LP, proline and thiols, no significant effects of tide were found; however, a tendency for increased levels of LP and thiols under low tide was noticed, possibly indicating changes in the redox homeostasis. Overall, it can be concluded that *P. canaliculata* modulates its physiology in response to both tide regimes and seasons and, thus, special attention must be driven to these issues when studying this macroalgae's response to climate challenges.

Acknowledgments: This work was developed under the Project No. 029818, co-financed by COMPETE 2020, Portugal 2020 and the EU through the ERDF, and by FCT through national funds.

- **15099 | Adding protein to a carbohydrate beverage ingested before exercise does not alter oxygen consumption and blood metabolic parameters - A randomized double-blind study in middle-distance runners**

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The current study aimed to assess the effect of pre-exercise intake of carbohydrate plus protein - CHO+PRO (0.75+0.25g/kg BW) vs. CHO alone (1.0g/kg BW) on oxygen consumption related variables, blood metabolic biomarkers and performance during a stepwise running exercise comprising different intensities until exhaustion. Ten middle distance runners (24.6±4.7 yrs and 60.9±7.2 kg) were tested in three moments (always after at least 10 h of fasting) with two days of interval in a randomized and double-blind manner (CHO, CHO+PRO and placebo - PLA). They ingested the beverage (CHO+PRO, CHO or PLA) 30 min before start testing, which consisted of 4 min progressive running steps with 1 min rest between each exercise load. Venous blood samples were collected four times (fasting, 30 min after beverage ingestion and after the 3th and 7th steps) and capillary blood were obtained at rest and at the end of each step for blood lactate concentration ([La-]) analysis. The addition of PRO had no influence in the analysed physiological parameters (maximum oxygen uptake, anaerobic threshold, respiratory exchange ratio, heart rate), [La-], gastrointestinal discomfort and rate of perceived exertion. Time until exhaustion was not different between conditions PLA, CHO and CHO+PRO (1895±120, 1865±100 and 1860±119 s, respectively). The analysed blood metabolic biomarkers (glucose, insulin, FFAs and glucagon) were not different between the studied conditions. The addition of PRO induced a tendency for decreased glycaemia and increased insulinemia when compared with CHO only. In conclusion, the addition of PRO to a smaller amount of CHO, ingested 30 min before the described exercise, had no impact on running performance, oxygen consumption related parameters and blood metabolic biomarkers when compared to the ingestion of CHO only.

- **15100 | Lattice dynamics of piezoelectric (K_{0.5}Na_{0.5})NbO₃ (KNN) prepared by different sintering methods**

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The substitution of lead-based materials is important to assure sustainability. Though lead-based materials have higher piezoelectric values, there are other promising friendly environment compounds, namely K_xNa_(1-x)NbO₃. For x=0.5 (0.5KNN), the high-temperature cubic symmetry changes to tetragonal at T₃=693 K, becoming ferro- and piezoelectric. At T₂=491 K it becomes orthorhombic, stabilizing in rhombohedral below T₁=165 K. Recently, theoretical calculations predict piezoelectric enhancement when T₃ and T₂ become closer. The sintering conditions and microstructure have revealed important to improve its ferro- and piezoelectric properties. To understand the effect of sintering conditions on piezoelectricity in 0.5KNN, ceramics have been prepared through different sintering methods: conventional sintering (CS), spark plasma sintering (SPS) and spark plasma texturing (SPT). XRD data at room conditions reveal that the two latter processes yield 0.08 and 0.16 GPa of internal stresses. This has strong repercussions on the values of the piezoelectric coefficient d₃₃, increasing from 50 for SPS to 125 pC.N⁻¹ for SPT samples. Raman spectroscopy is a powerful tool to study structure and distortions in materials, which may be important to disentangle the basic structural features underlying the piezoelectric enhancement on 0.5KNN.

In this work, we present a lattice dynamic study of 0.5KNN ceramics produced by three different methods as a function of temperature using Raman spectroscopy. Depending on the sintering method, we have observed clear critical temperature shifts, and specific different modes behaviors at T₁, T₂ and T₃. The value of the piezoelectric coefficient is apparently associated with the relative shifts of the critical temperatures and we assume that to reach the best compromise is using the SPT sintering method.

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- **15102 | GAPDH maternal vaccination causes mortality in a mouse model that reflects the human Group B Streptococcus disease**

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Group B Streptococcus (GBS) is the leading causative agent of neonatal diseases. Since this bacterium is vertically transmitted, maternal vaccination is the better option for prevention of neonatal GBS infection. Our group developed a vaccine based on glyceraldehyde 3-phosphate dehydrogenase (GAPDH) of GBS as an alternative to the use of intrapartum antibiotics. The aim of this study was to confirm the effectiveness of GAPDH maternal vaccination, tested in offspring infected i.p. after birth, in ones that acquire the bacterium from vaginally colonized mothers. Female BALB/c mice were actively immunized with recombinant GAPDH, or not (control), mated and inoculated intravaginally with a hypervirulent strain of GBS during pregnancy. Vaccinated mothers are highly colonized in their vaginal mucosa despite presenting high serum levels of anti-rGAPDH IgG antibodies. Unexpectedly, the pups born from vaccinated mothers are not protected against GBS infection. Higher mortality rates and a tendency to higher colonization in the brain and liver overtime are observed in the offspring born from vaccinated mothers compared to those born from control mothers. Moreover, 50% of the GAPDH vaccinated progenitors die after birth. Histopathological analysis of these females shows the presence of neutrophil and lymphocytes infiltrates in multiple organs with high levels of bacterium which lead us to conclude that they are dying of septicemia. This is not observed in any control female. In conclusion, GAPDH maternal vaccination tested in a mouse model that mimics the human infectious route does not confer protection to their offspring against GBS infection, in contrast to what was previously observed when an artificial route of infection was used. Our results highlight the importance of use an experimental model that mimics the human pathophysiology of the disease to predict the effectiveness of a vaccine/therapy in clinical trials.

- **15103 | Ghrelin and Leptin stimuli alter the expression of Obesity-related genes in Human Sertoli Cells**

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Obesity/overweight have reached pandemic proportions. Among the several health dysfunctions, infertility has emerged as a severe issue for women and men. Indeed, as obesity rates increase, sperm quality worldwide has decreased to worrying low levels. The hormonal dysregulation associated with obesity is responsible for the disruption of several reproductive events. Previous studies showed that leptin-ghrelin axis, which mediates body energy homeostasis, could interfere with Sertoli cells (SCs) function. Spermatogenesis is directly associated with SCs metabolism since they provide metabolic support to developing germ cells. We hypothesize that beyond the already known metabolic effects induced by the hormonal dysregulation caused by overweight/obesity, hSCs expression of obesity-related genes (ORG) also responds to leptin and ghrelin fluctuations. To test our hypothesis, hSCs were cultured during 24 hours in the absence or presence of increasing doses of leptin (5 ng/mL, 25 ng/mL, 50 ng/mL) and ghrelin (20 pM, 100 pM, 500 pM), which mimics the hormonal levels reported in undernourished, normal, obese and severely obese individuals. The expression of selected ORG (MC4R, GNPDA2 and TMEM18) was assessed by polymerase chain reaction (PCR) and quantitative PCR. Our results show that MC4R expression in hSCs is not responsive to the hormonal treatments selected. Interestingly, the expression of GNPDA2 and TMEM18 is increased after exposure to the highest concentration of leptin and ghrelin, respectively. These preliminary results show for the first time that the hormonal dysfunction caused by weight fluctuation alters the expression of ORG in hSCs. These genes interfere with several cellular functions and thus, these changes can be a pathway by which overweight promotes infertility and subfertility in males. Further studies are needed to unveil which physiological functions in SCs can be compromised by these changes in ORG expression due to ghrelin and leptin exposure.

- **15104 | Dever: Modal or Evidential Marker?**

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The purpose of this presentation is the semantic analysis of the Portuguese verb *dever* in European Portuguese, based on a set of examples constituted from a selection of the CETEMpublic *corpus*. Taking into account that in European Portuguese, evidentiality can be marked by this verb, unlike other languages, this study focuses on the analysis of *dever* as a modal epistemic marker and as a marker of evidentiality, since these two categories are distinct, although it is still assumed in the literature that evidentiality is a type of epistemic modality. Firstly, some proposals are presented and some reflections are made about modality and evidentiality based on several authors (see Aikenvald (2005), Squartini (2001), Vetters (2012), among others). In this phase of the study, we find that, unlike the Portuguese language, exist languages that have morphemes that mark the evidentiality. So we expose different examples of languages in which this happens (Haan (1997) and Vendrame-Ferrari (2012)). Secondly, we show to what extent and under what conditions *dever* is a modal and/or evidential marker (see Dendade (1994), Oliveira (2015) and Saussure (2012)). In a third moment, we carry out a systematic analysis of the data, focusing on future and conditional tenses. Finally, some conclusions and future perspectives are presented.

Keywords: *dever*, epistemic reading, modality, evidentiality, conditional, future.

- **15105 | *Gunnera tinctoria* : Preliminary Assessment of an Invasive Plant**

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Gunnera tinctoria, also known as Nalca, is a native plant from South America, being found in Azores, only in the São Miguel Island, as an invader. It is a highly competitive plant, able to successfully colonize and threaten the native Azorean forest [1]. This plant is used in Chile for various purposes [2] and this study aims to characterize its nutritional and antioxidant profiles, as a strategy of valorization.

The samples were collected in Sete Cidades, São Miguel Island, in April and September. After grouped into flowers/stems and leaves, samples were lyophilized. The nutritional characterization of the samples was assessed according to official methods [3]. In order to evaluate the antioxidant activity, spectrophotometric methods were applied, using an UV-Vis microplate reader [4], and the results were compared for each season.

The leaves presented the highest content of total dietary fiber. In turn, flower/stems were the richest part in available carbohydrates and achieved the highest values for total phenolic compounds, ferric reducing power and DPPH scavenging activity.

In general, this plant can be seen as an interesting source of dietary fiber and antioxidants.

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Acknowledgments: The authors thank the financial support to the project Operação NORTE-01-0145-FEDER-000011 and the project UID/QUI/50006/2013 - POCI/01/0145/FEDER/00726

- **15106 | Functional and comparative analysis of the oxidative status of two macroalgae species along seasons and tidal cycle**

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As sessile organisms that live in the intertidal zone, macroalgae are permanently subjected to stress due to exposure to desiccation, salinity variations, high temperatures and ultraviolet radiation. These sources of stress, can unleash several physiological processes, leading to the accumulation of reactive oxygen species, causing oxidative stress. However, the physiological responses of macroalgae to environmental constraints is still poor explored, particularly in what regard the redox homeostasis. In this context, the aim of this study was to unravel the seasonal and tidal effects on the antioxidant performance of two macroalgal species present in the North coast of Portugal: *Ascophyllum nodosum* and *Fucus serratus*. For this purpose, three sampling dates between August 2017 and August 2018 were done in low and high tide and 3 biological replicates were collected and used to the evaluation of different biochemical endpoints, such as photosynthetic pigments, hydrogen peroxide (H₂O₂), proline, lipid peroxidation (LP) and thiols. Integrating all results through a univariate analysis of variance, it was possible to infer that *F. serratus* was more sensitive to environmental variations, when compared to *A. nodosum*, and that, for both species, the oxidative damage was more evident during the low tide. Furthermore, the physiological performance of both species significantly differed between seasons: *F. serratus* was more damaged during summer, as evidenced by higher levels of LP and H₂O₂, while *A. nodosum* was more affected during spring. Overall, our results pinpoint that different intertidal macroalgae employ differential physiological mechanisms to counterbalance environmental constraints, though future research is required to fully understand this issue.

Acknowledgments: This work was developed under the Project No. 029818, co-financed by COMPETE 2020, Portugal 2020 and the EU through the ERDF, and by FCT through national funds.

- **15107 | Cyanobacteria in Skin Protection**

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Cyanobacteria are known to synthesize a wide array of secondary metabolites with biological interest. In this work, different cyanobacteria strains of the LEGE Culture Collection (<http://lege.ciimar.up.pt>) were screened for their potential use in skin care. Ethanolic extracts (70%) of the strains *Phormidium* sp. LEGE05292, *Synechocystis salina* LEGE06099, *Nodosilinea nodulosa* LEGE06102, *Cyanobium* sp. LEGE06113, *Synechocystis salina* LEGE06155, *Oscillatoriales* LEGE07167, *Cyanobium* sp. LEGE07175 and *Tychonema* sp. LEGE07196 were analyzed for their total phenolic content (TPC), by the Folin-Ciocalteu method, for carotenoids and chlorophylls, by HPLC-PDA, and for antioxidant activity by the DPPH• and superoxide anion radical (O₂•-) scavenging assays. The cytotoxicity of the extracts was evaluated in different cell lines, namely keratinocytes (HaCat), fibroblasts (3T3L1) and endothelial cells (hCMEC/D3), through the MTT assay. The potential effect of the extracts on melanin production was studied through the tyrosinase inhibitory assay. The highest carotenoids content was obtained with *S. salina* LEGE06099, with emphasis on zeaxanthin (49.8 µg g⁻¹) and lutein (79.1 µg g⁻¹). The same strain showed the highest phenolic content (2.45 mgGAEg⁻¹). Cytotoxic effects were only registered with the *Oscillatoriales* LEGE07167 and *Phormidium* sp. LEGE05292. An increase in fibroblasts viability was observed with *S. salina* LEGE06155. Regarding the antioxidant potential, *S. salina* LEGE06099 showed the best capacity to scavenge DPPH• (IC₅₀=863.82 µg mL⁻¹). On the other hand, *Phormidium* sp. LEGE05292 was the most interesting scavenger of O₂•- (IC₅₀=822.70 µg mL⁻¹). No inhibition was registered for tyrosinase. Overall, *S. salina* LEGE06099, *N. nodulosa* LEGE06102 and *S. salina* LEGE06155 evidenced an interesting potential for further exploitation with cosmetic purposes. Thus, this work emphasized cyanobacteria as an alternative source of bioactive ingredients with interest in the cosmetic industry.

- 15108 | A Theoretical study on SWCNT End-Functionalization: Intramolecular Hydrogen Bonds as a Molecular Gate

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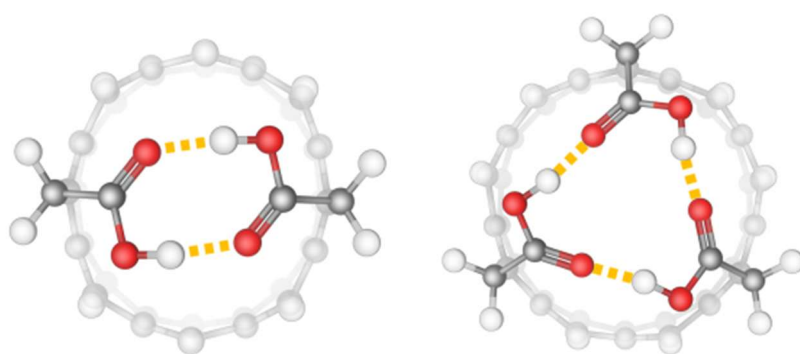
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Since their discovery, carbon nanotubes and other related nanomaterials are under the spotlight due to their unique molecular structures and properties[1]. The cage like structure of carbon nanotubes is especially appealing as a route to isolate drug molecules until they reach a specific cellular target where they can be delivered[2]. In this sense, many studies have been published concerning the topic of carbon nanotube cellular toxicity, indicating that in certain conditions the nanomaterials present very little risks, and thus suitable to the drug delivery scope[3].

Accordingly, this project aims to explore through density functional theory (DFT) calculations, a novel covalent end-functionalization of single-walled carbon nanotubes (SWCNTs). It is proposed that the end-functionalization with a carboxylic acid derivative establishes a pH sensible molecular gate, considering intramolecular hydrogen bonds between the introduced functions which prevent diffusion of molecules from inside the SWCNT to the surrounding medium. The pH sensibility of the molecular gate arises from repulsion between deprotonated functions, leading to a conformational change upon deprotonation. Furthermore, the protonated functions are also predicted to oscillate between closed and open conformations, however, it is reasonable to assume that the closed state is preferred. Preliminary results show energetic differences of 12.1 and 20.8 kcal.mol⁻¹ between protonated conformers in the gas phase for (8,0) bi-functionalized and (9,0) tri-functionalized carbon nanotubes, respectively.

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Representation of (8,0) bi-functionalized and (9,0) tri-functionalized carbon nanotubes in the closed conformation.

- **15109 | Functional relevance of MCL1 alternative 3'UTR mRNA isoforms in human cells**

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The 3' untranslated region-alternative polyadenylation (3'UTR-APA) is the most common type of APA and generates mRNA isoforms that encode the same protein but display alternative 3'UTRs. Myeloid cell leukemia 1 (Mcl-1) is an anti-apoptotic Bcl-2 family member that has a major function in cell survival. Previous results from our laboratory have shown that *MCL1* is regulated by APA in human T cells, giving rise to two mRNA isoforms, pA1 and pA2, that have alternative 3'UTRs. Since nothing is known about the functional role of the two *MCL1* mRNA isoforms generated by APA, we focused on studying their physiological impact on T cells survival and their influence in Mcl-1 protein subcellular localization. First, to study the function of *MCL1* pA1 and pA2 isoforms, we used CRISPR/Cas9 technology to generate Jurkat cells with either pA1 or pA2 isoform deletion. Genotyping using PCR and sequencing showed that editing of pA1 and pA2 occurred successfully, at least in heterozygosity. By RT-qPCR and Western blot we confirmed that deletions have an impact on *MCL1* pA1 and pA2 mRNA expression and in Mcl-1 protein levels. Flow cytometry was performed to evaluate the effect of pA1 and pA2 isoforms on T cell viability and results showed that both isoforms contribute to the anti-apoptotic function of Mcl-1. Second, we investigated the function of pA1 and pA2 on Mcl-1 subcellular localization analyzing EGFP-MCL1-pA1 and EGFP-MCL1-pA2 constructs by confocal microscopy. Our results clearly show that Mcl-1 encoded by the pA1 mRNA isoform localizes in the mitochondria, whereas the Mcl-1 derived from pA2 mRNA localizes throughout the cell and is less expressed. Taken together, our results provide new insight on the function of the two *MCL1* alternative polyadenylation isoforms by demonstrating that both contribute for the Mcl-1 anti-apoptotic function but have a distinct effect on Mcl-1 protein subcellular localization.

- **15110 | PINCH1- and PINCH2-Mediated Signaling in CNS Myelination**

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Myelin is a lipid rich membrane surrounding axons that significantly increases axonal conduction velocity. In CNS, myelination is carried out by oligodendrocytes which are responsive to different signals including those derived from the extracellular matrix (ECM). A major group of receptors for ECM molecules are integrins. Since their cytoplasmatic domains lack enzymatic activity, integrins require the recruitment of adaptor proteins such as ILK, PINCH and parvin to form signaling hubs (focal adhesions) and activate intracellular pathways. Mammals display two main PINCH proteins that bind in a mutually exclusive way to ILK, which, in turn, binds to parvin to form the IPP complex. This complex serves as an adaptor between integrin signaling and the actin cytoskeleton. In addition, the IPP interacts with several pathways, including the PI3K and MAPK pathways, which are also involved in myelination. In fact, the disruption of the complex caused by deletion of one of their components results in severe myelination deficits in PNS and CNS. The role of IPP in CNS myelination may also depend on the specific recruitment of PINCH1 or PINCH2, which alters the signaling specificity of this complex. Thus, the aim of this project is to address the functions of each PINCH protein in regulating the signaling mechanisms controlling myelination in CNS. For this, we conditionally ablated PINCH1 or PINCH2 in oligodendrocytes from mice using the Cre-lox system. Further analyses were performed using western blot, immunohistochemistry and electron microscopy techniques. Our results show that the pattern of expression of each PINCH varies differentially during the development of the CNS and that independent loss of each protein may lead to compensation mechanisms. We further show that the conditional ablation of each PINCH in oligodendrocytes causes distinct phenotypes due to distinct regulation of downstream pathways, supporting the PINCH proteins as novel mediators of CNS myelination.

- **15112 | The Footprint of Friday - notes towards a shared architecture**

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From Daniel Defoe's *The Life and Strange Surprising Adventures of Robinson Crusoe*, we study the architect in three different ways: first, as a subjectivation of a cultural condition, capable of a unique view of objects and reality; second, as an expressive agent of an idea of architecture, culture, art, language; and third, as a precursor of a communicative relationship fulfilled through architectural objects.

We start by defining the act of knowledge based on the dialectic relation between subject and object, producer of a representative reality, linked to a personal and cultural image repertoire and conditioned by the circumstance in which the subject apprehends the surrounding environment. We explore the processes of signification and culture, understanding how the representations and images made by each subject base the identity and culture of a human society.

Starting with the concept of guest, which signifies the meaning that eludes its host's intellect and hospitality, we address a pre-objective reality, born out of the relation between the body and the things that surround it, preceding the representation, signification and cogitation of the subject. At last we arrive at the concept of habit, defined as temporary result of the mutual construction of man and world, which results of dwelling, defined as a human way of being that maintains this construction ongoing.

Using the concept of home, we encounter a poetic imagination that revolutionizes language, communication and geometry, and manifests the inhabitant's legitimate search for a place of reverie and dream. Not a place tied to the will and project of its architect, but a place that evolves with the changing needs of its inhabitants, whether they're functional, symbolic, cultural, social or poetic.



- **15116 | Maternal GBS vaccination interfere with the offspring intestinal immune system development**

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Group B *Streptococcus* (GBS) is a pathogen for neonates causing life-threatening diseases. Glyceraldehyde-3-phosphate dehydrogenase (GAPDH) is a promising GBS vaccine candidate. However, since it is a highly conserved enzyme, this vaccine might recognize the commensals, which are critical for immune system development. Here we evaluate the effects of the GAPDH maternal vaccination on the offspring intestinal immune system development. BALB/c female mice were immunized with recombinant GAPDH and Alhydrogel (GAPDH-vaccinated group), Alhydrogel (sham-vaccinated group), treated with antibiotics one day before delivery until one day after birth (IAP) or left untreated. The expression of RegIII γ , Mucin 2, IL-1 β and IL-17 were quantified by RT-qPCR in the large intestine of the offspring at postnatal day 8. A significant decrease in the relative expression of all these molecules is observed in the offspring born from GAPDH-vaccinated mothers when compared to the ones born from the other groups. The number of CD11b⁺F4/80⁺CD11c⁻ macrophages, CD103⁺CD11b⁺ and CD103⁺CD11b⁻ dendritic cells, present in the lamina propria of the small intestine was also quantified. No significant differences are observed among groups. Since the group 3 innate lymphoid cells (ILC3) are a population of cells sensitive to alterations in the microbiota, the two subtypes of ILC3, NCR+ILC3 and NCR-ILC3, were evaluated. The IAP treated mothers did not get pregnant and therefore it was not possible to analyze this group. A significant decrease in the relative number of NCR-ILC3, but not in the subtype NCR+ILC3, is observed in pups born from GAPDH-vaccinated group compared to those born from mothers of the other groups. In conclusion, GAPDH maternal vaccination affects the development of the intestinal immune system of their offspring.

- **15117 | Molluscs associated with invasive and native canopy-forming macroalgae in Galiza (NW Iberian Peninsula)**

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Macroalgae are ecosystem engineers in coastal environments because they provide a wide variety of services, such as habitat creation, nutrient recycling and nutrition provision (1).

This study aimed to compare mollusc assemblages on the native algae *Bifurcaria bifurcata* R. Ross, 1958 and the invasive *Sargassum muticum* (Yendo) Fensholt, 1955 at Baldaio (Galiza, NW Iberian Peninsula) as an indicator of how non-indigenous species alter ecosystems. Molluscs were selected as model because they live frequently associated with macroalgae (1).

For this aim, six replicates of both macroalgae were collected, preserved in 4% formalin and washed through a 0,5mm mesh sieve to remove the present epifauna. Then macroalgal dried weight was determined. Posteriorly, mollusks present in each replicate were determined to the lowest possible taxonomic level.

Multivariate analyses were done based on a design with the factor macroalgae (fixed) and biomass as a covariable to test significant on the number of individuals (N), species richness (S), Shannon-Wiener index (H') and community composition of the molluscs between native and invasive macroalgae.

The invasive macroalga showed a higher N and S (2685 individuals and 17 taxa) than the native (424 individuals and 16 taxa). Significant differences were found for N and the structure of mollusc assemblage. Furthermore, SIMPER analysis showed a dissimilarity of 59,40% between macroalgae. 16 taxonomic groups were responsible for most of it. Within these, *Rissoa parva* (da Costa, 1778) and *Mytilus galloprovincialis* Lamarck, 1819 were the greatest contributors.

Concluding, the invasive *S. muticum* and the native *B. bifurcata* were significantly different in terms of total number of individuals and the structure of mollusc assemblages.

Keywords: Molluscs, native macroalgae, invasive macroalgae, NW Galicia, diversity

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- 15118 | β 3 adrenoceptor-mediated inhibition of the rat urinary bladder function involves activation of the EPAC/PKC/ENT1 pathway downstream cyclic AMP production

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Detrusor-located β 3-adrenoceptors inhibit cholinergic neurotransmission in human and rat urinary bladders indirectly by releasing adenosine via type I equilibrative nucleoside transporters (ENT1) and retrograde activation of inhibitory pre-synaptic A1 receptors (Silva et al., 2017, *Am J Physiol Renal Physiol*). This mechanism might explain the therapeutic success of β 3-adrenoceptor agonists to control overactive bladder syndromes. Adrenoceptors normally couple to the adenylate cyclase / cAMP pathway. Cyclic AMP targets ubiquitously expressed protein kinase A (PKA) and/or exchange protein directly activated by cAMP (EPAC) inside eukaryotic cells. Here, we investigated the most relevant cAMP responsive element participating in β 3-adrenoceptors-induced inhibition in the rat urinary bladder. Intravesical isoprenaline (ISO, 0.001-100 μ M, β -agonist) and forskolin (FSK, 0.030-10 μ M, an adenylate cyclase activator) reduced the voiding frequency of urethane-anaesthetized rats. The inhibitory effects of ISO and FSK were both prevented by inhibiting EPAC and protein kinase C (PKC) with ESI-09 (10 μ M) and chelerythrine (CHL, 5 μ M), respectively, but not when PKA was inhibited with H-89 (10 μ M). ISO (1 μ M) and FSK (3 μ M) also reduced the release of [3H]ACh from urothelium-denuded detrusor strips stimulated electrically (10 Hz, 200 pulses). ISO (1 μ M)-induced inhibition of [3H]ACh release was prevented by ESI-09 (10 μ M), CHL (5 μ M) and the ENT1 inhibitor, dipyridamole (0.5 μ M), but not by inhibition of phospholipase C and PKA with U73122 (3 μ M) and H-89 (10 μ M), respectively. PKC activation with PMA (10 μ M) mimicked the inhibitory effect of isoprenaline and its effect was also prevented by dipyridamole (0.5 μ M). Data suggest that β 3-adrenoceptor-induced inhibition of cholinergic neurotransmission in the rat urinary bladder involves activation of the EPAC/PKC pathway downstream cAMP production leading to adenosine outflow through ENT1.

Work supported by FCT (UID/BIM/04308/2016)

- **15119 | Electoral policies, political-economic cycles and electoral results**

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When voters expectations are adaptive, incumbent politicians increase public expenditure near the end of term in order to maximize the probability of being reelected, Veiga and Veiga (2004). In this paper we evaluate if, after the 2011 sovereign debt crises, politicians continue this strategy and also whether voters are rational in the sense that they are not influenced by the opportunist politicians.

We use Pordata database for the years 2010-2017 (unemployment rate as control variable for the business cycle; current and capital municipalities' public expenditure and election results for 2013 and 2017), a total of 616 observations.

To assess whether incumbent politicians increase public expenditure near the end of term, we computed the increase in the public expenditure in the two final years relatively to the one on the two initial years. We observed that, on average, current expenditure increases 9.4% and capital expenditure decreases 15.8%, both significant at 0.1% level. These results show that incumbent politicians continue to follow an opportunistic model, as observed by Veiga and Veiga (2004).

To assess if voters are rational, we estimate an econometric model where the dependent variable is the electoral result and independent variables are unemployment rate and the increase in current and capital expenditure. The null hypothesis "The voters expectations are adaptive" is rejected due to the fact that the parameters associated with expenditure are negative and significant, result that is contrary to Veiga and Veiga (2004).

Concluding, used model shows that incumbent politicians continue to follow an opportunistic model as observed by Veiga and Veiga (2004) but, voters expectations become rational (*i.e.*, increasing public expenditure near elections day does not improve incumbents' electoral results), that is contrary to Veiga and Veiga (2004).

- **15121 | Manuel Botelho. Houses.**

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Despite the long period of teaching that began at the Escola Superior das Belas Artes (1980-1985) and continued at the Faculty of Architecture of the University of Oporto (1985-2009), Manuel Botelho always maintained an autonomous and distinct course of the vortices that characterize the School of Oporto; result, we believe, of the uniqueness of his education. Born in Rua, Viseu, Manuel Botelho grows in a deeply rural environment and marked by a religious education that culminates with the experience of the priesthood, to which he will eventually resign. Meanwhile, he travels to Italy where he attends, at first, Philosophy at the Gregorian College and only after (at the age of 32) he joins the Faculty of Architecture at the University of Rome - La Sapienza. In this environment, marked by the presence of professors like Leonardo Benevolo, Bruno Zévi, Achille Bonito Oliva and, with particular importance, Ludovico Quaroni, Manuel Botelho will construct his critical posture on the architectural practice. After completing the course in 1978, the architect returns to Portugal where he begins, in parallel with the pedagogical activity, the exercise of a liberal professional.

From the set of his constructed work we chose the housing typology and, particularly, five single-family houses built of root: the Barroso Pires' house (Ponte da Barca, 1984-87), the Ricardo Teles' house (Cinfães, 1986-1991); the Eng. Nunes de Sousa's house (Porto, 1988-1997); the Maia Ribeiro's house (Maia, 1994-2001); and the Paulo Pires' house (Lamego, 2000-2011). The selection has been carried out over a period of more than 30 years, which allows us to understand the recurrences present in the development of the projects as well as the evolution of his practice. As a conclusion, we seek to identify some links between the biography, the aesthetic/conceptual references and the works of the architect in order to recognize the coherence of his approach.

- **15122 | Optimization of the microwave-assisted synthesis of CdTe quantum dots capped with TGA**

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Quantum dots (QDs) are semiconductor nanocrystals that have dimension in the nanometer scale, therefore have unique optical properties [1]. In last years, QDs have been very important due to their varied applicability. These can be used in electronic devices, biological probes and analytical sensors.

Recently, the aqueous synthesis of cadmium telluride (CdTe) QDs capped with thiol based stabilizing agents has been much studied, because of its advantages. Among others, it is important to mention the simplicity of synthesis, the excellent optical properties with ability to manipulate these as in a "tailor-made" approach, their water compatibility and their ability to emit light over a wide range of wavelengths.

The aim of this work was the optimization of aqueous-based synthesis of CdTe QDs capped with thioglycolic acid (TGA) assisted by microwave. Based on this method, different molar ratios of Cd:Te and Cd:TGA and pH values were tested in order to obtain higher quantum yield and controlled photoluminescence emission band. Together with the previous mentioned parameters, the time of reaction and temperature during synthesis was also studied. The analysis of the influence of all parameters was made using predetermined designs of the experiments.

ACKNOWLEDGEMENTS:

This work received financial support from the European Union (FEDER funds POCI/01/0145/FEDER/007265) and National Funds (FCT/MEC, Fundação para a Ciência e Tecnologia and Ministério da Educação e Ciência) under the Partnership Agreement PT2020 UID/QUI/50006/2013.

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- **15124 | Collecting atmospheres, the Italian Palace - Bardini Museum**

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The present research aims to understand a building that can be comprehended as a collection of particular spaces – the Bardini Museum in Italy – as a means to interpret architectural narratives within contemporary poetics.

Through an in-depth reading – from general to particular – it is fundamental to underline the growth and evolution of this building and its relation to the urban mesh in order to understand how the palace was built, within the notion of place and time.

The Bardini Museum, a nineteenth century palace in the city of Florence, is characterized by a very diverse and distinctive collection of paintings, sculptures and artefacts from different eras. Nevertheless, its Bardini's interpretations and inventiveness of space that creates an unique architectural structure, mainly through the conjugation of stylistic fragments, compositional variety and juxtaposition of vertical and horizontal readings that characterize the atmosphere present in each room.

Clearly, more than a collection of artworks we can speak of a collection of atmospheres, through an identity of personal and non-historic taste composed by several rooms of unique character, crafted by Bardini himself, in order to interpret a particular promenade in a museum like ambience.

There is certainly an appeal to the binomial body-space relation that gives potential to the experience and dialogue between art and architecture, set in an historically multi-layered structure evoking a poetic intake on new tools, narratives and procedures, opening the possibility of a future intervention or extension.

This research is currently underway within the master thesis integrated on Master's Degree in Architecture, at FAUP, 2018/2019, under the supervision of Professor Helder Casal Ribeiro.

- **15125 | Computational study of ion selective separation through graphene nanowindows in solution**

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Since its isolation in 2004, graphene has been one of the most renowned compounds in the materials field. Graphene is a single atomic plane of graphite with potential for a wide range of applications, which have been already reported, due to its characteristics, such as one-atom-thickness, robustness and chemical stability [1].

The usage of graphene sheets as a membrane for separation of gases or ions in solution was one of the first applications to be described in the literature, as their single-atom-thick wall can provide almost negligible resistance to permeation. Although pristine graphene and defective graphene are impermeable even to the smallest gas Helium [2], it is possible to create holes in graphene sheets that can allow the selective passage of water, ions and gases.

This project aims at studying molecular sieving properties of porous graphene, using density functional theory (DFT) calculations. The rim-chemistry of different functionalization of the nanowindows (pores created in graphene) can alter the permeation rate of molecules through the graphene membrane. Another important aspect to study is the opening and closing of nanowindows due to the difference in the functionalization of the pore [3], and due to some binding with the nanopore groups [4].

Current work has been focused on building a suitable quantum computational model based on recent and accurate DFT functionals. Preliminary results have shown a good comparison to previous studies based on classical molecular dynamics (MD), in which a 2,73 Å wide nanowindow, functionalized with a hydroxyl and an ether group, is able to permeate O₂. Two stationary states, open and close nanowindow, are observed with a difference in energy of $\Delta E = 1,3$ kJ/mol [3].

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- 15126 | Establishment of a human model of intervertebral disc degeneration and associated immune response

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Intervertebral disc (IVD) degeneration is considered to be one of the major causes for lower back pain (LBP). Macrophages (Mac) play a major role in inflammation and have been identified in IVD degenerated samples. The role of IVD degeneration in associated inflammation and pain is not fully understood. This is due to the lack of animal models that mimic the process of human IVD degeneration.

We proposed to establish an ex vivo model of human degenerated IVD and to study how the degenerated human IVD (hIVD) influences Mac polarization.

Human IVD biopsies collected were separated into contained versus extruded hernias and first characterized by histology and immunohistochemistry. hIVD fragments were dissected into nucleus pulposus (NP), annulus fibrosus (AF) and cultured with and without interleukin (IL)-1 β , for 7 days. NP and AF metabolic activity and production of pro-inflammatory cytokines were measured.

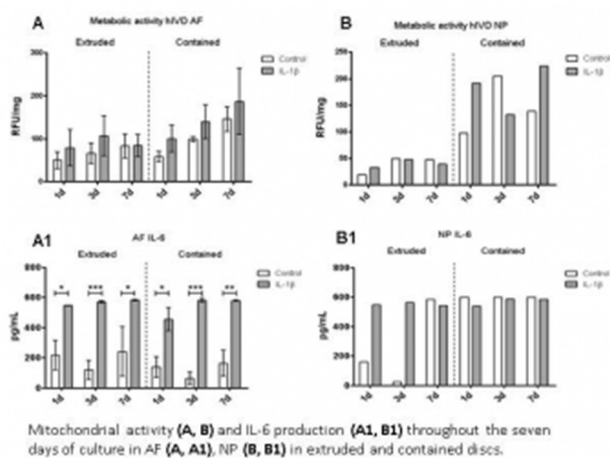
Human blood-derived monocytes/Mac were isolated and co-cultured with hIVD tissues for 7 days and Mac metabolic activity, phenotype and production of inflammatory cytokines were also assessed.

Our results show a linear correlation between the number of cells per cell cluster with age ($R^2=0.63$), in contained hernias. Infiltrated macrophages (CD68+) were detected, cells CD68+ were predominantly M1 macrophages (CCR7+) but M2a Mac were also found (CD206+).

Contained hernias group seemed to have a higher mitochondrial metabolic activity compared with extruded hernias. Stimulation with IL-1 β increased metabolic activity and IL-6 production in AF of both groups.

When co-cultured with hIVD samples and IL-1 β , metabolic activity of Mac increased and also IL-6 production augmented. Surface expression of CD86 or HLA-DR did not clearly indicate Mac polarization towards M1 phenotype.

We established a human-based ex vivo model of hIVD degeneration allowing the study of IVD/Mac crosstalk and opening new perspectives to identify new therapeutic approaches for LBP.



Mitochondrial activity (A, B) and IL-6 production (A1, B1) throughout the seven days of culture in AF (A, A1), NP (B, B1) in extruded and contained discs.

- **15128 | The dignity of the human person in pandering: Legal Paternalism or Unconstitutionality?**

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At the very core of the discussion about the phenomenon of prostitution, there are antagonistic legal dogmas which all concern and aim to protect the human rights of sex workers.

In the Portuguese panorama, we are taken back to 1983, year in which the Decree-Law no. 400/82 entered into force, repealing article 1 of the Decree-Law no. 44579 of 1962, which outlawed prostitution. The former legal diploma decriminalized prostitution and criminalized pandering, which is currently legally defined in article 169 of the Portuguese Penal Code. Specifically, this article criminalises whoever incites, favours or facilitates another person's engagement in prostitution.

Therefore, and despite not being legalized, prostitution is not criminalized either, leading to the existence of a legislative vacuum that neither regulates nor punishes, but rather ignores the activity.

Throughout the communication, we seek to review article 169(1) of the Portuguese Penal Code, from a reflection based on the principle of human dignity, especially per a perspective of Kantian theory, the "object-formula" developed by Dürig.

In fact, the principle of human dignity may be viewed from two different perspectives: as an absolute limit to the possibility of waiver of fundamental rights, and also as legal basis to the very own right to waive certain acts protected by fundamental rights - thus prevailing the autonomy of the will of the individual, as an expression of their dignity.

According to the aforementioned, on this matter, it is relevant to mention two rulings of the Portuguese Constitutional Court: ruling no. 144/2004, as well as ruling no. 641/2016, which declared article 169(1) of the Portuguese Penal Code constitutional. However, there is legal doctrine, as well as dissenting opinions in the previous rulings, which defend the unconstitutionality of the above-mentioned article. This communication is grounded in that line of reasoning and seeks to further explore some of these legal arguments.

- **15129 | Development of a sequential injection analysis system to determine the concentrations of lactate in human samples**

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Lactate is generally present in human blood at very low concentrations and its production is traditionally an anaerobic event [1]. However, lactate is considered a signalling molecule promoting specific immune inflammatory responses since its levels increases according to the grade of inflammation. In physiological conditions, lactate concentrations are between 1.5-3 mM in blood and healthy tissues. However, in inflammatory pathologies, lactate levels rise to 10 mM and in cancer, tissues can increase until 30-40 mM [2].

To determine the lactate concentrations in human samples it was developed a sequential injection analysis system. The reactions take place in a confined space and the computer control assure the precise reaction conditions, in the solutions mixture and in the detection process [3]. The reaction for determine lactate concentrations is based on the conversion of lactate in pyruvate by lactate dehydrogenase. This enzymatic reaction occurs in the presence of nicotinamide adenine dinucleotide that is converted in nicotinamide-adenine dinucleotide reduced which upon excitation at 390 nm emits a fluorescence signal at 470 nm.

The effects of several parameters on the reactions were tested, such as reagents concentration, volumes, and aspiration order, pH, reaction time and selected the best ones to get accuracy and quickness in the execution of the enzymatic assay.

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Acknowledgments

Financial support from the European Union (FEDER funds POCI/01/0145/FEDER/007265) and National Funds (FCT/MEC, under Partnership PT2020UID/QUI/50006/2013, FEDER Funds through the COMPETE and by FCT - within the scope of the project POCI-01-0145-FEDER-030163. M.P. thanks FCT for the financia support.

- **15130 | Strong Magnetoelectric Effect and Spin-Phonon Coupling in Fe-substituted TbMnO₃**

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Magnetoelectric multiferroics, such as orthorhombic rare-earth manganites, where both magnetic and ferroelectric orders are coupled, have attracted a great interest as they are crucial to magnetoelectric devices processing. In the case of TbMnO₃, an incommensurate sinusoidal collinear order of the Mn spins occurs at $T_N = 41\text{K}$, wherein the Mn spins lie in the bc-plane (Pbnm setting). Below $T_{\text{lock}} = 28\text{K}$, a magnetic transition occurs into a commensurate cycloidal spin order with Mn spins rotating in bc-plane, compatible with the stabilization of an improper ferroelectric polarization along the c-axis [1, 2]. Furthermore, it is possible to magnetically control the polarization, as a magnetic field along the b-axis rotates the cycloidal spin order to the ab-plane, and thus the electric polarization to the a-axis [1].

One way to tune the magnetoelectric coupling is by chemical substitution in TbMnO₃. The work done in ceramics shows that the substitution of Mn³⁺ by small amounts of Fe³⁺ profoundly changes the magnetic structure, altering the magnetoelectric coupling [3]. However, these studies were done in ceramics, and thus anisotropic effects cannot be ascertained, such as the flop of the cycloidal plane with an applied magnetic field.

In this work, we used oriented single crystals of TbMn_{1-x}Fe_xO₃ with $x = 2, 4$ and 6% to measure polar and dielectric properties versus temperature and magnetic field along the crystallographic directions, as well as lattice dynamics, magnetic excitations and spin-phonon coupling through Raman spectroscopy. The obtained results will be presented emphasizing the effect of temperature and magnetic field on the physical properties for the different x-values. One major outcome of this study is the invariance of the electric polarization direction with increasing iron concentration.

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- **15132 | Families in Museums: Proposal for the Casa-Museu Marta Ortigão Sampaio**

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Museums are places with an increasingly strong educational and social function. At the same time, it is necessary to develop connections with the public through strategies that support learning in their spaces. Although they have a significant influence on the number of visitors in leisure facilities and museums, families are a group for which there aren't many studies in the national context. Similarly, very few museums have programmes specifically for this audience.

The Report aims to present a summary review of the bibliography on this topic and a reflection on the curricular internship at the Casa-Museu Marta Ortigão Sampaio. It's also proposed a family activity to be applied in the Casa-Museu, and the creation of a fold-out to support family visits. To do so, the methodology contemplated the review of the bibliography on this topic, the data collection about educational programs for families in certain international and national museums (including Museus Municipais do Porto), and a case study that took form as the internship at the Casa-Museu. This permitted to explore issues such as What are families? What characteristics do they have? Why do they visit museums? What kind of programmes are planned to families? What difficulties do they feel during the visit? What are the implications of family characteristics in museum practices? How do Museus Municipais do Porto see families? What do Museus Municipais do Porto offer to families who visit them?

As main results, families are presented as a multigenerational group with a variable composition, allowing to find different family types in contemporary society. The internship was essential to know the space, public, dynamics and potential of the Casa-Museu, showing that families aren't the large slice among the visiting public, but that the desire for changing the panorama is present.

Keywords: families; educational sector; Museus Municipais do Porto; education policies and practices

- **15135 | Modelling the Absorption Spectra of Polycyclic Aromatic Hydrocarbons over Seoul, South Korea**

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The effect of light-absorbing atmospheric particles on climate forcing has been integrated into climate models [1]. More, the absence of brown carbon (BrC) in these models has caused the existence of significant differences between model predictions and measured data on radiative forcing [2]. However, making quantitative predictions of the contribution of BrC has been a challenging task for experimental approaches, resulting in high uncertainties in the prediction and mitigation of BrC.

Herein, we have used a density functional theory (DFT) approach to generate models for the "real-world" absorption of BrC. Namely, we have used as case-study the absorption of polycyclic aromatic hydrocarbons (PAHs) measured experimentally in the atmosphere over Seoul (South Korea).

Our models were able to identify the more relevant UV and visible regions for the light absorption spectrum of the PAHs and to decompose these relevant bands to contributions attributable to individual molecules. It allowed us also to determine and understand changes in the combined absorption spectrum of PAHs to the seasonal variation of their concentration, helping to identify the most problematic season of the year for climate forcing.

This information is essential for developing global models able to predict the climate effects of BrC. It also shows the advantages that DFT calculations can bring to the study of the effects of light-absorbing atmospheric particles on climate forcing.

Acknowledgments

Projects NORTE-01-00145-FEDER-000028 and POCI-01-0145-FEDER-006980.

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- **15136 | Drug-protein binding of chiral derivatives of xanthenes to immobilized human serum albumin by bioaffinity chromatography**

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High-performance affinity chromatography is a type of liquid chromatography that has become extremely useful and widely used to study intermolecular interactions between biotargets and drugs. This method is based on drug affinity to a biologically-related stationary phase [1].

Fast and convenient determination of drug plasma-protein interactions in early drug discovery by employing a human serum albumin (HSA) affinity column, which may predict how drugs behave in the human body, is one of the advantages of this method [2].

In this study, the binding affinity of a library of chiral derivatives of xanthenes (CDXs) on a HSA chiral stationary phase (CSP) has been determined by bioaffinity chromatography, by measuring the retention times using mobile phases with different proportions of organic modifier, to allow the extrapolation to 100% aqueous buffer, and further calculation of compound bound percentage.

In general, high affinity for HSA-CSP was observed, with bound percentage ranging from 79.02% to 99.99%.

Considering the importance of understanding the chiral recognition mechanisms associated with the chromatographic enantioresolution, computational studies by molecular docking were also carried out. The docking calculations were in accordance with the experimental chromatographic parameters regarding enantiomer elution order, with a success rate of 77%.

Acknowledgements

This research was developed under projects PTDC/ MAR-BIO/4694/2014 and PTDC/AAG-TEC/0739/2014 supported through national funds by FCT/MCTES, PIDDAC and ERDF through the COMPETE - POFC programme (POCI-01-0145-FEDER-016790 and POCI-01-0145-FEDER-016793) and RIDTI, Project 3599 and 9471, in the framework of the programme PT2020, as well as Project No. POCI-01-0145-FEDER-028736, co-financed by COMPETE 2020, Portugal 2020 and the European Union through the ERDF, by FCT, and CHIRALXANT-CESPU-2018.

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- **15137 | Tool, process, strategy: Caldas do Moledo as a methodological laboratory of the metamorphosis of Time and Place in the architectural landscapes of Douro**

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The present work thrives from the desire to participate in the revision of contemporary methods of seeing, thinking and intervening in 'architectural landscapes'. Through the proposal of an 'Instrument', 'Process' and 'Strategy' it is hoped to contribute to the construction of current urban realities, having Douro and Caldas do Moledo as a methodological laboratory of these premises.

Caldas do Moledo, known as the entrance gate to the heart of the Douro landscape thanks to its strategic position on the right bank of the river, has always been of great importance in the economic, cultural and social exchange of this region. In spite of the marked predominance of the vineyard's monoculture, it presents pluralities along its extent, constituting an urban set greatly due to the action of one of the most outstanding personalities of the Douro, 'Ferreirinha'. New centralities emerge evolve in the region, and places like Caldas do Moledo, once a feature in the landscape, now a memory of other times, are suspended in time. The construction of a strategy seeks to articulate the possibilities of recovering a place that, although constrained by the passage of time, holds potentialities within the contemporary dynamics, both locally and regionally. It will be presented a vision that does not follow the superficial images of the Douro's tourism, seeking instead to value different qualities and atmospheres, the Genius Loci.

Through a work method based on the physical and formal analysis of social, cultural and economic dynamics, an attempt will be made to highlight the fundamental principles of action that arise from the perception of the values and identities of this territory. It is essential to carefully preserve and transform the material and immaterial heritage of the Douro Region, focused here in Caldas do Moledo, as much as it is imperative to reconstruct a discourse that joins tradition and progress, truly representative of a 'Cultural, Evolving and Living Landscape'.

- **15139 | The impulse of belonging: the influence of social identity on impulse buying of Portuguese youth**

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Impulsive buying has become a relevant subject in the context of consumer influence, since it is complex, wide-ranging and with varied influences, which can be manifested in innumerable factors, such as product discount or brand. This type of buying that derives from an emotional response appreciably positive, is not the same for all ages, with the young population being more likely to do so because of their membership towards a social group. However, it is still subject to analysis by the scientific community.

The aim of this study is to understand the effect stored by a product's quotation for a particular brand and its discount on the tendency to buy by a group of Portuguese youngsters, such as between 18 and 25 years, considering its social identity with this group, as well as if this same tendency is influenced by the positive emotions felt in relation to the buying scenario, and also, if the attitude towards the brand influences this tendency. For this, an experimental study was conducted with 545 youths, who answered an online questionnaire about an experimental scenario of buying Adidas shoes.

The results indicated that the greater the identification with the young Portuguese, the greater the positive emotions felt before a valued product, causing impulse buying tendency. The discount triggered this impulse of purchase even more and there was an ownership of the brand by the group.

Key words: Impulse buying tendency, Emotions, Discount, Portuguese Youth, Brand, Social identity.

- **15140 | UPC-53: A PROMISING MUTANT P53 REACTIVATOR WITH IN VIVO ANTITUMOR ACTIVITY**

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The tumor suppressor protein p53 is a transcription factor that regulates important cellular processes, including DNA repair, cell cycle, and apoptosis. Inactivation of p53 by mutation occurs in 50% of human cancers and relates to poor prognosis. p53 mutation leads to loss of p53 DNA-binding ability and subsequent transcriptional activity. Pharmacological reactivation of mutant (mut)p53, by restoration of wild-type-like function, is an appealing anticancer therapeutic approach [1].

Herein, we report the identification of a new reactivator of mutp53, the compound UPC-53. UPC-53 showed a pronounced anti-proliferative activity against mutp53-expressing tumor cells. Additionally, it markedly inhibited the growth of p53-null tumor cells ectopically expressing distinct mutp53 forms. In mutp53-expressing SW837 cells, UPC-53 caused cell cycle arrest and apoptosis, and up-regulated the protein and mRNA expression levels of several p53 target genes. In addition, UPC-53 caused mutp53 thermal stabilization, pointing to a possible interaction with mutp53. Importantly, UPC-53 displayed in vivo antitumor activity, with no apparent toxic side effects, in nude mice carrying SW837 xenografts. Collectively, these results support the potential of UPC-53 as an anticancer drug candidate.

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Acknowledgments:

This research was partially supported by the Strategic Funding UID/Multi/04378/2013 through national funds provided by FCT - Foundation for Science and Technology and European Regional Development Fund (ERDF), in the framework of the programme PT2020, and the project (3599-PPCDT) PTDC/DTP-FTO/1981/2014 - POCI-01-0145-FEDER-01658. Helena Ramos thanks FCT for her fellowship (SFRH/BD/119144/2016), and the BiotechHealth Programme (Doctoral Programme on Cellular and Molecular Biotechnology Applied to Health Sciences; PD/00016/2012).

- **15144 | Values of pornography: What is the relation between Basic Human Values and attitudes towards pornography?**

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Nowadays, the consumption of pornography is more and more common. Pornography is understood as any material that conveys sexually explicit images to trigger sexual excitement or fantasy. The literature has focused mainly on the relationship between consumption and its harmful effects. In this sense, it is important to know which factors are related to different attitudes towards pornography. The aim of this exploratory study was to verify the relationship between Basic Human Values and attitudes towards pornography. The participants were 298 Portuguese adults (178 females, 113 males, and 7 of another gender), with an average age of 24.9 ($SD = 7.93$), who answered the Basic Values Questionnaire (Marques, Silva, Taveira, & Gouveia, 2016) and the Pornographic Materials Use Attitudes Scale (Guerra, Andrade, & Dias, 2004). Participants were volunteers, recruited by email and social network. Before answering the online questionnaire, the participants agreed to participate in the study by signing informed consent forms. Pearson's r correlation analysis was performed. Results show that the value System of Excitement (Emotion, Pleasure, and Sexuality) and Promotion (Power and Prestige) are positively correlated with the positive attitudes towards pornography and beneficial effects of pornography, and negatively correlated with the harmful effects. As opposed, Normative values System (Religiosity and Obedience) are negatively correlated with the positive attitudes towards pornography, as well as with the beneficial effects of pornography. Lastly, Interactive values System (Support and Affectivity) are positively correlated with the harmful effects of pornography. This study highlights the importance of values as results reveal that those who appreciate values related to personal goals have different attitudes towards pornography than those who appreciate values related to social goals.

- **15145 | Potential use of carbon dots as organocatalysts for CO₂ conversion into heterocyclic carbonates**

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Despite its harmful effects, CO₂ can be seen as an abundant, renewable, cheap and non toxic source of C1 building blocks. Namely, CO₂ can react with epoxides, originating heterocyclic carbonates which are widely used as raw materials for the synthesis of several compounds. The development of synthetic methodologies that allow CO₂ to be integrated as a renewable carbon source might lead lower our dependence on fossil fuels for the obtainence of raw materials.

There have been great efforts for the development of organocatalysts that allow this process to happen. In these systems, the first step is a nucleophilic attack targeting the epoxide ring that causes the opening of the ring and the formation of an oxyanion. This is followed by the carbon dioxide cycloaddition, leading to the formation of an heterocyclic carbonate while liberating the nucleophile.

Several nucleophiles have emerged as a solution in systems for CO₂ conversion. This is based on the fact that these compounds interact with the epoxide through a nucleophilic attack that targets the epoxide ring. This facilitates the opening of the ring, which is required for the conversion to happen. Despite some new discoveries regarding the use of such compounds, there are still few organocatalysts that are truly effective. This in part is caused by our lack of knowledge regarding the relevant factors for the reactional steps in the conversion. This being said, it is difficult to understand what effect is truly caused by the nucleophiles.

This work aims to obtain new insights about the potential use of carbon dots (CDs), which are carbon nanoparticles, as nucleophiles in the conversion of CO₂ with particular emphasis in the epoxide ring opening step. To do so, we evaluated the capacities of CDs regarding an model epoxide (propylene oxide) ring opening. Since propylene oxide has no absorption in the UV region, we opted to focus our analysis on the properties of CDs by HPLC and fluorescence studies.

- **15146 | TRANSVERSE TRANSGRESSION: LOOKING FOR A POETICS OF TRANSFIGURATION**

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From readings of Al Berto's literary work *Lunário* (1988), this research looks at the imagery of a transgressive body, its marginalization and corresponding interaction with the overall social field. Urban, stray and melancholic, this body moves at night, self-conscious of its non-existent weight within the cityscape. Thus, this study aims at the exploration of identity transfiguration as a motto for artistic programs, based in the book's character Beno. The transgression of gender norms and its traverse across other artistic expressions are the basis of a research which looks after the decoding of a poetics of transfiguration in Queer Theory and Performance Studies. It is yet intended to link both concepts of persona and gender performativity with the notions of ethics and aesthetics, while looking at this body as a mutually political and artistic object. Beno is, then, the representation of the ghettoization of the queer body, similar to those shown in *Paris is Burning* (LIVINGSTON, 1990). He is as well the representation of a surviving body to the HIV epidemic, to which António Variações - transgressive artist - didn't withstand to. In addition, he dialogues with every cross-border and nocturnal body - smugglers, prostitutes, homeless people, activists, among others - as those embodied in Almodóvar's work. In this way, Al Berto is the starting point for a research project focused in having a transdisciplinary and interartistic approach to the misanthrope and faithless ethos, whose transfigured identity awards it an alley within the urban space.

Key words: Al Berto; transgression; identity; intermediality; queer; performance

- **15149 | The foreigners' right to Social Integration Income**

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This paper is a response and commentary to the ruling number 296/2015 of the Portuguese Constitutional Court that considered unconstitutional, in an abstract review of constitutionality, the article 6, number 1, paragraph b and number 4 of the law number 13/2003 of May 23, due to the violation of the principle of proportionality. The wording of said article proclaimed that foreigners can't obtain the Social Integration Income until they've legally resided in Portugal for 3 years. This paper focus on explaining a different perspective, defending the constitutionality of aforesaid legal condition, following the losing vote issued by the Judge Pedro Machete.

Unquestionably, it's certain that the Social Integration Income is a provision that ensures a dignified life and that completely banning it to foreigners is an explicit violation of article 13 and 15 of the Constitution. Nevertheless, it seems that the condition of having legal residency for 3 years in the country is an adequate and not excessive measure. The Judge Pedro Machete presents five reasons to support this affirmation and the constitutionality of this legal policy: (1) the overvaluation of the Social Integration Income, (2) the insufficiency of available data, (3) the legal residence requirement as a regulation of the principle of assimilation, (4) the legislator's freedom of interpretation and (5) the fact that the control of proportionality should be done from a negative standpoint.

Throughout this paper it is explained and proved why these reasons are valid enough to justify the constitutionality of this clause, presenting the perspectives of the Portuguese doctrine about this subject, as well as jurisprudence of the Constitutional Court that allows to conclude that the decision of said court could have been different. Furthermore, it's observed that there is an argument that the Constitutional Court could have applied and didn't: the principle of non-social regression.

- **15150 | Development of Spectral Imaging-FISH technology to study the diversity and spatial organization of gastric microbiota**

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Understanding how the microbial communities drive diseases or health could be the key to improve therapeutic strategies to combat or prevent gastric diseases, and for that, a technology that provides information about the spatial organization of the microbiota within stomach is paramount. As the number of microorganisms that can be discriminated by conventional Fluorescent in situ hybridization (FISH) technique is usually limited to three targets, another new technology, called Combinatorial Labeling and Spectral Imaging-FISH (CLASI-FISH), is developing. The CLASI-FISH technique is able to discriminate many microorganisms simultaneously, since the methodology allows the identification of fluorophores with overlapping spectra.

In a first stage of this project, FISH technique using an universal Eubacteria LNA/2'OMe probe (EUB388) coupled to 11 different fluorophores (Pacific Blue, Alexa Fluor 405, Alexa Fluor 488, Alexa Fluor 514, ATTO 532, ATTO 550, Rhodamine RedX, Alexa Fluor 594, DY 615, ATTO 633 and ATTO 655) was applied to *Escherichia coli*. We have demonstrated an extraordinary ability to distinguish fluorophores with highly overlapping emission spectra by combining both excitation and emission spectral data in a single linear unmixing algorithm. The results demonstrated that, using spectral imaging on Leica TCS SP5 Confocal, we can discriminate 8 fluorochromes (Alexa Fluor 405, Alexa Fluor 488, Alexa Fluor 514, ATTO 532, ATTO 550, Alexa Fluor 594, ATTO 633 and ATTO 655) in a multiplex assay (simultaneous detection in a single sample).

Hence, we believe that this technique holds great promise for the analysis of spatial organization of microbiotas.

- 15151 | Semantic readings of the Simple Present in radio news (oral) and online newspapers (written)

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The Simple Present in European Portuguese is a tense that can be used to refer to the past, to the present itself and also to the future. In both oral and written registers, this is one of the most used tenses. Even though these are versatile times, we can see that there isn't a great number of studies about it and its semantic values. Some of the existing studies about this matter are from Lopes (1995), Silvano (2002), Tavares (2005), Baldé (2013) e Dala (2013). Throughout this study we will analyse the semantic values of the Simple Present in radio news (oral) and in news from online newspapers (written). The main goals are, on the one hand, to contribute to the semantic characterization of this verbal tense and, on the other hand, to verify if there are differences in the use of this tense within the same genre, the journalistic one, but in different records, both oral and written.

The collected corpus constituted by radio (collected from Radio Renascença, TSF and Antena 1) and by online newspapers (collected from Diário de Notícias, Jornal de Notícias and Público). Initially I proceeded with the accounting of all existing verb tenses in the corpus and I gathered the ones that I found in the present simple making an analysis of its semantic values.

This research allowed us to conclude that in the analysed data the most frequent interpretations of the Simple Present are of Pré-Presente and Presente Real, seldom occurring the interpretations of Futurate Present, a Present with a future value, of Habitual Present and of Generic Present. We can also observe other values which are not described in the literature: a Present with an interpretation typical of a Progressive Present, a Present with an interpretation that resembles that of the Pretérito Perfeito Composto ('Present Perfect') and a Present that which situations in different time intervals.

- **15152 | Incremental Tensor Factorization for Recommender Systems**

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Nowadays, most platforms, tools and content sharing applications have content that is specifically relevant for some users. As such, there is a general concern for making the right content available to the right users. This is a tricky problem and it is typically solved by collecting some initial user behavioural data and then, by establishing either explicit or implicit similarity relations between like-minded users, recommending content that is, hopefully, relevant and adequate. The novel challenge resides in both achieving proper recommendations as well as doing it with speed, in an ever-faster world of data streams and Big Data. The current work focuses on proposing a new incremental recommendation algorithm based on tensor factorization and comparing its results an adaptability to large streams with those of incremental matrix co-factorization algorithms. The aim is to find ideal settings for both approaches, such as number of dimensions, the rank of the chosen variables among others and be able to determine which approach is, indeed, better for what circumstance. Preliminary results show that matrix co-factorization is adequate for higher level user attributes than tensor approaches.

- **15154 | Language used in police interviews in cases of domestic violence**

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Domestic violence (DV), which is intimately connected with the feminine/masculine duality, has long existed and, in Portugal, statistics show a 19,2% rise between 2015 and 2017 (APAV). Gender inequality has established so that women obeying men is seen as only 'natural'. However, as they gained awareness, victims started delating the repressive behaviour of their oppressors. Acts of DV, subsequent actions to delate it and the ensuing police interviews are all expressed through language. Previous research, e.g. Holt & Johnson (2010), unveiled that the questions formulated by the police often reveal inherent linguistic issues, e.g. syntactic complexity. Thus, as the identification of those issues and subsequent suggestions for improvement can contribute to enhancing the procedure, research into interviews with victims of DV is a highly relevant topic for linguistics. This study aims to analyse if the language used in police interviews with victims of DV shows the required features of simplicity, directiveness and impartiality. It focuses on syntax (e.g. embeddings and adverbs of manner) used in the questions asked by enforcement agents in cases of DV, collected in 2017. Our analysis of the questions' formulation corroborates the findings reported by research in English-speaking contexts: as will be shown, questions are overly complex, conservative and subjective. Another problem is the generalization of the cases: all victims must answer the same 20 questions, no matter their origin or the specificities of the event. Also, transcribing oral data is a problem, as during this process data may (inadvertently) be changed, affecting evidence integrity (Haworth, 2010). The presentation concludes with a discussion of the intricacies of the interviewing procedure, and of how the written statement is a result of retelling the same story many times (foregrounding crucial details for the outcome of each case), and points to future directions for forensic linguistic analysis.

- **15156 | Emerging trends in oils consumption: the case of chia, flax and sesame seeds' oils**

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Currently, seeds' oils consumption is trending due to their composition related to healthy effects. They have been used as ingredients in foodstuffs, but restricted to an exclusive market segment. Nevertheless, their chemical characterisation is of utmost importance to understand the beneficial effects.

This work aimed to characterize chia (CO), flax (FO) and sesame (SO) seeds' oils through determining their fatty acids (FA) (GC-FID) (1) and vitamin E (HPLC-DAD-FLD) (2) profiles, as well as, oxidative stability by Rancimat (Model 892 Metrohm) (3). Total phenolic compounds (TPC), antioxidant activity by FRAP and inhibition of DPPH• assay (spectrophotometric methods) (4) were also evaluated.

The major FA determined in CO and FO was α -linolenic acid (~66 and 57%, respectively) whereas SO presented more monounsaturated FA, mainly oleic acid (~43%). In the oxidative stability test, the results were as following: SO (5.8 h) > FO (1.3 h) > CO (1.0 h). Regarding the vitamin E profile, the most biological active vitamer is α -tocopherol, which was only identified in FO and CO. Concerning TPC, SO had the highest content (~13 mg gallic acid equivalents/100 g oil), followed by FO (2.3 mg) and CO (1.3 mg). SO had the highest FRAP value (~215 mg ferrous sulphate equivalents/100 g oil), then FO (~96 mg) and CO (~35 mg). In DPPH• assay, SO had the highest value (~8 mg trolox equivalents/100 g oil), followed by FO (0.2 mg), meaning low antioxidant activities.

Among the three oils analysed, FO and CO presented a similar chemical composition. SO, considering the FA profile, presented the best option to be part of a healthy food pattern.

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- **15157 | Evaluation of the interaction between CdTe quantum dots and malachite green: quantification of food colorants**

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CdTe quantum dots (QDs) are semiconductor nanoparticles, known to possess noteworthy optical properties such as high photoluminescence (PL), quantum yield (QY), long luminescence lifetimes, as well as size-tunable photoemission [1]. In this work, the CdTe QDs were obtained by aqueous synthesis in the laboratory through microwave irradiation, capped and stabilized with thioglycolic acid (TGA). The QDs were characterized recurring to spectrophotometric methods and by direct QY measurements. Afterwards, a Fluorescence Resonance Energy Transfer (FRET) phenomenon between TGA-CdTe QDs and malachite green (MG) was exploited in the development of an analytical methodology for quantification of MG. Malachite green is used as a food colorant, a medical disinfectant, as well as a dye in several kinds of industries [2]. In Europe it is mostly used in aquaculture as a parasiticide, even though it has been reported to cause carcinogenesis, mutagenesis, chromosomal fractures, teratogenicity and respiratory toxicity [2]. Residues of MG and its reduced form have been found in several organs and tissues of living organisms [2]. The quenching effect in the native fluorescence of the QDs, resulting from the interaction between malachite green and CdTe QDs, allowed their use as a fluorescent probe for the quantification of malachite green.

Acknowledgements:

This work received financial support from the European Union (FEDER funds POCI/01/0145/FEDER/007265) and National Funds (FCT/MEC, Fundação para a Ciência e Tecnologia and Ministério da Educação e Ciência) under the Partnership Agreement PT2020 UID/QUI/50006/2013.

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- **15158 | Functional and biochemical responses of *Mytilus galloprovincialis* exposed to suspended sediments under deep-sea conditions**

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The deep sea is the largest ecosystem in the world, it covers 65% of the Earth's surface and is characterized by high pressure, darkness and low temperatures. These facts notwithstanding, it has been reported that the deep sea is impacted by anthropogenic pressures like pollution and fishing. Recently, deep-sea mining has been identified as a potential new cause of disturbance but still, the consequences of deep-sea mining are still a mystery and so understanding how seafloor mining affects its biodiversity is vital to develop guidelines to protect these ecosystems. One of the anticipated effects of deep-sea mining is the creation of sediment plumes. These plumes can potentially be dispersed for several miles and endanger the neighboring environments.

As access to deep-sea species is extremely challenging. Hence, the use of shallow water species like the mussel *Mytilus galloprovincialis* is a good alternative as a proxy to study the effects of suspended sediments. This bivalve species tolerates high pressures and can be used in hyperbaric chamber experiments under deep-sea conditions.

The purpose of this work was to assess the effects of suspended sediments in the model species *M. galloprovincialis*, mimicking deep-sea conditions, as a proxy to clarify the impacts of deep-sea mining in the aquatic environment. So, juveniles of *M. galloprovincialis* were exposed to increasing concentrations of suspended sediments at 1, 4 and 50 Bars. At the end of each experiment, the remaining sediment was collected, feeding assays were performed and catalase, lipid peroxidation and superoxide dismutase were analyzed in the digestive gland.

Our results show that the filtration rate of the mussels exposed to suspended sediments was affected with significant differences between the highest concentration of sediments tested and the control. Significant differences in the biochemical studies were also found for the concentrations tested when compared to the control.

- **15160 | Agro-environmental diagnosis of farms using multicriteria indicators and hierarchical assessment tools.**

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Europe's 2020 Strategy faces the environmental management as a criterion increasingly important for the diverse normative and incentives legislated. It's expectable that political decision-makers and farmers will need to evaluate the type and degree of their activities environmental impact. For this reason, tools are needed to ease and translate these evaluations, capable to clearly define the imbalance factors that deserve action. These tools resort to indicators aggregated in hierarchical evaluation models that should be representative and adaptive. The DIALECTE (Diagnostic Liant Environnement et Contrats Territoriaux d'Exploitation) is a tool that allows to easily diagnose the environmental performance at farm level.

In this study we intend to evaluate the suitability and sensitivity of DIALECTE for the environmental diagnosis of farms in Portugal. The selected farms are distributed into Azores and West Portugal, with two growing strategies: intensive horticulture, and industrially grown vegetable and the data were obtained through field logbooks and participatory analysis. Each indicator, sub-criteria and criteria classification obtained were analyzed and compared for both region and growing techniques. Finally, a sensitivity analysis was performed, introducing alternative practices such: Green Manure; Ecological Compensation and Artificial Pond.

According to the results, the performance of the farms is poor for the generality of criterion, namely the biodiversity-related ones ($\approx 20\%$ out of 100). Farms don't show significant performance differences at the region level, but the opposite is clear comparing growing techniques. The simulations made it possible to observe the indicators' behavior to small changes in the farm management, and the sensitivity of the tool to most of the changes, since farms where alternative practices were introduced, improved their overall classification.

Keywords: agroenvironmental performance; indicators; DIALECTE

- **15164 | Oral sustained release tablets: influence of controlling agent on drug dissolution**

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The aim of this study was to investigate the influence of three types of matrices (25%, w/w), i.e., Protanal® CR 8223 (sodium alginate; hydrophilic), Lubritab® (hydrogenated vegetable oil; lipidic) and Eudragit® RLPO (insoluble copolymer derived from esters of acrylic and methacrylic acid; inert), on the in vitro release profile of vitamin B1 (thiamine hydrochloride) - used as a model of soluble drug - from uncoated tablets.

Tablets, with a target weight of 600 mg, were prepared by direct compression using an alternative compression machine. Three formulations (batches of 200 g) were studied, and the tablets composition was the following: vitamin B1 (2.5%, w/w), Tablettose® 100 (lactose monohydrate; 71.5%, w/w; filler), matrix excipient (25%, w/w; formulations I, II and III contained, respectively, Protanal® CR 8223, Lubritab® and Eudragit® RLPO) and Pruv® (sodium stearyl fumarate; 1%, w/w; anti-adherent lubricant). Weight uniformity, thickness, diameter, hardness and friability of the tablets were evaluated. Additionally, in vitro dissolution studies were performed for 90 minutes, and the vitamin B1 concentration was determined by ultraviolet-visible spectrophotometry at 273 nm. A drug calibration curve was previously prepared, and the determination coefficient (R²) was calculated.

Tablets with suitable physical properties were produced by direct compression. However, the obtained tablets from formulations II and III presented a friability value greater than 1.0%. A drug calibration curve was obtained ($y = 22.5590x - 0.0128$; $R^2 = 0.9994$) and, at 90 minutes, a maximum vitamin B1 release from 63.6 to 107.2% was noticed.

Two main conclusions can be drawn: i) the thiamine hydrochloride dissolution rate was influenced by the controlling agent type in the matrix tablets, i.e., formulations I and II showed a sustained release of the drug, and the formulation III presented an immediate release of the drug; and ii) the formulation I displayed the best results.

- 15165 | "I am a student, a worker and a mother! What do you think about that?": Perceptions about work-family-school balance and the perceived support of the work organization and the university.

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Background: The number of adults who engage in university and need to balance different life roles such as worker, parent and student has increased in the European universities. Recent studies tend to indicate that for female balancing these different roles implies higher role strain and role conflict. But little is known about the family experience and the social perceptions about this balance. The present study explores perceptions regarding (1) work-family-school balance and (2) the role of university and work organization in the balance experience. Method: A sample of adults (N=21) answered an online questionnaire about their perception of this balance. To explore if the experience of a family living this experience reflects the beliefs regarding this population, a couple with two children was interviewed. Qualitative data from interviews and questionnaires was analyzed using content analysis through NVivo 11 (QSR); quantitative data was analyzed using descriptive statistics with SPSS 25 (IBM). Results: The majority of the sample of the questionnaire perceives the balance of these roles in a conflict perspective, considering that it brings negative changes to the family dynamics. The couple perceived the balance in an enrichment perspective and did not feel any changes in the family dynamics. Differences were found in the perception about work organizational support, with the couple evaluating this support as negative and the questionnaire sample as slightly satisfactory. However, any differences were found in the university perceived support. Several strategies to improve this support were suggested. Conclusions: Although the study produced interesting results, the implications to be derived must be cautious given that is an exploratory study. Future studies should be developed with a larger and more diverse sample to understand the relationship between balancing different life roles and the support by work organizations and universities.

- **15166 | Monitoring the nutritional quality of tomatoes during shelf life after a post-harvest treatment with calcium chloride**

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Tomato (*Solanum lycopersicum* L.) is a species with a high economic value and it is one of the most cultivated crops worldwide. The quality and nutritional value of tomatoes are strongly associated with their bioactive compounds, responsible for antioxidant activity and related with many health benefits for its consumers, particularly the reduced risk of developing chronic diseases. To avoid post-harvest damage and decrease of nutritional quality, several treatments may be applied to fresh horticultural crops. This work aimed at the study of the influence of a post-harvest treatment with calcium chloride (CaCl₂) in tomatoes quality after 1 and 2 weeks of storage by evaluation and analysis of various parameters. Effects of CaCl₂ treatments have already been studied in diverse fruits and vegetables, however the consequences of its application in tomatoes are not fully described. The total phenolic content and DPPH scavenging capacity of methanolic extracts obtained from treated tomatoes were evaluated during treatment. The main phenolic compounds were also identified by HPLC-MS to evaluate the impact of CaCl₂ treatment in the phenolic profile of tomato fruits. Glutathione, a molecule with a central role in antioxidant defense system, was also quantified by HPLC-MS. The activity of enzymes involved in synthesis (γ -glutamyl-cysteinyl synthetase and glutamine synthetase) and recycling of glutathione (glutathione reductase) were evaluated in protein extracts of treated tomatoes. Post-harvest treatment with CaCl₂ did not induced any significative effect in total phenolic content and DPPH scavenging activity of tomatoes. However, some alterations of the phenolic profile during treatment were observed, regarding the content of phenolic acids. It was also observed an increase of the activity of Glutamine Synthetase, associated with a decrease in the activity of Glutathione Reductase, responsible for a decrease of the oxidative state of the tomato fruits after treatment.

- **15168 | Beneficial effects of nitric oxide on glyphosate-induced toxicity in *Solanum lycopersicum* L. plants**

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Nadais, Pedro, GreenUPorto - Centro de Investigação em Produção Agroalimentar Sustentável, Departamento de Biologia, Faculdade de Ciências da Universidade do Porto, Portugal
Pereira, Ruth, GreenUPorto - Centro de Investigação em Produção Agroalimentar Sustentável, Departamento de Biologia, Faculdade de Ciências da Universidade do Porto, Portugal
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Due to the population's upsurge, the use of chemicals in agriculture has become essential to maintain plant productivity to meet food needs. Glyphosate (Gly) is the active substance of multiple commercial formulations, being the most applied herbicide worldwide. Since soil contamination by Gly, due to its high application rates, is already affecting non-target plants, the development of new efficient tools to enhance plant tolerance to this agrochemical is a matter of special interest. Thus, in this study, the possible protection role of nitric oxide (NO) against Gly (10 mg kg⁻¹ soil) toxicity in tomato plants (*Solanum lycopersicum* L. cv. Micro-Tom) was evaluated. After 28 days of growth and a weekly foliar spray treatment with NO (200 µM), the plant material was collected and used for biometric endpoints and biochemical parameters (lipid peroxidation – LP; hydrogen peroxide - H₂O₂; proline – Pro and glutathione – GSH). The exposure of tomato plants to Gly resulted in a decrease of root length, followed by a significant reduction of both shoot and root fresh weight. However, the simultaneous exposure to NO and Gly reverted the observed herbicide's phytotoxicity, as evidenced by an increase of all the evaluated parameters, especially of root fresh biomass. Moreover, Gly's phytotoxicity was further confirmed by the estimation of LP, whose levels rose in response to the herbicide. Similar to this behavior, the antioxidant metabolites Pro and GSH were also increased upon exposure to Gly. Regarding H₂O₂, no differences were found between treatments. Once again, the co-treatment with NO reverted Gly negative effects, generally reestablishing the values of LP and antioxidants to those found in the control. Overall, the results of the present study suggest that NO can reduce Gly's phytotoxicity in tomato plants, however, further studies are needed to gain a deeper insight into the biochemical and molecular mechanisms underlying the protective ability of NO against Gly.

- **15169 | Beneficial effects of nano and bulk silicon forms on glyphosate-induced oxidative stress in tomato plants**

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Nowadays, agriculture is becoming more dependent on the use of chemicals to control weeds. Glyphosate (Gly), the most widely used herbicide, has been the target of many scientific studies concerning its toxicity to non-target organisms. Indeed, since in the last few years, serious concerns about its safety have been reported, there is an interest of the scientific community to find new strategies to enhance plant tolerance to Gly. In this study, the role of silicon (Si), in both nano (SiO₂ nanomaterial) and bulk (Na₂SiO₃) forms, on the tolerance of tomato plants under Gly stress was evaluated. For this purpose, tomato plants (*Solanum lycopersicum* L. cv. Micro-Tom) were exposed for 28 days to Gly (10 mg kg⁻¹ soil) and weekly pulverized with bulk Si (1 mM) and nano-SiO₂ (1 mM). After 28 days of growth, plant material was collected and used for biometrical and biochemical parameters. The exposure of tomato plants to Gly resulted in a great decrease of both root and shoot biomass, as well in the root length, followed by an increase in lipid peroxidation (LP), proline (Pro) and hydrogen peroxide (H₂O₂) levels in shoots. However, the plant spraying with both Si and nano-SiO₂ resulted in the mitigation of the negative effect of Gly, as evidenced by the recovery of the biometric parameters. Moreover, upon co-treatment with Si (bulk and nano forms), LP degree and Pro levels were reduced to those of control situation. Altogether, our results suggested that Si, in both bulk and nano forms, can mitigate the phytotoxicity of Gly, though future studies are needed to concretely unravel the stress tolerance mechanisms activated by Si.

- **15172 | Disinfection of Alginate Impressions – demystifying paradigms among oral healthcare professionals.**

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Purpose: Alginate is a commonly used impression material in dental appointments. Therefore disinfection procedures should be routinely performed to reduce the risk of cross infection among dental practitioners (DP), assistants and prosthesis technicians (PT). The objectives of this investigation were to evaluate the infection control knowledge and practices regarding alginate impressions, as well as to assess the antimicrobial effectiveness and the impact on the dimensional stability of alginate impressions of water wash and some of the most clinically used disinfection solutions.

Methods: The infection control practices and knowledge were evaluated by a national survey sent by e-mail to 1000 DP and 320 PT. Dental impressions were taken on 16 volunteer students and the antimicrobial effectiveness of each procedure was evaluated by pour plate method. The dimensional stability was evaluated using a standardized stainless steel model, according to ANSI/ADA nº18 specification.

Results: Only 57.4% of DP always disinfect the dental impression in every situation and 25% of the DP don't disinfect the impressions for fearing dimensional changes of their impressions. Water washing alginate impressions does not reduce the microbial load significantly. Disinfection by immersion with 3% hydrogen peroxide, MD520® (DurrTM), or sodium hypochlorite at 1% and 5.25% does not modify significantly the dimensional stability and reduces up to 99.9% of the microbial load of the impression.

Conclusion: All disinfectants tested showed high antimicrobial efficiency without significant changes in three-dimensional shape of alginate dental impressions, whereas water washing is not efficient to reduce the microbial load. It is necessary to reinforce, among oral healthcare professionals, that disinfection is crucial and does not significantly affect the three-dimensional shape of dental impressions.

- **15179 | SALUTEM: A web-based tool for automated feedback and assessment of iSBAR**

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Several reports indicate that communication between healthcare professionals have serious gaps, which may lead to inadequate treatment and jeopardize patient safety. It is estimated that 70% of the adverse events in healthcare are caused by non-effective communication. To minimize the occurrence of communication errors, several techniques to uniformize the communication process between physicians are currently available. iSBAR (Identification, Situation, Background, Assessment, Recommendation) is a standard communication protocol between healthcare professionals, usually applied in patient handovers, but applicable in all situations where a structured communication is needed. In 2017, Direção Geral de Saúde released a specific norm advising healthcare institutions to give specific training to their professionals on the use and application of this protocol. Despite this effort, iSBAR is not used regularly and, when used, is not well applied. To promote the correct use and stimulate the training of iSBAR, an automated feedback and assessment system is proposed. This system uses natural language processing techniques, such as automatic speech recognition and natural language understanding. It records phone calls, which are transcribed using a speech-to-text algorithm. The text is further processed with high and low pass filters and an automated feedback of specific parameters is generated and provided to the user. Preliminary tests with state-of-art speech-to-text frameworks and different audio processing filters reveal promising results regarding word hit rates on transcription. The system is being designed as a web application, allowing the users to record calls/conversations and receive instantaneous feedback on their performance. With this system, users also have access to their progress. The automated feedback algorithms are still being refined, using natural language understanding techniques.

- **15180 | Non-steroidal aromatase inhibitors for hormone-dependent breast cancer: a virtual screening approach**

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Introduction: Estrogen receptor positive breast cancer (ER+) is the leading form of cancer death in women worldwide. Estrogens, which are synthesized by the enzyme aromatase, are implicated on growth of this type of cancers, being their action mediated by ER (1). In these type of cancers, aromatase and ER α are up-regulated to promote growth, while ER β is down-regulated due to its anti-proliferative effects, being therefore considered attractive therapeutic targets. Besides the clinical success of the current first-line treatments, the occurrence of resistance to these therapies (2), highlights the need to discover novel drugs that may improve cancer treatment. Considering this, our goal is to increase our knowledge on the chemical evolution of the drugs that interact with these targets and understand their specificity. In order to improve the multi-target affinity, a pharmacophore model will be designed.

Methods: We used the ChEMBL Database to retrieve all the active compounds that inhibit receptors and aromatase functions. Using the ChemAxon software we computed two types of chemical descriptors: extended connectivity fingerprints and the pharmacophore fingerprints of each compound. The compounds were then hierarchical clustered. In parallel, the biological activity of the best compounds was selected to determine a 3D QSAR model using the open 3D-QSAR software.

Conclusions: For the best of our knowledge, this is the first multi-target approach that aims to discover new non-steroidal compounds that simultaneously inhibit aromatase and modulate the actions of ERs. In this context, we have identified the selectivity and promiscuity of the targets and performed a virtual screening, to further study the in vitro effects of the compounds on breast cancer cell models.

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- **15181 | Binge Drinking in university students**

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This qualitative research aims to explore binge drinking in university students, focusing specifically in their perception of this construct, the influences and motivations important to this practice, as well as its consequences. 39 online questionnaires and 3 semi-structured interviews were applied. Qualitative data was analyzed using content analysis with the support of NVivo11[®], quantitative data was analyzed using SPSS 24. The results show that most of the two samples are unaware of the concept of binge drinking, although they relate it to exaggerated alcohol consumption. It was also clear that the college context, and all that it encompasses, has a substantial influence in this practice, as well as peers, which are recurrently mentioned, and the freedom experienced upon entering college. The most mentioned consequences by the participants are in the health and the social domains. Even though students recognize the effects of alcohol, their consequences, as well as the reasons and expectations that lead to drink excessively, few try to avoid these behaviors, viewing binge drinking as a behavior that is expected and that is a part of the academic experience, normalizing thusly the phenomenon in society.

Key Words: binge drinking; alcohol; college; peers

- **15182 | Competition Sport Nutrition: How to Change Behaviors? A Study Conducted in a Female Volleyball Team**

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Aligned with individual health, athletes' performance is influenced by food, and their diet should be adapted to corresponding performance goals. An intervention focused on food education may help change behaviours, leading to a healthier lifestyle.

Based on this premise, this study was conducted at a Portuguese federated volleyball club and aimed to characterize the dietary habits of a team of 12 female senior athletes and to analyse which factors are considered as potentiators, or inhibitors, to change these eating behaviours.

Framed on Transtheoretical Model, this study adopted a research design in three moments (diagnosis, implementation of an intervention program and evaluation after intervention) based on quantitative (questionnaire) and qualitative (focus group) instruments. The option of a mixed methodological approach allowed a relational and informed dynamic between the discourses of the athletes in the focus groups and a perspective of validation in the questionnaire response.

Considering the 12 participants and their stages of change, we could observe an evolution from diagnosis to after intervention. Considering the stages of the Transtheoretical Model, the initial stage of Precontemplation remained unchanged. In the second stage, Contemplation, two athletes evolved to more advanced stages. At the Preparation stage, from a total of seven athletes at diagnosis, five evolved and, after intervention, only two athletes were at this stage. At the stage of Action we could see a significant increase of athletes which indicates that many evolved to this stage, from one athlete at diagnosis to nine athletes after intervention. At the stage of Maintenance, one athlete stayed at this stage and another one regressed after intervention.

These results indicate that an intervention based on the introduction of a nutritional program, led these athletes to more advanced stages of change and, consequently to adopt a more conscious and balanced set of eating strategies.

- **15186 | Within a hierarchy of atmospheres: Lorenteggio's New Library**

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The architectural role is not only restricted to the simplicity of an answer linked to necessity and time, but to dimensions and proportions, through the relation between knowledge and practice, that are constantly and temporally related to transformations that has, as a crucial tool, the way the body lives, modulates and regulates space.

The present research intends to focus on the understanding of how the body negotiates and impacts space with the approach and study of a specific study case - a competition entry for a new library in Lorenteggio, Milano.

The contrast present in spectator vs user or architect vs individual will be deeply studied through an experimental approach, an internship and competition in Italy, which provided and allowed an exchange of new and different perspectives and forms of knowledge. A reflection on how the potentiality of the different meanings, interpretations and values interfere in the architectural process and how the Human, architect or individual, explores the space and objects that are inherent to him.

The building, presenting itself as a hierarchy of atmospheres in constant metamorphosis and dynamism, is revealed as a landscape in continuous evolution. This line of thought contributes to a perception of how exterior conditions to the body are related or conditioned by it; and it is in this dialogue between body and surroundings, flexibility and fluidity that is founded the heart of this New Library.

This investigation is presented in the development and evolution of a master thesis on Master's Degree in Architecture, at FAUP, 2017/18, under the supervision of Helder Casal Ribeiro.

- **15188 | Págos, Anatome**

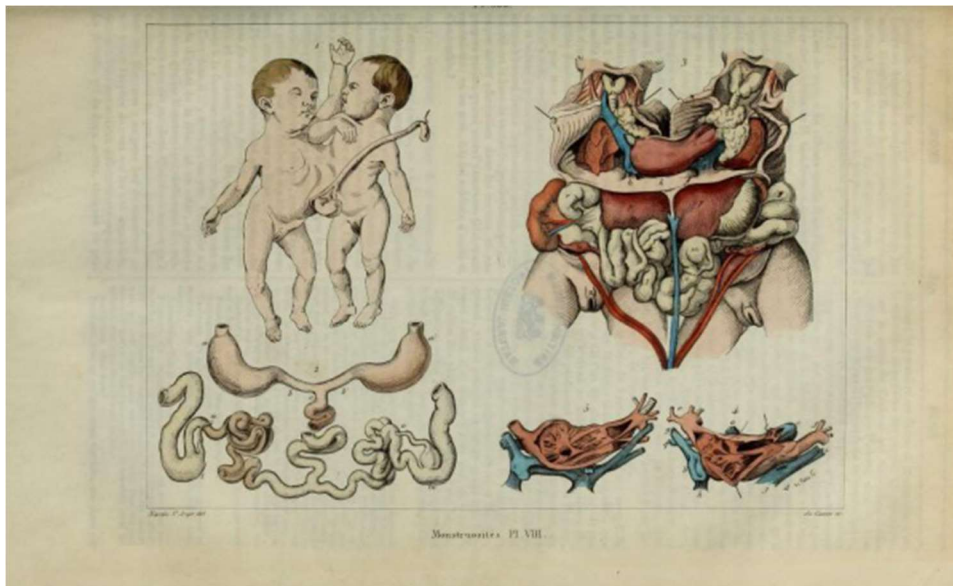
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Keywords: human dissection, anatomy, xiphopagus, scientific illustration

This paper presents an iconographic study on the xiphopagic aesthetic, with focus on the role of scientific illustration in the representation of the human dissection of conjoined twins. Medical illustration has the aim to convey precise scientific information, to serve as an example to elucidate, explain and highlight a specific topic. Therefore, it can be understood that its iconographic value and pertinence is undeniable for, this specific branch of art history intends to identify, describe and interpret the meaning of the images. In order to understand more fully the core of the present inquiry, the definitions and explanations of anatomy and dissection are given. Hence, the path to a proper approach to xiphopagic dissection is traced and thus, full analysis of the images presented, possible.

It is understood that this is a theme which exerts both fascination and disgust. The resources are scarce, if not rare. The xiphopagic aesthetic as a subtheme of human dissection deals with what is often unimaginable, purposefully hidden. This is a topic that lacks a proper study of its imagery, especially in art history, let alone with a teratological focus instead of its readily and usual monstrous interpretations. Its importance lies in studying not only that which is readily palatable and within the scope of the understood beautiful, aesthetically attractive.

Throughout, this paper showcases the evolution of the different methods of visual representation in xiphopagus dissection. The imagery surely deals with the mortal and carnal aspects of the body as flesh, tissue, blood and organs. These vital elements, often avoided, are exposed through art. To conclude, the interdisciplinary scope of this research passes through areas of knowledge such as aesthetics, art, history, science and medicine; but it also deals with a much more humane understanding and acceptance of that which is different.



Dictionnaire pittoresque d'histoire naturelle et des phénomènes de la nature

- **15194 | Returning home: a qualitative study on Post-Erasmus Syndrome**

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The present study explores the emotions and the difficulties experienced by students who participated in the Erasmus+ program after their return from the mobility period. The proposed research questions were: (1) which emotions do students experience in the first few months after their return from the mobility period; (2) which are the difficulties encountered by students in the first few months after their return home; and (3) which are the students' perceptions about the impact of the mobility period on their personal development. The sample consisted of 32 participants, of whom 2 answered a semi-structured interview (both female) and 30 answered an online questionnaire (23 female and 7 male). All participants attended a Portuguese higher education institution during the mobility period and had to have completed the mobility on the last three years. Data was gathered using a semi-structured interview and an online questionnaire. Qualitative data was analysed using thematic content analysis with the support of NVivo11®; quantitative data was subject to descriptive statistics using SPSS. Results suggest that there are negative and positive emotions associated to the return from the mobility period. The most experienced positive emotions were "Happiness," "Relief," and "Gratitude." On the other hand, the most recurring negative emotions were "Saudade", "Nostalgia" and "Sadness". The difficulties most encountered by returning students relate to the readaptation to the routine and the context and the feeling of lack of freedom. Participants also revealed that the mobility period had a positive influence on their ability to adapt to new situations, the willingness to communicate with new people and their independence. Most of the participants consider to have experienced personal development.

Keywords: Erasmus+ Program; mobility; emotions; difficulties; reverse culture shock; personal development.

- **15195 | Gender Equality in the video games sector in Portugal**

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The video game industry is currently one of the fastest growing sectors in the world. Video games are no longer a secondary activity and have established as part of the contemporary social culture. The relevance of this sector is not limited to economic dimension but also produces sociocultural effects. In this condition, one can say that video games can be observed as a means to reflect upon gender equality. The sexualization of the characters present in a large part of the videogames has the consequence of creating stereotypes that reflect the social construction of the genre. Moreover, for many years the gaming industry disregarded the female gamer, reinforcing the claim that girls and women were not interested in electronic games. In fact, video games reaffirm or rewrite dominant and patriarchal conceptions of gender roles. There is no broad study in Portugal on the gender dimension and digital games, which hampers effective actions aimed at eliminating gender asymmetries, both in terms of girls' access to this training context and in gender stereotypes in games and video games produced in the country. In order to investigate how gender is represented in video games produced in Portugal, we are carrying out a scientific investigation that includes the following phases: 1. Identification of how the female and male characters are represented in the games and video games produced in Portugal in the last 10 years (2008-2018); 2. Realization of focus group with students of the courses of games in Portuguese institutions; 3. Conducting interviews with teachers of the courses of games and professionals who work in the production of digital video games in Portugal. The data collected are in the process of being analyzed but it is possible to conclude that it is urgent to introduce the discussion on gender equality in video game degree courses.

- **15196 | Effects of BPA and simvastatin on epigenetic machinery in *Gammarus locusta***

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Water is one of the crucial needs for life. Several legal instruments are being developed to protect this resource, but the efforts to improve chemicals removal are still limited for some compounds. Thus, chemicals at levels that may impact sensitive taxa continue reaching the aquatic environment. Epigenetic effects of environmental contaminants have been a topic increasingly studied in (eco)toxicological research due to its importance including for the evaluation of chemicals toxicity and associated diseases. Bisphenol A (BPA) is an endocrine disruptor used in manufacture of diverse products. Previous studies show BPA ability to cross placenta, cause infertility and affects transcription of steroidogenic genes in mammalian models. Concerning epigenetic effects, global DNA hypermethylation and histone deacetylation were observed for BPA in a limit number of studies. Simvastatin is one of the most prescribed pharmaceuticals used to lower hypercholesterolemia. Several studies have indicate that statins increase histone acetylation in mammalian models and a recent study with chronic kidney disease patients shows that simvastatin administration increases DNA methylation. The aim of this study was to address the effects of BPA and simvastatin as potential modulators of epigenetic regulation in the amphipod *Gammarus locusta*. As a proxy for future studies, the baseline levels of expression of genes encoding proteins such as DNA methyltransferase-1, eukaryotic translation factor-2, E3 ubiquitin-protein ligase-1, actin-5C, 60S ribosomal protein-L13 and enhancer of zeste homolog-2 was performed in *G. locusta* exposed to environmentally relevant concentrations of these compounds. Results show significant changes in transcription of some target genes in comparison with control treatment. This study provides additional insights into the epigenetic effects of BPA and simvastatin in invertebrates.

- **15197 | The Migration of Images: From King David Musician to Saint John Coltrane**

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Abstract: The image of David, the musician, made a great journey through the ages. Its representation can be found from the mosaics and murals of the Byzantine world, passing through psalteries and medieval illuminations until arriving later to the lithograph of the German Otto Dix in the 20th century. All over this trajectory, the image of King David, the composer of the psalms, representative of the sacred music itself, stands out. Thus, this paper proposes to discuss the formal connections and thematic content established between this iconography and the image of Saint John Coltrane, also a musician and composer of psalms, painted by the American artist Mark Dukes to the Saint John Will-I-Am Coltrane African Orthodoxy Church.

Keywords: King David; sacred music; psalm; John Coltrane; jazz; resistance; spirituality

- **15198 | The application of click chemistry in the synthesis of new potential antifouling chalcones**

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Chalcones are a group of natural products well known for their extensive biological activities, such as antioxidant, anti-inflammatory, anticancer, anti-aging, cardioprotective, among others [1]. Very recently, our group studied for the first time the antifouling activity of 16 synthesized chalcones at different levels of biological organization using both anti-macrofouling and anti-microfouling bioassays, namely an anti-settlement assay using mussel larvae, as well as marine bacteria and microalgae biofilms growth inhibition bioassays [2]. Following the promising results obtained, the synthesis of new chalcone derivatives with a triazole moiety was planned in this work. The triazole was associated with anticorrosive effects and we reasoned that the planned triazole chalcone hybrids could exhibit both anticorrosive and antifouling properties. Firstly, appropriately substituted acetophenone was propargylated in order to synthesize the precursor chalcones through Claisen-Schmidt condensation. Afterwards, some triazole linked chalcones were synthesized by copper-catalysed alkyne-azide cycloaddition using different azides. The structure elucidation of synthesized compounds was established on the basis of NMR techniques. The evaluation of the antifouling activity is on-going.

#Authors contributed equally to this work.

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Acknowledgments:

This research was partially supported by the Strategic Funding UID/Multi/04423/2013 through national funds provided by FCT - Foundation for Science and Technology and European Regional Development Fund (ERDF), in the framework of the programme PT2020, the projects PTDC/MAR-BIO/4694/2014 (POCI-01-0145-FEDER-016790; Project 3599-PPCDT), PTDC/AAGTEC/0739/2014 (POCI-01-0145-FEDER-016793; Project 9471-PPCDT) and POCI-01-0145-FEDER-028736.

- **15201 | DNA methylation as a tool for lung cancer subtyping in liquid biopsies**

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Background: Lung cancer (LCA) is the most diagnosed and deadly cancer worldwide. Most of LCA cases are diagnosed at an advanced stage and its prognosis and treatment are highly associated with LCA subtypes. Tissue biopsy and/or cytology are the gold-standard methods used in LCA subtyping. However, these procedures are invasive and frequently the material obtained is not sufficient for a differential diagnosis. Aberrant DNA methylation is an early event in cancer development and a valuable biomarker since it can be detected in circulating cell-free DNA (ccfDNA). Thus, we aimed to evaluate the methylation levels of selected genes in tissue and ccfDNA LCA samples for LCA subtyping and prognosis assessment.

Methods: Methylation levels of APC, HOXA9, RAR β 2 and RASSF1A were assessed in a cohort composed by 131 LCA plasma samples by quantitative methylation-specific PCR (qMSP). Associations between genes methylation levels and LCA subtypes were evaluated. ROC curves and survival analysis were performed.

Results: HOXA9 and RASSF1A displayed higher methylation levels in small-cell lung cancer (SCLC) in comparison with non-small cell lung cancer (NSCLC). HOXA9 displayed 68% sensitivity and RASSF1A 96% specificity for SCLC detection in ccfDNA liquid biopsies. Furthermore, patients with higher HOXA9methylation levels presented poorer outcome in univariate survival analysis.

Conclusions: Methylation levels' assessment in ccfDNA may constitute a minimally-invasive procedure for LCA subtyping, avoiding expensive and invasive procedures.

- **15206 | Impact of lactate exposure in renal cell carcinoma aggressiveness: role of sirtuin's modulation**

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Background: Renal cell carcinoma (RCC) displays glycolytic phenotype (Warburg effect). Increased lactate production, impacting on tumor biology and microenvironment modulation, has been recently shown to modulate epigenetic mechanisms, leading to histone deacetylases inhibition. Thus, in-depth knowledge of lactate's role in epigenome regulation of highly glycolytic tumors might entail new therapeutic strategies. Herein, we investigated the interaction between metabolism and epigenetics in RCC.

Methods: Lactate's effect on epigenetic enzymes was evaluated in normal kidney (HKC-8 and HK-2) and RCC (769-P, Caki-1, Caki-2 and ACHN) cell lines, assessing cell growth, proliferation, migration, and invasion. *In vitro* effects of nicotinamide [NAM, sirtuins (SIRT) inhibitor] and alpha-cyano-4-hydroxycinnamate [CHC, monocarboxylate transporters (MCT) inhibitor] on cell phenotype were also evaluated. Finally, HIF-1alpha, SIRT1 and SIRT6 immunoexpression was assessed in human RCC and normal renal tissues.

Results: Lactate inhibited SIRT in RCC cells. SIRT1, SIRT3 and SIRT6 downregulation induced histone H3 and H4 hyperacetylation, with increased H3K9 and H4K16 acetylation. Cells exposed to lactate displayed pronounced glycolytic phenotype through upregulation of HIF-1alpha and MCTs, disclosing increased cell migration and invasion. Furthermore, lactate exposure induced similar alterations in normal kidney cell lines, acquiring some malignant-like features (pseudo-transformation). NAM treatment paralleled lactate effects, promoting cell aggressiveness. In contrast, CHC reversed them by blocking lactate transport. Primary RCC disclosed HIF-1alpha upregulation whereas SIRT1 and SIRT6 were downregulated compared to normal tissues.

Conclusions: In RCC, lactate enhances tumor cell aggressiveness and modulates normal cell phenotype, through downregulation of SIRTs, unveiling tumor metabolism as a promising therapeutic target in RCC.

- 15208 | Role of JmjC-KDMs in HIF-1alpha-dependent modulation: Effect on esophageal squamous cell carcinoma radioresistance

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Introduction: Esophageal cancer is the seventh most common cancer and the sixth leading cause of death worldwide. Despite the advances in radiotherapy (RT), the esophageal cancer prognosis remains poor. Hypoxic foci are known to endure resistance to RT in several solid tumors. At a molecular level, the hypoxic microenvironment is characterized by increased transcription and activation of HIF-1alpha, whereas the interaction with epigenetic machinery is not fully understood. Hence, our aim was to tackle the association between Jumonji domain lysine specific demethylases (JmjC-KDMs) and HIF-1alpha-dependent modulation. Additionally, we investigated whether those epigenetic changes may be used as predictive markers for esophageal squamous cell carcinoma (ESCC) response to RT.

Materials and Methods: ESCC cell lines were irradiated with ionizing radiation in the presence of 50 µM CoCl₂ and the effects on cell survival were evaluated by colony formation assay. The expression of KDM3A, KDM6B, KDM4C and HIF-1alpha were assessed at transcriptional and protein levels after CoCl₂ addition. Subsequently, several functional assays were performed after drug treatment with a specific JmjC-KDMs inhibitor (IOX1) coupled with RT response evaluation.

Results and Discussion: Increased HIF-1alpha expression was observed in CoCl₂ exposed cells compared to basal conditions. Moreover, significantly increased transcriptional and protein levels of histone demethylases (KDMs-erasers) were depicted for all studied cell lines. Conversely, decreased H3K9me₃ and H3K27me₃ expression was observed in the same cells. Conversely, KDMs activity inhibition led to a significant alteration in aggressiveness parameters involving DNA repair, apoptosis and cell migration. In agreement, the radiosensitivity of IOX1 treated cells increased.

Conclusion: Our results suggest that the studied JmjC-KDMs may be predictive biomarkers of RT response and might be candidates for target therapies in ESCC.

- **15209 | Non-typhoidal Salmonella serotypes adapted to diverse stresses in a poultry meat processing unit in Portugal**

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Salmonella causes frequently foodborne infections mainly associated with eggs/poultry products. A decreasing trend in human salmonellosis, particularly of *S. Enteritidis*, has been observed in EU due to successful control programs at the avian production level. However, the effectiveness of control practices on the elimination of Salmonella, and particularly of EU targeted serotypes, in poultry has been scarcely explored. Here, we investigated the presence of Salmonella, and their clinically-relevant serotypes, among fresh chicken-meat samples at poultry processing level in Portugal. Pooled chicken-meat samples (n=53; each sample=25g of neck skin from 10 carcasses; 29 producers) were collected in 2018 (spring/summer). Samples were processed following ISO-6579-1:2017 cultural standard and a molecular approach (PCR-*invA* gene) applied directly in the pre-enrichment/enrichments broths. Search of EU targeted serotypes (*Enteritidis*/*Typhimurium*/4,5,12:i:-) and their antibiotic/metal resistance markers were performed by PCR. Ability to survive/grow at acidic pH (2-6.5) was evaluated by broth-microdilution. Salmonella was detected in two samples of fresh chicken-meat (4%) from different poultry-farms in both seasons, by cultural and molecular approaches. The isolates belonged to a non-H₂S-producing serotype *S. 4,5,12:i:-* (n=6 isolates/spring sample), with the typical antibiotic/metal resistance genotypic features of clones currently circulating in Europe, or *S. Enteritidis* (n=3 isolates/summer sample). All isolates grew at minimal pH=4 and survived until pH=3.5. A low occurrence of Salmonella in chicken carcasses was observed, although with detection of two serotypes of public health significance with ability to grow under diverse stresses. Our results alert for the need to evaluate current biosafety measures to prevent the spread of these pathogens in the poultry production through the final consumer.

This work was supported by project: PP-IJUP2017-SOJA DE PORTUGAL-27.

- **15210 | Performance of circulating miR-182-5p and miR-375-3p in prostate cancer screening and prediction of metastatic disease**

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Prostate cancer (PCa) is one of most common cancers in men worldwide. Although PSA screening has facilitated the detection of PCa at early stages, the limited sensitivity and specificity of current methods for PCa detection and prognosis constitutes a major problem in clinical practice. Hence, development and validation of new molecular biomarkers is crucial. MicroRNAs (miRNA) deregulation is common in cancer, constituting potential non-invasive biomarkers for PCa detection and prognostication. We aimed to explore the expression of two plasma-circulating miRNAs (miR-182-5p and miR-375-3p) in liquid biopsies of PCa patients with clinically localized disease undergoing curative-intent treatment as screening and prognostic biomarkers.

Plasma samples from 252 PCa patients diagnosed and treated at IPO-Porto and 52 asymptomatic controls were collected after informed consent. After RNA extraction from plasma samples, specific miRNAs cDNA synthesis was performed followed by measurement of miR-182-5p and miR-375-3p relative expression by RT-qPCR, using U6 snRNA gene as reference.

MiR-182-5p was significantly overexpressed in plasma of PCa patients compared to controls ($p=0.0020$), being able to identify PCa with 77% specificity and 99% NPV (AUC=0.64, CI95%: 0.561-0.709, $p=0.0021$). Moreover, higher circulating levels of both miR-182-5p and miR-375-3p associated with advanced pathologic stages. Interestingly, at the time of diagnosis, circulating levels of miR-375-3p was significantly higher in patients that developed metastasis during follow-up ($p=0.0145$), identifying patients more prone to develop metastatic disease with 50% sensitivity, 76% specificity and NPV of 89% (AUC=0.62, CI95%: 0.529-0.713, $p=0.0149$).

We conclude that these two circulating miRNAs might be clinically useful biomarkers for non-invasive detection and prediction of metastasis development, improving patient management and reducing healthcare costs.

- **15212 | De Campanis Fundentis - A Bell Foundry Factory in Rio Tinto, Portugal.**

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Hidden in the towering tops of their domains and almost consigned to oblivion, bells can provide essential data for the mapping and understanding of a multitude of aspects of human life - they are their own primary sources. Historians can study and analyse their artistry, design techniques and the melodies they produce, as well as the architectural traits of the buildings they are a part of. Additionally, they are a path to the study of the life experiences, beliefs and superstitions of the communities they sang for. Although frequently associated with religious contexts, bells were also used in several other circumstances, always associated with prophylactic and apotropaic properties.

The traditional production process must follow a rigorous set of rules and, unfortunately, only a very small number of factories still execute it. The Rio Tinto Bell Factory (Borough of Gondomar, in Porto) founded in 1899 and closed in 2012, managed to preserve a significant part of the traditional environment and implements of a smelting factory. Due to the state of the roof of the building, which seems to be about to fall, we understand that it is urgent to raise awareness as well as preserve this place in order to understand its technical production specifications relative to this industry in the city of Braga, the only one in Portugal with active production.

Owing to all of the above, we believe that bells have been significantly underexplored in art history - the small number of papers on the theme, added to the increasing automation of bell ringing systems, which translates into the loss of traditional bell melodies and tunes, make this research increasingly relevant and pertinent.

With this paper, developed within the scope of our master's thesis, we wish to explore different methods of analysis using primary sources (such as implements and documents from the factory) as the starting point in order to create timelines and to discover the history of this factory and its bells.



Fábrica de Fundição de Sinos de Rio Tinto | Rua Dr. Guilherme Cirne, 122, Rio Tinto, 2018.

- **15215 | Enantioselective method for quantification of chiral drugs in environmental matrices in Douro river estuary by LC-MS/MS**

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Chiral drugs (CDs) have been targeted as an environmental concern due to their different forms occurring in the environment. CDs can be detected in the environment with different values of enantiomeric fraction (EF) [1]. Consequently, it's important to determine the EF of these compounds in environmental for an accurate risk assessment [2]. This work presents the development of an enantioselective method to quantify CDs in surface water. Different classes of CDs, such as beta-blockers, antidepressants, stimulants, non-steroidal anti-inflammatory drugs and illegal drugs were selected. The analytical method was based on solid phase extraction followed by LC-MS/MS. The enantioseparations were performed using two chiral columns. Samples collected in Douro river estuary were analysed. Nine compounds were found every day, including illicit drugs.

This research was partially supported by the Strategic Funding UID/Multi/04423/2013 through national funds provided by FCT - Foundation for Science and Technology and European Regional Development Fund (ERDF), in the framework of the programme PT2020; POCI-01-0145-FEDER-006984 - Associate Laboratory LSRE-LCM funded by ERDF through COMPETE2020-Programa Operacional Competitividade e Internacionalização (Project POCI-01-0145-FEDER-030521) and by national funds (PIDDAC) through FCT/MCTES;CHIRALDRUGS-CESPU-2017 and BIOENVIRON-CESPU-2018.FCT grants (Ref. SFRH/BPD/101703/2014 and Ref. PD/BD/137738/2018, for ARR and JCGS, respectively).

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- 15216 | *Trioza erytreae* (African citrus psyllidae): (i) life cycle; (ii) observation of the damage caused to citrus trees and their evolution over time

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The African citrus psyllidae, *Trioza erytreae* (Del Guercio) (Hemiptera, Triozidae), was first spotted in Portugal on the island of Madeira in 1994, and later in the Porto city in December 2014, and it is currently still in dispersion in the country. Although the main concern of this pest is that it is a potential vector of the phloem-limited bacteria *Candidatus liberibacter* spp., causal agent of huanglongbing also called greening, which is included in the list A1 of the EPPO, the direct damage caused by this pest justifies attention to this pest, even in the absence of the bacteria. Thus, the objectives of this study were: (i) to know the biology and damage of the African psyllid and analyze the evolution of the damages on the tree; (ii) to know the distribution of the African psyllid on the tree. The study was conducted at Vairão Campus (Vila do Conde). A description of the psyllid is made in the various stages of development and damage in citrus trees, contributing, among other things, to knowledge dissemination and better risk assessment. In order to know the distribution (on the tree), observations were made in circles with a diameter of 56cm in 39 lemon's trees and the results showed that the number of flushes was greater in south and west, followed by east and lastly north quadrant (Tukey test for multiple comparison for orders with $\alpha=0,05$). The proportion of flushes attacked by the psyllid was not significantly different for the four quadrants ($\alpha=0,05$), and was in average $0,92 \pm 0,03$ a very high value expressing the intensity of pest attack.

- **15218 | Intestinal colonization with multidrug-resistant, ESBL or carbapenemase producing Enterobacteriaceae, in continuing-care facilities in the Northern region of Portugal**

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Population aging creates a greater need for medium and long-term care facilities, as those of the national Integrated Continuing Care Units (ICCU). Thus, emerges a significant problem with the appearance of multidrug-resistant microorganisms (MDR), especially Gram-negative, as *Escherichia coli* (*E. coli*) and *Klebsiella pneumoniae* (*K. pneumoniae*). The work's objective is to detect and characterize multi-resistant Gram-negative bacilli, as intestinal colonizers, in ICCU patients, particularly extended spectrum β -lactamase (ESBL) and carbapenemase producing Enterobacteriaceae.

Forty-four samples of patients of 3 ICCU of the North of Portugal, districts of Bragança (23), Porto (11) and Braga (6), were analyzed. Antibiotic susceptibility test was performed according to the European Committee on Antimicrobial Susceptibility Testing specifications. ESBL producers were confirmed by addition of clavulanic acid to cefotaxime disks, in the diffusion method test and carbapenemase production was confirmed by Blue-carba, test Modified Hogde and Carbapenem Inactivation Method. ESBL and carbapenemases were characterized by polymerase chain reaction. KPC expressing gene was sequenced.

Thirty-five relevant intestinal isolates were identified in the 3 ICCUs: 30 ESBL (15 *E. coli*; 12 *K. pneumoniae*; 3 *Proteus* spp) and 5 carbapenemase producers (all *K. pneumoniae*). Most patients have co-colonization. Molecular characterization showed KPC-2 type and CTX-M-group 1, particularly CTX-M-15.

Intestinal colonization by ESBL and carbapenemase producers, in ICCU patients is already a reality in Portuguese health-care setting. We can deduce that these units are effective reservoirs in the spread of MDR bacteria and genes associated with antibiotic resistance. As it is suggested, intestinal colonization and spread of bacteria with acquired multidrug-resistance is a reality and is a major priority that population and health units take serious infection control measures and use antibiotics rationally.

- **15220 | Pericardial fluid: from biochemical screening to therapeutic potential in ischemic heart disease**

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Ischemic heart disease is the leading cause of death worldwide, being responsible for almost 9 million deaths annually. Among ischemic heart diseases, myocardial infarction (MI) is the major cause of morbidity and mortality. The pericardial fluid (PF), the lubricant that surrounds the heart, has been recently suggested as a potential source of targets to promote regeneration or more efficient repair of the infarcted heart, however, studies addressing molecular alterations in the PF in specific disease scenarios are lacking.

We hypothesize that PF after MI concentrates signals that modulate cardiac fibrosis. As such, we aim to characterize the fibrogenic potential of the PF after MI and identify putative mediators of this process.

Blood and PF were collected from two patient cohorts, namely a control group with stable coronary artery disease (without previous MI) and a MI group with a recent first MI (<3 months). IL-1R4 levels were assessed by ELISA and miRNAs (miR) quantified by RT-PCR. Extracellular vesicles (EVs) were isolated by ultracentrifugation and characterized by TEM, NTA and WB. PF was subject to Ion Torrent Next generation sequencing.

Cardiac fibrosis mediators, namely IL-1R4 and miR-21, were more abundant in the PF of MI patients, compared of control patients and plasma. As miRNA are commonly associated with EVs in biological fluids, we assessed their presence in PF. EVs were efficiently isolated from the PF as shown by TEM and detection of endolysosomal markers. According to NTA, EVs have a size ranging from 10-500 nm, with a prevalence of EVs with sizes of ~100 nm and 200-300 nm. No differences were detected in the quantity of EVs across patient groups or biological sources.

These results advocate PF mediates cardiac fibrosis upon MI, namely through miRs. NGS will assist the selection of specific pro-fibrotic miRs for further in vitro validation and mechanistic dissection.

- **15221 | Corporate Museums in Portugal. Esteem the past as a future defense**

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The paper elects as object of study the Corporate Museum. About this hybrid entity that gathers together two apparently opposing institutions, the company and the museum, this study seeks to trace his historical course and formation, elucidating it in terms of some national specificities and their multiple possibilities of constitution and existence. Having identified the elements that allow to formulate a consistent definition for the Corporate Museum as a museological unit, the main objective of the study is to proceed to the census and characterization of this type of institutions in Portugal. The survey made it clear that such museological units, while quite recent, also materialize in very different forms. Therefore, in this survey each museum should respond to a questionnaire that systematized some pre-defined indicators. In order to make this diversity more intelligible, a typology of three models is proposed: the Specialized Corporate Museum, the Collection Corporate Museum and the Corporate Museum Showroom. Finally, we try to test the pertinence and applicability of the proposed typology by considering three study cases: the Underground Alliance Museum, the Ramirez Museum and the Viarco Exhibition where the field work was been carried out. As a pioneer study in Portugal, this work tries to open prospects future companies that aim at creating their museum.

Keywords: Museology; Corporate Museum; Survey Corporate Museums in Portugal; Types of Corporate Museum.

- **15223 | Profile of soybean allergenic proteins as affected by thermal processing and food matrix**

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Soybean is a food ingredient with numerous applications in the food industry due to its emulsifier properties and gelling capability, but it is also a food allergen. This work intends to evaluate the effect of food processing (autoclave and cooking) and food matrices (cooked hams and sausages) on the soybean protein profile. For these purpose, model mixtures of pork meat containing soybean protein isolate (SPI) or concentrate (SPC) were prepared in a concentration range of 10-0.001% (n=5). Model mixtures of pork meat with SPC (65% total protein) were heat treated (5 h, 68°C) to simulate cooked ham, while mixtures of pork with SPI (85% total protein) were autoclaved (15 min, 121°C) to mimic the production of sausages. Sample extraction was performed with Tris-HCl 100 mM buffer and protein concentration was determined by UV spectrophotometry. Samples were run in denaturing and native conditions, in SDS-PAGE or native gel electrophoresis, respectively. In denaturing conditions, preliminary results showed a distinct protein profile between soybean and pork meat. Model mixtures of cooked hams were affected by heat, leading to the elimination of most bands. The mixture of 10% of soybean presents bands with MW of 37, 17-18 and 15 kDa, corresponding to proteins most likely heat-resistant. In model mixtures mimicking sausages, the effect of thermal processing was also very drastic in terms of protein profiles. Currently, native conditions are being tested to understand the effect of processing on the conformational pattern of soybean proteins. Immunoreactivity assays using specific antibodies against soybean proteins will also be performed to identify allergenic proteins.

- **15224 | Inside *Iconografia Selecta da Flora Portuguesa* – The role of plant illustration in contemporary botanical studies and flora conservation**

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The book *Iconografia Selecta da Flora Portuguesa*, from Gonçalo Sampaio (botanist) and Sara Cabral Ferreira (illustrator), was firstly published in 1949. It contains 151 black & white drawings of Portuguese flora species. The original drawings are part of the scientific illustration collection of the Museum of Natural History and Science of the University of Porto (MHNC-UP). Despite this book represented a mark in the Portuguese botany, it was an incomplete posthumous edition. Its second edition (1988) was merely a facsimile. Besides preface, no text accompanies the images in this work. Thus, the reasons behind the selection of the represented species, as well as their past and present relevance in the Portuguese flora context, remains unknown.

In our project, we updated the iconography's taxonomic information and we analyzed the bibliographical production of Gonçalo Sampaio, in order to reconstruct the path that led to the compilation of this iconography. We gave particular attention to the species that were also target species in the Red List of the Vascular Plants of Continental Portugal, an ongoing project from the Portuguese Botanical Society. We also pretend to link the depicted species to correspondent priority habitats, as a way to understand the actual importance of these species to flora and nature conservation.

With the present study, we aim to understand the reasons behind the species selection for the iconography and their actual representation of Portuguese flora uniqueness. By analyzing this selection of plants of the first half of the XXth century, we also aim to explore plant iconographies importance to modern botanical studies. Finally, we would like to acknowledge the support of PRISC (Portuguese Infrastructure of Scientific Collections - POCI-01-0145FEDER-022168) (PRISC.pt).

Keywords: Botany, Portuguese Flora, Museum Studies, Scientific Illustration, Natural History

- **15225 | Blockade of UDP-sensitive P2Y6 receptor as a potential therapeutic target to prevent cardiac remodeling due to pulmonary hypertension**

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Pulmonary arterial hypertension (PAH) is characterized by progressive increases in pulmonary vascular resistance leading to right ventricle (RV) pressure overload. Uracil nucleotides are able to modulate cardiac function through the activation of metabotropic UTP (e.g. P2Y2, P2Y4 e P2Y11)- and UDP (e.g. P2Y6)-sensitive receptors, but their role on PAH is largely unknown. This study was designed to investigate the role of both UTP and UDP on growth and type I collagen production by cardiac fibroblasts (CFs) isolated from the RV of rats with PAH.

PAH was induced in male Wistar rats that randomly received a single subcutaneous injection of monocrotaline (MCT group) or vehicle (CTRL group). Rats with severe PAH were euthanized 3-4 weeks after MCT injection to isolate CFs from the RV. Cultured cells were characterized for proliferation /viability (MTT assay) and type I collagen production (Sirius Red assay).

UTP (100 μ M) increased growth and type I collagen production by CFs from CTRL rats (MTT values: $51.08 \pm 10.88\%$, $n=4-6$), but not from cells of the MCT group. The UTP metabolite, UDP (100 μ M), had a pro-fibrotic effect in both animal groups (MTT values: $17.52 \pm 3.21\%$ and $18.29 \pm 5.98\%$, $n=6$ in CTRL and MCT rats, respectively), which was operated by a MRS2578 (0.1 μ M)-sensitive P2Y6 receptor. The highly selective P2Y11 agonist, NF546 (10 μ M), decreased growth and type I collagen production by CFs from CTRL rats, but its effect was attenuated in MCT treated rats (MTT values: $-19.81 \pm 6.65\%$ and $-9.39 \pm 5.50\%$, $n=4-6$ in CTRL and MCT rats, respectively; $p<0.05$).

Data suggest that the pro-fibrotic effect operated by the UDP-sensitive P2Y6 receptor is unbalanced in CFs from the RV of animals with PAH. This occurs most probably due to a loss of function of the anti-fibrotic P2Y11 receptor. Our hypothesis is that blockage of UDP-sensitive P2Y6 receptor may be of therapeutic value to prevent cardiac remodeling in patients with PAH.

Work supported by FCT (UID/BIM/4308/2016).

- **15226 | Unravelling the functional consequences of TEC-specific deletion of p53 in T cell homeostasis**

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The immune system possesses unique mechanisms to cope with environmental threats. Among these mechanisms, functional self-tolerant T lymphocytes represent a critical member of the adaptive immune system and their development rely on instructive signals provided by the unique microenvironments of the thymus. Here, cortical (c) and medullary (m) thymic epithelial cells (TECs) comprise two distinct lineages with well-defined roles in T cell selection and tolerance induction. While little is known concerning the mechanisms that control TEC homeostasis, recent data from the host lab positioned the tumor protein p53 as a new molecular determinant of TEC biology. The conditional deletion of p53 on the thymic epithelium compromised the integrity of the mTEC niche. These alterations negatively influenced thymic functioning, which ultimately contributed to a reduced peripheral T cell pool in mutant mice.

In this thesis, we aimed at investigating the cellular and molecular basis behind the altered T cell compartment in p53cKO mice. Our extensive in vivo and in vitro characterization revealed no obvious defects on the functional and homeostatic capacity of p53cKO-derived T cells. Yet, we noticed that mature single positive thymocytes of p53cKO mice present an ineffective upregulation of the sphingosine-1-phosphate receptor 1 (S1PR1), pointing for the possible existence of an altered thymic output. Using adoptive transfer of RAG-GFP bone marrow-derived cells, we found a reduction in the number of recent thymic emigrants (RTEs) that are present in the spleen of p53cKO mice.

Collectively, our results suggest that the targeted deletion of p53 on the thymic epithelium had a severe impact on the thymic export of p53cKO mice, which contributed for a smaller peripheral T cell compartment.

- **15228 | In vitro evaluation of nanostructured functionalized platforms for the sustained delivery of cisplatin**

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Cisplatin has an extraordinary anticancer activity against a variety of solid tumors. However, its clinical efficacy is contrasted by its toxicity profile. Core-shell functionalized nanoparticles prepared and characterized by our group were evaluated for their effect on the viability and proliferation of two pancreatic cancer cell lines (PANC-1 and AsPc-1) and a non-cancer pancreatic cell line (H6C7).

Cisplatin showed a concentration-dependent cytotoxic effect (MTT assay) on both cancer and non-cancer cell lines. The cytotoxic effect of cisplatin-loaded nanoparticles (CisNano) towards cancer cell lines was less pronounced than that of cisplatin but, contrary to cisplatin, CisNano was less cytotoxic toward non-cancer cells.

Cisplatin and CisNano showed a concentration-dependent necrotic effect in the three cell lines (LDH assay), with CisNano being more potent in relation to the cancer cell lines than cisplatin. Moreover, CisNano induced a much stronger necrotic effect in the two cancer cell lines than in the non-cancer cell line. In contrast, the necrotic effect of cisplatin was similar in a cancer (Panc-1) and a non-cancer cell line.

Finally, cisplatin presented a more marked antiproliferative effect (3H-thymidine assay) than CisNano in relation to all cell lines. However, the antiproliferative effect of cisplatin was similar in a cancer (AspC-1) and the non-cancer cell line (H6C7). In contrast, CisNano presented a much more marked antiproliferative effect in the two cancer cell lines than in the non-cancer.

We conclude that CisNano, in comparison with cisplatin, is more potent in inducing necrosis but less potent in reducing cell viability and proliferation. However, in contrast to cisplatin, CisNano possesses a much more discrete effect in non-cancer pancreas cells than in cancer cells. So, these conjugates possess a higher selectivity toward cancer cells and may be promising carriers for intravesical delivery of cisplatin for pancreatic cancer therapy.

- **15229 | To do Public Archeology in Brazil: History, Aplicability and Heritage Education**

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The concept of Public Archeology began to be used in the United States in the early 1970s in association with the management of cultural resources. In the following decades, the use of the term brought with it a semantic expansion that eventually provided critical discussions about the multiple positions of archaeologists and archeology in the conflicts derived from the processes of interpretation about the past. If the past is fundamental to the conception of Modern life and our relationship with it shapes sensitivities and identities, critical positioning is indispensable when defending democratic principles or re-signifying traumatic historical moments. According to Boaventura Santos (2010) Colonialism was also an epistemological domination, an extremely unequal relationship of knowledge and power that led to the suppression of many forms of knowledge proper to colonized peoples and nations, relegating many other knowledge to a space of subalternity. In Brazil, public archeology, understood as an ethico-political doing is a recent phenomenon. The country's own legislation regarding archeology and archaeological heritage, although not recent, has a more incisive applicability nowadays. With the creation of ordinance 230/02, which established as mandatory the carrying out of educational actions, the so-called "Heritage Education", in projects of Preventive Archeology. As Mário Chagas (2004) said the field of Heritage Education is not peaceful, on the contrary, it is a disputed territory, open negotiations and disputes of meanings. Such as the field of public archeology itself. The purpose of this communication, as a part of my master dissertation, is to discuss from the content analysis what constitutes public archeology, its applicability in Brazil and how its practice fuses with the practice of Patrimonial Education in the country.

- **15230 | Impact of Depression and Anxiety on Sexual Functioning in Couples Trying to Conceive With and Without an Infertility Diagnosis**

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Depression and anxiety are significantly associated with several aspects of facing infertility and of sexuality. However, there are few studies examining the impact of psychological symptoms on sexual functioning in infertility using couples as the unit of analysis. This study is the first to investigate actor and partner effects of depression and anxiety on sexual functioning, moderated by having knowledge of the infertility diagnosis. A sample of 107 couples trying to conceive was invited to participate in the study. 63 couples were assigned to group 1 (couples with infertility diagnosis) and 44 to group 2 (not diagnosed couples). The data was based on an online survey measuring *International Index of Erectile Function (IIEF)*, *Female Sexual Function Index (FSFI)* and *Hospital Anxiety and Depression Scale (HADS)*. Different analyses were conducted to better understand the relationship between infertility, psychological symptoms, and sexual functioning, and an *Actor-Partner Interdependence Moderation Model* was used to examine the couple as the unit of analysis. No differences regarding psychological and sexual functioning were found between groups, except for sexual desire, which was lower in infertile men. APIM findings suggest a moderating effect of an infertility diagnosis between male depression and male sexual functioning, revealing a decreased sexual functioning in the presence of depression in infertile men. Women's depression was related to a decrease in female sexual functioning. In conclusion, receiving an infertility diagnosis might play a key role in male sexual functioning in the presence of depression. The findings reinforce the need for the male partner's involvement throughout the treatment process and infertility counseling.

- **15231 | Can the combined treatment of dapagliflozin and exenatide protect the nutritional support of spermatogenesis?**

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Obesity and type 2 Diabetes (T2D) are metabolic diseases that are spreading among children and adolescents. Both diseases are tightly linked and thus new approaches for T2D treatment aim to decrease glucose levels, while provoking weight loss. Recently, a combined therapy of dapagliflozin (DPG) (sodium-glucose cotransporter inhibitor) and exenatide (EXN) (glucagon-like peptide 1 analogue) was implemented against T2D. It influences all-body glucose metabolism, potentially affecting other tissues. Spermatogenesis is highly dependent on the metabolic cooperation established between Sertoli cells (SCs) and developing germ cells. The former use extracellular glucose to produce lactate, which germ cells use as fuel. In this work, we studied the effects of DPG and EXN on SCs metabolism. For that, mice SCs (TM4) were treated in the absence (control) or presence of sub-pharmacologic, pharmacologic and supra-pharmacologic concentrations of DPG (50, 500, 5000 nM, respectively) or EXN (2.5, 25, 250 pM, respectively) for 24 hours. Cytotoxicity of these compounds on SCs was evaluated by MTT and SRB assays. The glycolytic profile of SCs from all experimental groups was also determined (¹H-NMR spectroscopy). Pharmacologic concentrations of DPG altered SCs metabolic activity and decreased cell proliferation. SCs treated with pharmacological concentrations of DPG secreted more lactate, while maintaining glucose consumption, when compared with cells from the control group. Moreover, SCs treated with both DPG and EXN consumed less pyruvate, at any of the concentrations used. Enhanced lactate production has been reported to improve sperm production and quality. Thus, our results suggest that the treatment with these two pharmacological agents can protect the fertility of males while improving their glucose homeostasis and inducing weight loss. Further studies will be needed to explore the mechanisms by which these agents exert their effect in the nutritional support of spermatogenesis.

- **15234 | Evaluation of the toxicity induced by mitoxantrone in different aged mice**

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Mitoxantrone (MTX) is a chemotherapeutic drug used in the treatment of several types of cancer and multiple sclerosis; however, it can induce cardiotoxicity that can be enhanced in the presence of some risk factors. MTX cardiotoxicity is still poorly studied and its metabolites may be, in part, responsible for it. This work aimed to study the influence of age in MTX-induced toxicity in CD-1 male mice. Infant (4 weeks), adult (3.5 months) and elderly (1.5 years) mice were used. They received bi-weekly injections of either saline or MTX (cumulative dose: 6 mg/kg), for 3 weeks, and clinical evaluation was done regularly. The sacrifice occurred 17 or 7 days after the last administration for infants and adults/ elderly, respectively. The brain, heart, kidneys, spleen, liver and blood of the animals were collected, being the heart histologically evaluated. Plasma was analyzed using a high-performance liquid chromatography with a diode array detector (HPLC-DAD), to detect MTX and its metabolite naphtoquinoxaline (NAPHT).

MTX caused significant weight loss in the adult mice, and significant reductions in food and water consumptions in the adult and infant treated mice. All the organ weight/ brain weight ratios in the adult MTX-treated mice were significantly decreased, as so the elderly's spleen /brain ratio. MTX caused cardiac histologic changes, being the damage more prominent in adults. Neither MTX nor NAPHT were detected at the conditions set by us. Summing up, the adults seemed more susceptible to the MTX-induced toxicity; however, new pharmacokinetic analysis must be done regarding the levels of the chemotherapeutic drug and its metabolite in plasma/organs to ascertain their influence on MTX-toxicity.

ARM and VMC acknowledge FCT for grants: SFRH/BD/129359/2017 and SFRH/BPD/110001/2015. This work was supported by FEDER funds [Operational Programme for Competitiveness Factors - COMPETE and by FCT within the project "PTDC/DTP-FTO/1489/2014 - POCI-01-0145-FEDER-016537"]

- **15235 | Influence of urbanization in shaping the spatial patterns of the epifaunal assemblages associated with *Chthamalus* barnacles**

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Urbanisation of coastal areas is a major threat affecting the intertidal zone of many shores worldwide. This anthropogenic disturbance may alter the structure and composition of the intertidal communities due to the loss of biodiversity and the alteration of the spatial patterns of organisms' distribution. In the present study, the epifaunal assemblages associated with *Chthamalus* barnacles were considered in rocky shores with different conditions of urbanisation. The aim was to evaluate the differences on the spatial patterns of variability of the barnacles' epifauna between urban and extra-urban shores. Two urban and two extra-urban shores were selected along North Portugal coast. At each shore, two sites were considered and five quadrats of 10 x 10 cm were sampled, in which the enclosed barnacles were removed with a scrapper and then preserved in formalin (4%) with Rose Bengal. At the laboratory, each sample was washed in a sieve of 0.5 mm mesh size and the epifauna was sorted and determined to species level. A total of 16,283 animals were found. The total abundance, Shannon-Wiener index and taxa richness of the epifaunal assemblages were tested by means of analysis of variance (ANOVA) between shore conditions. Permutational analysis of variance (PERMANOVA) was used to explore the differences between conditions in the multivariate epifaunal assemblages. These analyses did not reveal significant differences between conditions. The spatial variability of the epifaunal assemblages was tested by means of ANOVA between conditions and between different spatial scales (shore, site, replicate). The results only revealed significant differences between scales and between the interaction condition x scale. Posteriorly, Student-Newman-Keuls post-hoc test was done to compare variances at each spatial scale between conditions. The results of this test allowed to conclude that, at the scale of site, significant differences between urban and extra-urban shores were found.

- **15237 | Integral pasta with Spirulina and Himanthalia elongata algae: Nutritional and antioxidant contribution**

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Pasta products are worldwide consumed and well-accepted by all age groups due to their sensory and nutritive values, low cost and easy preparation. It is a good source of dietary fibre and energy due to its carbohydrate content. Healthy ingredients as algae, have been used in pasta production to enhance nutritional and/or functional properties (high-protein sources and antioxidants, anti-inflammatory) [1]. Spirulina is a microalga, known as a good source of protein (50-70g/ 100g) and it has attracted attention due to high bioactive compounds with antioxidant activity [1]. *H. elongata* has high fiber content and many studies report it as a good source of biological compounds, particularly polyphenols [2]. The aim of this study was to evaluate the nutritional and antioxidant properties of an integral pasta enriched with 2% of *H. elongata* and 1.5% of Spirulina and compare it with a sample without enrichment. Both samples were analysed before and after cooking. The same experiments were performed in the remaining water and dried Spirulina and *H. elongata* samples. The results showed an increase in protein content around 3% with the addition of algae, possibly due to Spirulina as this microalga shows a protein content of 55%. Besides, the antioxidant potential of *H. elongata* and Spirulina extracts, when add to pasta in 2% and 1.5%, respectively, no increase on total phenolic compounds was observed. However, the remaining water contain the phenolic compounds, suggesting that should not be discarded.

References

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Acknowledgements: S.M.F. Bessada acknowledges the PhD fellowship (SFRH/BD/122754/2016) funded by FCT.

- **15238 | Rheological study of a Metronidazole Vivapur MCG 811P oral gel developed for veterinary use**

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There is a lack of veterinary pharmaceutical specialties for several drugs, forcing veterinaries to adapt human medication. Factors like specie, weight, age, among others, make large-scale production difficult, since one formulation may not respond to the needs of all animals. Metronidazole, a widely used drug for the treatment of protozoal and anaerobic bacterial infections, is one example of such a problem. In the Portuguese market, this drug is only available in the form of tablets, making drug dose adjustment and administration difficult.

Pharmaceutical compounding, the art and science of personalized medication preparation, can answer to this situation. Since it allows a flexible production, the medication can be easily adapted. Hence, a compounded oral gel formulation was developed for dogs and cats. Taking in mind the wide variety of races that come in different sizes and weights, a syringe-like device to regulate the administrated dose was selected. For this effect, the gel should present a thixotropic behavior to ease the flow when administering but allow a viscous behavior when resting; thus, Vivapur MCG 811P was chosen as a gellification agent. Various gels with concentrations of 3.5% and 5.0% of Vivapur, using a T25 digital UltraTurrax (UT) with different speeds and times of mixing, were studied, using a Kinexus lab+ Rotational rheometer (Malvern Panalytical, UK). The 5.0% formulation was selected since it showed a higher viscosity (23.14 ± 1.36 Pa.s) when compared to the 3.5% formulation (11.94 ± 0.75 Pa.s). To simplify production, the preparation was studied using only magnetic stirring for the polymer activation. It was concluded that the UT had minimal difference in the viscosity values. Finally, the influences of the metronidazole, preservatives and liver aroma on the gel's rheological behavior were evaluated, showing no noteworthy differences. The next phase of development is to verify the chemical and physical stability of this formulation.

- **15239 | The reproduction of *Sepia bandensis*: mating and spawning site selection by the dwarf cuttlefish**

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Cephalopods are an incredibly interesting and successful class of Molluscs, due in great part to the adaptability that their advanced cognition provides.

The dwarf cuttlefish, *Sepia bandensis*, is a small species endogenous to the tropical seas of the Indo-Pacific area and favoured for keeping by aquarists.

With fleeting life spans of about one to two years, they die after mating and spawning, and so, behaviours performed during the reproductive life phase that increase the offspring's chances of survival will be selected upon. An example is the spawning site selection by the female, who lays clusters of eggs fixed to a substrate, exposing the embryos to the various environmental conditions of the site during their developmental period.

We aimed to attest that the female does have mechanisms through which she can evaluate and select the most suitable spawning site and that given the choice, she would show a clear preference for a more natural looking location over an artificial one. The behavioural patterns show during reproduction were also thoroughly documented and characterized.

To this end, specimens collected in the Wakatobi National Park, Indonesia, were studied in an on-location laboratory. Groups of cuttlefish were placed in a tank, where one half simulated a natural habitat and the other an artificial setting.

Data was obtained through direct observation of the oviposition site and video recording of the main experiment tank (up to 8 h/day for 3 weeks, on two angles). Also, every reproductive event that occurred in the holding tanks was registered. The footage was analysed for the various behavioural cues through the creation of ethograms.

In terms of spawning site preference, all the groups that laid eggs fixed the produced clusters on the natural habitat side. The assessment of the reproductive patterns in *S. bandensis* is also of interest for husbandry and breeding in artificial settings, both from a hobby and conservation point of view.

- **15240 | Black Soldier Fly (*Hermetia illucens*) meal as a fish meal substitute in diets for meagre (*Argyrosomus regius*): effects on gut microbiota**

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Fishmeal (FM) is considered the optimal protein source for aquafeeds, but its availability has been decreasing and price raising, which reflects in aquafeeds costs. Research has thus focused on discovering cost-effective and sustainable alternatives to FM, such as insect meal. In this study, we evaluated the effect of replacing dietary FM by *Hermetia illucens* meal (HM) on the intestinal microbiota of meagre *Argyrosomus regius* juveniles. Four isoproteic (50% protein) and isolipidic (19% lipid) diets were tested in a growth trial. A FM-based diet was used as control (CTR diet) and 3 other diets were formulated to include 10%, 20% and 30% of *Hermetia illucens* larvae meal (HM10, HM20, HM30, respectively). Each diet was fed to triplicate groups of fish (initial weight: 18 g) for 9 weeks. At the end of the trial, the intestinal mucosa and contents (digesta) of fish fed each diet, were aseptically collected to assess the autochthonous and allochthonous microbial communities, respectively.

Microbiota profiling of meagre intestines revealed that, in digesta-associated communities, replacement of FM by HM led to a decrease in the average number of operational taxonomic units and microbial diversity but to an increase in microbial similarity. Such an increase was also observed in mucosa samples at 20% HM inclusion, that contrarily to digesta, showed no differences between diets for the other microbiota indices. In conclusion, this study showed that HM is a promising ingredient for meagre juveniles diets, since an inclusion of up to 20% had no negative effects on the autochthonous microbiota, while contributing to a higher microbial similarity within dietary replicates (i.e. an identical microbiota profiling among experimental fish, which anticipates a more homogeneous fish-response).

Acknowledgments: This study was funded by IJUP/SOJA DE PORTUGAL (PP-IJUP2017-SOJA DE PORTUGAL-33) and by Fundação Amadeu Dias, with a grant included in the IJUP Project.

- **15241 | Extracellular Vesicles secreted by Dendritic Cells can recruit Mesenchymal Stem/Stromal Cells: the impact of bone injury**

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Bone repair requires communication between immune and skeletal cells, including mesenchymal stem/stromal cells (MSC), which can differentiate into osteoblasts. This crosstalk may occur via cell-cell contact or secreted factors, including extracellular vesicles (EV) 1. In our previous work, naive human dendritic cells (DC) secreted EV that could promote human MSC recruitment 2. Here, we hypothesize that the bone injury microenvironment could precondition DC and impact the function of their secreted EV.

An in vivo model of rat femoral defect was performed, and animals sacrificed at 3 and 14 days after bone injury. Non-operated and sham-operated rats were used as controls. Bone marrow cells were isolated, DC differentiated ex vivo, EV isolated by ultracentrifugation and characterized. Interestingly, the results obtained showed that DC-EV from non-operated and 14 days post-bone injury significantly promoted rat MSC migration, compared to those from 3 days post-injury. This ability was confirmed to be specific, as EV from sham-operated controls were not capable of promoting MSC migration. Also, DC-EV did not impact MSC proliferation or differentiation. Analysis of DC-EV content by cytokine antibody membrane array indicated that EV from 14 days post-injury DC were depleted of TIMP-1 and TNF- α , relatively to day 3 EV. Western blotting of DC total conditioned media confirmed the depletion of TIMP-1 at 14 days post-injury.

Overall, our work further unravels the crosstalk between DC and MSC in the context of bone injury, suggesting new strategies for development of EV-based bone regenerative therapies.

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Acknowledgments: work funded by project NORTE-01-0145-FEDER-000012, Norte Portugal Regional Operational Programme, under PORTUGAL 2020 Partnership Agreement, through European Regional Development Fund (ERDF); Portuguese funds through FCT, PhD (AMS, JHT) and Post-Doc (MIA, CC) fellowships.

- **15242 | Reinsurance Treaties Analysis**

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The reinsurance is one of the mechanisms the insurance companies have to mitigate some of their risk. Reinsurance treaties are negotiated annually and generally don't cover all risks, therefore an analysis of each case is required to determine which type of reinsurance is the most adequate.

In this work, we study some reinsurance treaties by applying stochastic orders, in particular the convex order, so that we may sort them by their level of risk. Mixtures of these treaties are studied and sorted too, since they are also used in the reinsurance world.

Furthermore, we consider also order statistics based reinsurance, which are not usually considered in a real world scenario.

A statistical analysis of a data set of claim amounts is developed in order to perceive their behaviour and evaluate the most adequate type of reinsurance to either the reinsurer or the cedant.

Keywords: extreme value theory, reinsurance treaties, stochastic orders

- **15243 | Evolution of the controller role - A case study**

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The controller role has taken greater importance in the organizations, especially the ones of bigger size and complexity. By having access to privileged information on economic and financial aspects of the organization, the controller has the potential to create value and its role has undergone significant evolution, which has been subject of academic research.

Given these premises and together with the fact that the author is a controller in the organization in study and has preliminary information that indicates that the controller role has evolved, this study intends to evaluate the evolution of the role of the controller in this particular organization, the factors that have contributed to this evolution and the profile and competences of this "new" controller.

For that purpose, interviews have been carried out to managers and controllers of the organization, chosen based on their geographic location and antiquity in the company. Internal documents on the subject have been analysed and day-to-day observations, from before and after the study, have been considered. The conclusion is that there was notorious evolution in the role of the controller in this organization. The group has given greater highlight to the controller role by creating a new hierarchical position for the controllers in the company, giving them independence from managers, yet fully involving them in the management team. However, in this new organizational configuration of the role, some tension was found between different roles and divergences in the management of expectations and goal alignment. Finally, it was found that not all controllers have the desired profile of "business partners" because of their lack of experience in the company, which is proven to be a key factor in the evolution of the role of controller.

- **15247 | Baker's yeast as a model for toxicity assessment of ionic liquids**

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Saccharomyces cerevisiae, also known as baker's yeast, has been regarded as a simple, yet valuable, eukaryotic model for the toxicity evaluation of a variety of compounds. It brings a lot of advantages when compared to other models, since it is inexpensive to cultivate, easy to manipulate, has simple nutritional needs, a fully sequenced genome and a high homology to the mammalian systems [1].

The increased and indiscriminate use of ionic liquids (ILs) may lead, in a near future, to the contamination of water and soils through effluents discharge or leaching of landfills [2]. Therefore, the development of assays able to assess ILs' toxicity is extremely important to prevent potential environmental and human health related problems.

Thus, this work is focused on the evaluation of ILs' toxicity using the methylene blue dye reduction test. The reduction of methylene blue by the living *S. cerevisiae* cells results in the formation of a colorless product and, consequently, in a decrease of the optical density [3].

Acknowledgements

This work received financial support from the European Union (FEDER funds POCI/01/0145/FEDER/007265 and UID/BIA/04050/2013 (POCI-01-0145-FEDER-007569) and National Funds (FCT/MEC)) under the Partnership Agreement PT2020 UID/QUI/50006/2013. Also by POCI-01-0145-FEDER-030163, financed by FEDER funds through the COMPETE 2020-Operational Programme for Competitiveness and Internationalization (POCI), Portugal 2020.

Ana M.O. Azevedo thanks FCT for her PhD grant (SFRH/BD/118566/2016).

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- **15251 | Exploring human placenta-derived hydrogels as a microenvironment for 3D cell culture**

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Organ and tissue decellularization has been explored as a strategy to produce extracellular matrix (ECM) biologic scaffolds for tissue engineering. Currently, different types of decellularized tissues/organs are being used as scaffolds, both in in vitro cell culture studies and in different clinical applications for tissue repair. Human placentas are widely available, can be harvested without harm to the donor and are commonly discarded after delivery. Moreover, placental tissue contains abundant amounts of ECM components and important growth factors, thus providing a very appealing source for tissue decellularization.

The aim of this work was the development and characterization of placenta-derived hydrogels, using optimized protocols for tissue decellularization and solubilization, and their evaluation as 3D matrices for in vitro culture of stromal cells.

Placental maternal villous samples were successfully decellularized following a 5-days protocol with SDS/DNAse treatments, adapted from literature. Histological analyses showed high removal of cellular/nuclear contents and preservation of ECM components. Biochemical analysis showed the presence of high amounts of total protein and glycosaminoglycans. Decellularized ECM (dECM) was solubilized through acid-pepsin digestion, allowing the successful production of hydrogels. These were characterized in terms of gelation kinetics and viscoelastic properties, which varied with dECM concentration. Fibroblasts and mesenchymal stem cells (MSC) were cultured on-top of dECM hydrogel discs, and cell viability, metabolic activity and morphology were assessed. Overall, dECM hydrogels provide favourable microenvironments for cell culture, supporting cell adhesion, viability and proliferation. Taken together, these results show that protocols for decellularization/solubilization of placental maternal villous were successfully established, allowing the formation of promising hydrogels as human-derived matrices for cell culture.

- **15253 | Intestinal colonization of patients at a Neurology Ward in the North of Portugal with Antibiotic Resistant Bacteria – co-colonization with different threats**

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Spread of multidrug-resistant (MDR) bacteria is concerning, especially in hospital environment. The risk of antibiotic-resistant bacteria dissemination, outbreak installation and clinical complications in susceptible patients are a serious public health problem. This is the first description of MDR isolates co-colonizing patients at a northern-region portuguese hospital.

Fifteen random fecal samples were collected in Neurology ward. Isolates were selected in MacConkey agar and MacConkey agar supplemented with cefotaxime, ciprofloxacin and meropenem (2 µg/mL). Colonies in antibiotic supplemented media were selected for further studies, according to the EUCAST. Presumptive identification was achieved by CHROMagar™ Orientation and confirmation by ID32GN. Extended-spectrum beta-lactamase (ESBL) and carbapenemase-producing isolates were studied by PCR. Carbapenemase-producing isolates were subjected to sequencing of the codifying gene.

Thirteen of 15 collected samples were selected for study. Samples had 1 to 3 different MDR bacteria. We found isolates producing ESBL, carbapenemases (2 KPC-2), plasmidic AmpC β-lactamases, ESBL plus ciprofloxacin resistance, ESBL plus plasmidic AmpC β-lactamases, carbapenemase plus ESBL, carbapenemase plus ciprofloxacin resistance (CR) and carbapenemase plus ESBL plus CR. We found 10 *Klebsiella pneumoniae*, 6 *Pseudomonas aeruginosa*, 6 *Escherichia coli*, 1 *Enterobacter cloacae* and 1 *Proteus spp* resistant to antibiotics. Some were co-colonizing the patient.

Intestinal carriage of MDR bacteria represents a hidden reservoir and risk for dispersion of these threats. Our results show the importance of patient microbiota analysis during hospitalization in order to avoid outbreaks and clinical complications. Detection of intestinal colonization with resistant bacteria is relevant in terms of infection control to prevent intra-hospital dissemination and to avoid community spread after patient discharge.

- **15255 | Digital Architecture Platform: The rethinking of tradition and the promotion of architecture through the use of new technologies**

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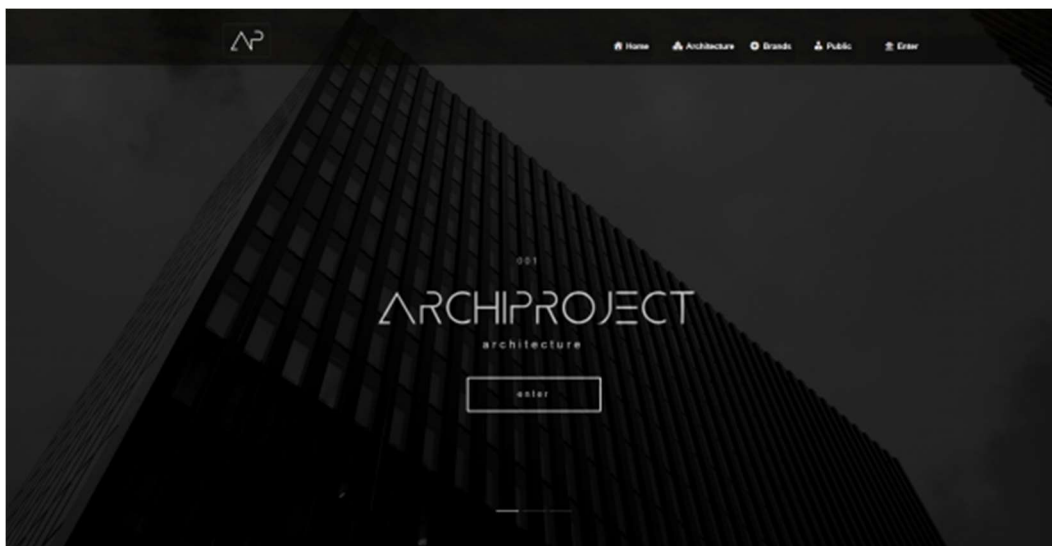
This presentation features the research in-progress on "Digital Architecture Platform: The rethinking of tradition and the promotion of architecture through the use of new technologies", which has been developed in the context of Master's Degree in Architecture at FAUP, under the supervision of Prof. Gonalo Furtado.

The evolution of the new digital technologies has brought a series of new possibilities with the integration of new forms of interaction in different areas. Today, the Internet provides an element of great communicative and informative spreading and a strong potential to be explored.

The objective is to bring architecture, building enterprises and the general public closer together, as well converge to the use of new communication technologies of these three areas of study that have been little explored, in particular, in the national panorama.

This research is divided into three central parts. The first is a contextualisation of the contemporary digital culture. The second is an investigation of the historical and contemporary systems of representation, communication and information about this three areas to be developed in the digital platform- Architecture, Construction and the Public in general- that intends to frame and provide the conceptual bases for the development of the digital platform. And, finally, a third part, the realization of the prototype of this digital platform.

The purpose of this digital platform is to rethink some features, namely, communication, representation and promotion of architectural culture, building enterprises and public real estate, through the use of new digital technologies capable of integrating these new realities and possibilities and visualizing the interconnection of these three different worlds into a single innovative digital space that seeks to challenge our understanding of themselves.



Homepage of Digital Architecture Platform: Archiproject

- **15257 | The impact of postural changes in patients with acute cerebral lesion**

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Introduction

An acute brain injury (ABI) usually may impair the autonomic nervous system (ANS) and cerebral autoregulation manifested by orthostatic intolerance. Physiologically, when the standing position is adopted blood moves from the upper body to the lower segments and such relative hypovolemia causes a sympathetic reflex increasing contractility and heart rate. Consequently, the increased cardiac output triggers a parasympathetic reflex, resulting in vasodilatation and decreased heart rate. The brain circulation needs to be able to adapt to these systemic changes and this vital mechanism is called autoregulation. Multimodal monitoring of cerebral autoregulation related to systemic variations can be used to indirectly access the effect of ABI on ANS. The tilt-table applied in an early phase to patients recovering after ABI is expected to trigger the sensorial and ANS pathways and create the conditions to improve rehabilitation.

The aim of this study is to evaluate the systemic and brain physiological adaption of patients after ABI to the orthostatic challenge, through systemic and brain monitoring, using tilt-table, as a rehabilitation method to improve the sensitive inputs and ANS function.

Methodology

Multimodal systemic and brain monitoring with ECG, heart rate, respiratory rate, endtidal CO₂ and pulse and brain oximetry are recorded during orthostatic challenge according to a rehabilitation protocol. The clinical and rehabilitation data will be coupled with monitoring in order to evaluate the brain and systemic adaption to orthostatism.

Discussion and Conclusion

The study of systemic and brain monitoring during early introduction of orthostatic training may help to learn the adaption of nervous pathways during the rehabilitation after ABI. By applying the tilt table test we expect to detect which patients will be able to maintain cerebral autoregulation and to document how this rehabilitation method can contribute to post-ABI recovery.

- **15258 | Enzyme activity assays by sequential injection analysis**

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In this work a sequential injection methodology has been developed for the evaluation of β -Galactosidase activity. These studies are usually performed in batch mode with drawbacks associated with time spent, human intervention and consumption of reagents. In this context, it seems that the automation of these procedures could further increase their potential and significance. Among flow techniques, sequential injection analysis (SIA) has been profitably applied in biocatalytic procedures, including enzyme activity assays [1]. Thanks to precise timing, flow control, simplicity and strict reaction conditions it gives high reproducibility, which is important in kinetic proving to be a robust and accurate tool for the implementation of enzyme activity assays. Besides, it reduces sample volumes with a minimization of waste production which contributes to a greener chemistry.

It was chosen a fluorimetric reaction, and a non-fluorescent probe 4-methylumbelliferyl- β -galactopyranoside (4-MUG) as substrate for the enzyme. This is hydrolyzed by the enzyme into galactose and 4-methylumbelliferone a fluorophore. The fluorescence intensity is proportional to enzyme activity which allows the measurement in different conditions [2].

Parameters such as pH, temperature, volumes, concentrations and buffer composition are assessed for an estimation of the best conditions for the kinetic evaluation.

Acknowledgements

Financial support from the European Union (FEDER funds POCI/01/0145/FEDER/007265) and National Funds (FCT/MEC, under Partnership PT2020 UID/QUI/50006/2013). Also by FEDER Funds through the COMPETE and by FCT - within the scope of the project POCI-01-0145-FEDER-030163.

M.P. thanks FCT for the financial support.

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- **15260 | The Cost of Fear of Crime: Violent and Nonviolent Burglary**

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The fear of being victimized, whether at home or in the street, is a common one. This fear can engender protection behaviours, such as the purchase of security systems, which can at times be synonymous with hefty sums. The goal of this study was to analyse the costs incurred in anticipation of burglaries, and how these costs were connected with the fear of crime or, in other words, the impact fear of crime has in the residential context and the changes (behavioural, financial or otherwise) it leads to. With this goal in mind, 201 questionnaires were handed out. The results suggest that many of the protection behaviours being taken into account are fundamentally mundane actions, so much so that they do not appear to be motivated by fear (i.e., the emotional component of the fear of crime) nor by the perceived risk of victimization (the cognitive component). We can, however, say that spending money to protect one's domicile is already an indicator of a heightened fear of crime. These results highlight the necessity to devote further study to the behavioural component of the fear of crime, and how this component relates to the perceived risk of victimization and fear.

- **15263 | On the optimal pressure tap design for microfluidic channels**

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In recent years, the use of micro-robots for biomedical applications has been under study, as their small size proves ideal for performing minimally invasive procedures inside the human body. Modern advances in experimental microfluidics made it a suitable platform for carrying out such studies, allowing the characterisation of the complex flow dynamics in play inside the human circulatory system, at a micro scale simulated environment. In order to assess the dynamic efficiency of these microdevices, the pressure drop caused by their presence within the blood flow needs to be taken into account. However, even the most experienced experimentalist struggles when it comes to measure pressure in a microchannel, mostly due to air bubble problems and surface tension phenomena, which are quite frequent at this length-scale and known to negatively impact the accuracy of pressure readings. In an attempt to tackle this issue, a parametric study was devised to evaluate the performance of different pressure tap configurations, 18 in total. These are the result of several combinations between the three shape parameters: sub-channel width (w), and sub-channel–tap radius (R) or angle (α). To do so, pressure drop measurements were carried out with the taps along the length of a straight microfluidic channel ($270 \times 100 \mu\text{m}$) and later compared to theory. The pressure was sensed with piezoresistive sensors, the test fluid was de-ionised (DI) water and the microchannels were fabricated out of polydimethylsiloxane (PDMS) using standard soft-lithography techniques. Pressure taps having a smooth sub-channel–tap transition, characterised by the radius R , and a sub-channel width, w , of $108 \mu\text{m}$ performed the best. In particular, results from that of radius $R=50 \mu\text{m}$ only failed theory by $\sim 5\%$, making it the optimal configuration within the study's framework, and thus a reliable choice for any future works.

- **15267 | Using Grover's Search Quantum algorithm to solve Boolean Satisfiability Problems.**

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Satisfiability problems (SAT-problems) have been one of the most important tools in classical computing. These types of problems are well known in Computer Science due to the fact of being the first ones to be proven NP-complete. This means that as the size of the problem grows, the time it takes to solve it increases rapidly, also that all problems labelled NP are in the worst case as hard to solve as a SAT. Great efforts are put into solving these types of problems in the most efficient way possible, mainly because they have numerous practical applications, going from Software Verification to Artificial Intelligence.

Using classical computing and classical algorithms to solve a SAT problem has not shown significant improvements. New methods must be explored. One of them is using an alternative model of computation that has proven to reduce the complexity of some classical problems: quantum computing.

This work presents a better way to solve SAT problems using a quantum algorithm. Such is possible due to quantum computing properties, that can be exploited in order to solve different types of problems in a more efficient way, it also involves a different way of approaching a problem and opens different paths that a classical computer just can't compete with.

The Grover's Search quantum algorithm was the one used to approach this problem. A SAT problem is translated to a quantum circuit. Each literal in a clause is a qubit. Knowing that qubits are reversible, we only use n qubits in the conversion, n being the number of literals in each clause. This already shows an improvement when compared to classical computers. Single and multiple qubit quantum gates are then used to do the remaining operations and the construction of the algorithm.

- **15269 | Small RhoGTPase Rac1 is essential for microglia homeostasis and neuronal function in the adult brain**

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Microglia, the largest immune resident cell population in the brain, constitute around 10% of all the glial cells in the adult brain. Within the brain parenchyma, microglia are responsible for immune surveillance, innate immune responses and the sculpting of the neuronal circuitry. Besides, these cells constantly extend and retract their dendrites to survey the brain parenchyma for threats. Such morphological changes are likely to require a very dynamic reorganization of the microglial cytoskeleton. Rho GTPases are key players in actin cytoskeleton dynamics and reorganization. Rac1, a classical member of this family, is associated with lamellipodia formation and membrane elongation. In immune cells, Rac1 is also involved in reactive oxygen species generation, phagocytic cup formation and in the regulation of NF- κ B activity. Because microglial functions require the remodeling of the cytoskeleton, we hypothesized that Rac1 might control several aspects of microglia homeostasis. Here, we studied, for the first time, the roles of Rac1 in adult microglia in steady state and during neuroinflammation. To achieve this, we used conditional tissue-specific gene targeting with the Cre/lox system to generate mice in which Rac1 ablation was restricted to microglia in the adult brain. Microglia-specific Rac1 mutant mice displayed notorious disruption of adult microglia homeostasis. In addition, depletion of Rac1 abrogated classical microglia immune signaling-linked with redox balance and lipid sensing, which rendered Rac1-deficient microglia completely refractory to neuroinflammation. We also found a significant reduction of excitatory synapses in the neocortex and in the hippocampus of microglia Rac1 mutant mice, which correlated with sociability deficits in these animals. Overall, our results suggest that Rac1 deficiency disrupts microglia homeostasis and affects neuronal function in the adult brain.

- **15271 | Differences of squat and countermovement jumps performance between young water polo and handball players (INEX Project)**

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Water polo and handball are intermittent sports with repeated and intense actions, particularly elevations and vertical jumps. However, they occur in very different environments. The aim of this study was to observe the relationship between squat and countermovement jumps performance in young water polo and handball players. Complementarily, the differences between those jumps within each sport were evaluated. Seventy male, 32 water polo and 38 handball players (age: 13.18 ± 0.60 vs 13.15 ± 1.23 years old, body mass: 53.19 ± 10.07 vs 55.23 ± 16.49 kg and height: 1.61 ± 0.09 vs 1.60 ± 0.11 m, respectively) performed three squat and three countermovement jumps (with 1 min interval) in a force platform (Bertec Inc., Columbus, Ohio, USA) operating at 2000 Hz. Independent and repeated T tests were conducted to compare the jumps variables between sports and to assess differences between jumps in each sport (respectively). All statistical procedures were conducted on SPSS 25.0 (IBM, Armonk, NY, USA). Results evidenced that water polo players jumped higher than their handball counterparts (0.25 ± 0.06 vs 0.20 ± 0.04 m in squat jump and 0.26 ± 0.05 vs 0.21 ± 0.05 m in countermovement jump, respectively) and the highest height values were obtained in countermovement jump in both sports. In opposition to what was expected, water polo players showed higher lower limbs force and power development capacity, which probably occurs due to the constant and systematic lower limbs action (e.g. eggbeater kick) during training and competition as in water polo there is no solid support. However, contrary to water polo players, handball players typically use the stretch-shortening cycle during their jumps performed in training and competition, reason why we were expecting better performances compared to water polo players. In future studies we will analyse larger samples of different age groups of both sports to better understand this problematic.

- **15274 | Single Conformational vs. Multi Conformational QM/MM: The desulfination reaction of DszB**

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One of the main causes of acid rain and carcinogenic particulate matter formation is the emission of sulfur oxides originated from the combustion of sulfur containing compounds, some of which are highly resistant to the most common desulfurization procedures. Legislation around the sulfur content of fossil fuels is becoming stricter, driving the need to find improved desulfurization methods. Biodesulfurization is a natural process found in *Rhodococcus erythropolis* that effectively removes sulfur from dibenzothiophenes (DBT's) through an enzymatic pathway, the 4S pathway, that employs 4 different enzymes that oxidize and remove sulfur from DBT. The main limitation on the industrial application of Biodesulfurization is the overall rate of the 4S pathway. DszB is the final enzyme of the pathway and it is responsible for breaking the C-S bond of 2-hydroxy-biphenylsulfinate (HBPS).

In this work we study the catalytic mechanism by which DszB removes sulfur from DBT and also the influence of different reactant conformations of the active site on the reaction profile, using Quantum Mechanics/ Molecular Mechanics and Molecular Dynamics.

It was possible to see the formation of a sulfanion hole structure during the TS and first stable intermediate, in which the Cys27 thiolate is stabilized by both His60 and Gly73. The $\Delta G^\ddagger$ and ΔG_r were calculated with B3LYP 6-311+G(2d,2p):Amber level of theory and the obtained values were of 18.0 kcal.mol⁻¹ and 8.8 kcal.mol⁻¹, respectively.

Also, two main subsets of active site conformations were submitted to QM/MM: one of them presented $\Delta E^\ddagger$ values between 20 and 32 kcal.mol⁻¹ and the other had $\Delta E^\ddagger$ values higher than 40 kcal.mol⁻¹. This last subset evidenced an inversion of the rotamer of Cys27, the catalytic residue, making these conformations unable to perform the reaction.

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- **15276 | Effect of gender and sexual orientation in parental self-efficacy**

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Both gender and sexual orientation affect parenthood which is still seen as a feminine and heterosexual endeavor. In the case of sexual minority individuals, recent social and legal changes in Portugal, namely those regarding same-sex adoption and assisted reproduction techniques have facilitated these individuals' access to parenthood. Parental self-efficacy is defined as a sense of efficiency and competence in one's parental experiences and individuals with high parental self-efficacy perform parenting tasks efficiently. In this study, we set out to explore the perceptions of parental self-efficacy of 94 Portuguese parents (47 identified themselves as lesbians, gay men, and bisexuals (LGB) and 47 as heterosexuals) in function of sexual orientation and gender. Overall, participants showed a high level of self-efficacy but no significant differences were observed in function of gender and sexual orientation. Results are in line with comparative research with different-sex and same-sex parents which has observed more similarities than differences between these two groups.

Funding Sources: This work was funded by the Center for Psychology at the University of Porto, the Portuguese Science Foundation (FCT UID/PSI/00050/2013) and EU FEDER through the COMPETE 2020 program (POCI-01-0145-FEDER-007294).

- **15277 | Diclofenac detoxification in tomato plants - glutathione metabolism and the role of specific glutathione-S-transferases**

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Environmental contamination with pharmaceuticals is a growing topic of concern, as these compounds pose a threat to various organisms even in low concentrations. Therefore, due to the sessile nature of plants and their importance in the ecosystem, it is important to understand how they can affect and be affected by the environmental changes they are exposed to. In this work, tomato plants were grown under different concentrations of diclofenac (DCF; 0.5 mg L⁻¹ and 5 mg L⁻¹), as it is one of the most common compounds found in contaminated waters, with negative effects to surrounding lifeforms already documented and mediatized. The starting point was to describe the plant-contaminant interaction, showing that tomato plants are involved in the removal of DCF from the growth medium, but no DCF was detected in the fruits, indicating a prior metabolism. In this sense, both biochemical and molecular approaches were utilized to understand the intrinsic mechanisms that DCF exposure would induce in this crop, focusing on the role of glutathione (GSH)-related enzymes in this response. This approach was the result of bibliographic data documenting GSH-DCF conjugates in other plants, and the results obtained in the present work corroborate that hypothesis, since the reduction in free GSH levels was accompanied by an increase of glutathione-S-transferase (GST) activity, the enzyme responsible for catalyzing this conjugation. Furthermore, the conjugation process appears to occur at the root level, focusing on the regeneration and translocation of existing GSH rather than de novo synthesis. However, the main contribution towards the current state of the art is the analysis of specific GSTs in the detoxification process. Here, the results show a clear DCF-induced accumulation of tau GSTs for both tested concentrations, while a qPCR analysis pointed towards the importance of genes from the phi class of GSTs (GSTF4 and GSTF5) when plants are exposed to the highest DCF concentration.

- **15278 | Genetic affinity applied to the determination of the geographic origin of wolf individuals**

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Throughout 2016 and 2017, wolf (*Canis lupus*, Lineu, 1758) corpses appeared in several places of Asturias, in some cases only heads or parts of the body, exposed in public places (e.g. hanging on road signs or bridges). These events alarmed the local populations and may result from the social conflict involving wolf presence and livestock breeders. Local authorities have been trying to determine the spatial origin of these individuals.

In this work, we applied genetic identification and affinity to trace the geographic origin of 13 individuals. We used molecular markers (microsatellites), geographic information tools and a database of samples of wolves from Asturias, collected over the last 20 years.

Results are relevant for the management of this wolf population and may constitute a management tool for the local authorities.

- **15279 | Unraveling the mechanisms of α -amanitin toxicity in HepG2 cells**

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Amanita phalloides is one of the most poisonous mushrooms, and amatoxins, specially α -amanitin, are responsible for its major deleterious effects. Until now, there is no effective procedure or antidote for *Amanita phalloides* intoxications. The liver is a major target for α -amanitin toxicity, thus it is crucial to identify the mechanisms of α -amanitin hepatotoxicity and search for effective antidotes.

α -Amanitin cytotoxicity was evaluated in HepG2 cells following incubation for 24 or 48h with the MTT reduction and neutral red uptake assays. The effect of α -amanitin in the production of reactive species, total glutathione levels, mitochondrial membrane potential (MMP) and in ATP levels was assessed 24h after incubation. Additionally, the effect of buthionine sulfoximine, an inhibitor of γ -glutamylcysteine synthetase, and the effect of previously identified antidotes for amatoxin-intoxicated patients but with low clinical efficiency such as N-acetylcysteine, silibinin and benzylpenicillin was evaluated towards α -amanitin cytotoxicity following a 48h incubation.

α -Amanitin caused a concentration and time dependent mitochondrial and lysosomal dysfunction. While this amatoxin (2 or 5 μ M) did not induce changes in MMP, α -amanitin 5 μ M caused a significant increase in intracellular ATP levels. α -Amanitin (1, 2 or 5 μ M) did not induce changes in reactive species production but α -amanitin 2 and 5 μ M caused a tendency to increase total glutathione levels. Buthionine sulfoximine caused a partial protection to the impairment caused by α -amanitin 5 μ M in the MTT reduction assay. However, none of the clinically used antidotes conferred protection against α -amanitin cytotoxicity, thus better antidotal strategies must be investigated.

VMC thanks FCT for grant (SFRH/BPD/110001/2015). Work supported by FEDER funds through the Operational Programme for Competitiveness Factors – COMPETE and by national funds by FCT (PTDC/DTP-FTO/4973/2014– POCI-01-0145-FEDER- 016545).

- **15280 | Self-esteem Among Lesbian, Gay, Bisexual, Trans and Intersex Students in Portuguese Schools**

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Discrimination and prejudice against lesbian, gay, bisexual, trans and intersex (LGBTI) adolescents is common and plays a major influence in these individual's psychological adjustment. The aim of this study is to assess the self-esteem of self-identified LGBTI students in function of specific aspects of their sexual identity: sex, gender identity, sexual orientation and gender expression. A sample of adolescents (N = 693) between ages of 14 and 20, attending school in Portugal during 2016-2017 that identified themselves as LGBTI answered an online questionnaire about their experiences in school during the last school year. Data were analyzed using t-tests and ANOVAs. In regards to sex, results show that self-esteem was higher among males than females. Concerning gender identity, cisgender individuals reported higher levels of self-esteem than their transgender peers. In terms of sexual orientation, gay male students showed the highest levels of self-esteem when compared to the other groups (bisexual males, lesbians and bisexual females). Finally, regarding gender expression, "masculine" males evidenced the highest scores of self-esteem. Overall, results show that being male is protective of students' self-esteem, independently of their sexual orientation and their gender expression. Results are discussed taking into account literature about self-esteem during this life stage and hegemonic masculinity theories. Implications are then drawn for bullying prevention interventions and policies.

- **15281 | *Opuntia ficus-indica* (L.) Miller fruit from Portugal: alternative crops and food security**

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The search for plant species to develop sustainable agriculture is nowadays a challenge. Opuntias (Cactus), once invasive species, are now part of the natural landscape and the agricultural systems of many regions [1]. Opuntia products (palm, flowers and fruits) are used for food, forage, energy, folk medicine, cosmetic and agronomic purposes, contributing to the food security.

For those reasons, in this study it was evaluated the nutritional composition of Opuntia fruits cultivated and provided by a local producer in Torres Novas (Portugal). Samples were divided according to their inherent colour (red, yellow and green).

The three fruits showed interesting nutritional profiles, determined by AOAC methods [2].

In general, the fruits presented low fat content, being observed a greater value for the red figs (1.5 g/100 g dw). Total protein content ranged between 4.9 and 6.4 g/100 g dw in yellow and red, respectively. In turn, the yellow fruit contained higher levels of total minerals (4.19 g/100 g dw), while the green fruit were the richest in total dietary fiber (29.6 g/100 g dw).

These results could be relevant to better understanding the nutritional composition of these fruits, and promote its valorization as well as further applications.

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Acknowledgments: The authors thank to Paulo Costa, for kindly providing the samples.

- **15282 | PHOTOCATALYTIC REFORMING OF BENZYL ALCOHOL OVER METAL-LOADED g-CN: CAN SYNTHESIS BE SUSTAINABLE?**

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In this work, several graphitic carbon nitride (gCN) based photocatalysts were synthesized and tested in the photocatalytic reforming of benzyl alcohol (BA) into hydrogen and benzaldehyde (BAL), a base compound in pharmaceutical, cosmetic and food industry. The objective of this work was to understand the influence of different metals loaded on bulk (gCN) and thermally exfoliated (gCN-T) carbon nitride, in the photoactivity of the resulting materials. Combining the production of a given chemical with the generation of a potential fuel can bring the synthetic industry to a totally different level of sophistication. Hydrogen production by environmental friendly technologies is nowadays becoming more accessible [1].

The photocatalytic experiments were conducted in a borosilicate glass reactor, using a four LED system as a radiation source. The production of hydrogen was evaluated by gas chromatography and the formation of BAL by high-performance liquid chromatography. The photocatalyst characterization was investigated by transmission electron microscopy, diffuse reflectance UV-Vis spectroscopy and photoluminescence spectroscopy.

The results showed that the deposition of noble metals over both gCN and gCN-T enhanced the efficiency of the materials. The most efficient photocatalysts were the materials loaded with Pt and Au particles.

The higher performance of the gCN-T materials may be rationalized in terms of a more pronounced separation of the carbon nitride layers, which resulted in a higher surface area. The performance of the metal-loaded materials appeared to be related to the size of the metal nanoparticles and to their dispersion over the support.

Acknowledgements:

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- **15283 | Multiferroic SrMnGe₂O₆ and CaMnGe₂O₆ - A Local Probe Study**

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Multiferroic materials have been under the spotlight due to their scientific and potential application interest. Among these interesting materials are the group of compounds belonging to the Pyroxene family with general chemical formula $AM(Si, Ge)_2O_6$. More specifically, $SrMnGe_2O_6$ and $CaMnGe_2O_6$ are isostructural, crystallizing with monoclinic $C2/c$ symmetry and are characterized by zigzag chains of MnO_6 octahedra linked by edge-sharing, separated by GeO_4 tetrahedra chains along the same axis, linked by corner-sharing. Due to this arrangement these systems present a rich diversity of low-dimensional magnetic properties. The existence and possible interplay of low dimensionality and magnetic frustration results in multiferroic and/or magnetoelectric properties.

Since these properties might arise from local structural features that are not well described by methods based on long-range average structural models, the use of local probe studies is essential. In this context, hyperfine methods, such as perturbed angular correlation (PAC) spectroscopy where the study of the electric field gradient (EFG) in the vicinity of a probe atom, allows reconstructing of the local environment of the probe in the material, helps to clarify the origin of the properties exhibited in these systems. In this work a temperature dependent EFG study will be presented and discussed, guided by EFG simulation results, attempting to clarify the experimental observation of two different local environment for the ^{111}mCd probes in $SrMnGe_2O_6$, as opposed to only one in $CaMnGe_2O_6$, even though these materials are isostructural. Initial results from simulations of the electric field gradient main component and asymmetry parameter (η) will be correlated with experimental data. While the results from η are suggestive of the probes occupying both Sr and Ge lattice sites in $SrMnGe_2O_6$, some discrepancy still exists. Thus, the use of more complex models to improve the results will be discussed.

- **15284 | Glowing in the dark: a phosphorescent oil with long lasting phosphors**

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Photoluminescent inorganic materials have been widely studied because of their promising industrial applications, being the strontium aluminates (SrAl_xO_y) host doped with europium ($\text{Eu}^{+2,+3}$) and dysprosium (Dy^{+3}) one of the better examples since their stability and long-lasting luminescent [1]. However, to obtain optimal final properties and make a synthetic method easily scalable, some research is still needed.

We are focused in the preparation of coatings that provide emission of light without any electric source. Our team developed a wood oil with phosphorescent pigments very successfully before [2]. Herein, we present our latest advances in the preparation of phosphors and a comparison with the commercial reference powder. These products will provide phosphorescent properties with an improvement of the emission intensity in time and efficiency.

Acknowledgements:

This work was co-funded by European Structural and Investment Funds in the FEDER component, through the Operational Competitiveness and Internationalization Programme (COMPETE 2020) Project No. 23910 "Night Vision".

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- 15285 | Enantiomeric profiling of chiral psychoactive drugs and β -blockers in wastewater

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The use of illicit drugs and the abusive use of pharmaceuticals have increased worldwide. After consumption, parent compounds and metabolites are mainly excreted in the urine, reaching the sewage system [1]. As many of these substances are chiral, quantification of the enantiomers is essential for wastewater-based epidemiology (WBE), since it can provide: information regarding the existence of chiral pharmaceuticals and illicit drugs in the environment; estimation of their consumption in a specific area/community; distinction of different traffic routes and synthesis processes; monitorization patterns of drug consumption; distinction between licit and illicit use of drugs; differentiation between consumption and disposal of unused drugs [1].

The aims of this work were the development and validation of a gas chromatography–mass spectrometry (GC-MS) method for enantiomeric quantification of 11 chiral substances (psychoactive drugs and β -blockers), using (*R*)-(–)- α -Methoxy- α -(trifluoromethyl)phenylacetyl chloride ((*R*)-MTPA-Cl) as chiral derivatization reagent. The method was applied to a WWTP untreated water during a seven-day period. The enantiomeric fraction (EF) allowed the evaluation trends in illicit drugs and pharmaceuticals use in the context of their consumption vs direct disposal as well as their synthetic production routes.

Partially supported by the Strategic Funding UID/Multi/04423/2013 through national funds of FCT – Foundation for Science and Technology and European Regional Development Fund (ERDF) (PT2020) and BIOENVIROM-CESPU-2018. Sara C. Cunha acknowledges FCT for the IF/01616/2015 contract. Sara C. Cunha and J. Fernandes thanks to FEDER funds (POCI/01/0145/FEDER/007265) and National Funds (FCT/MEC (Ministério da Educação e Ciência) under the Partnership Agreement PT2020 UID/QUI/50006/2013.

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- **15289 | Market Allocation of Autonomous Vehicles**

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Throughout history, transportation of goods and people has been critical to the sustained economic growth. Improvements in transports enable agglomeration and the use of economies of scale and scope, decrease costs to obtain input materials, expand potential markets and regions can specialize in the activities where they possess a comparative advantage (Ricardo, 1817). These improvements also decrease the unitary cost of R&D by facilitating the diffusion of innovations (e.g., IMF, 2018).

In the near future, the introduction of autonomous vehicles, AV, (e.g., the Waymo), although, in qualitative terms, comparable to a normal taxi service, on economic terms it will be an important innovation due to the substantial cost reduction of the vehicle when circulating "empty" and while in waiting mode (e.g., a 5km taxi ride price is 15EUR in NY, 21,5EUR in London, 11,5EUR in Paris and 5,60EUR in Lisbon that compares with 1EUR cost for a car without driver).

Assuming a city with tens of thousands of AVs and hundreds of thousands of passengers, the allocation process, similar to the travelling salesman problem, is impossible to do because it is a NP-hard problem and consumers have private information (the reservation price and the cost of waiting). Then, we explore the use of a real time asking auction similar to Lam (2015) where, first, the consumer communicates to all AVs a ride request, then, each AV calculates the proposal that replies to the consumer and, finally, the consumer chooses the AV with the lowest price corrected by the waiting time.

Implementing an agent base market we observe that prices decrease with competition approaching the marginal cost of production which indicates that a real time asking auction is able to allocate the cars to the passengers efficiently.

As final note, no one knows the future and it can also happen that the future of transportation will be e-scooters and e-bicycles.

- 15290 | Fake news and fact-checking: an analysis in the light of journalistic sources theories

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Fake news has become a huge problem for democracies and for the journalism across the world. This expression, contested by many investigators, became popular in 2016 when rumors and fake information reached an enormous number of people by the moment USA held their presidential election, from which Donald Trump came out victorious. In the same year, 2016, Brexit was another event in which fake news were an important part of the process. Once again, in 2018, Brazil's presidential election was flooded with false content, mostly spread by social media such as Whatsapp and Facebook. Brazilian journalists and national media began, then, to work against misinformation and fact-check this fake news. The search for building the truth in news leads to a pursuit for a diversity of sources of information - that can be an official source, a spokesperson for non-governmental organizations, a journalist, a confidential source. Without sources, there are no news, says Manuel Carlos Chaparro (1996). So which information sources are used to build a false story and which ones are used to debunk a fake news? To search for this answer, we're analyzing the debunking news published in "Fato ou Fake", the Globo Group fact-checking service, an section that took place in all news websites from the organization, for the 35 days period of brazilian electoral campaign, from August to October of 2018. The research includes a quantitative approach and a qualitative study, through content analysis, of the sources used in the fake news and in the debunkings produced by the fact-checkers. In this article, we also investigate the literature available on the source theories in the Communication Studies field.

- **15293 | Understanding the Role Video Games may play in the Future of Journalism**
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This research argues that video games can contribute to the future of journalism. We live in the age of distractions, as the number 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, we highlight one platform that excels at retaining the attention of its users, whilst telling stories: video games. To understand how they do this, and if they can contribute to journalism, we examined the literature on game design and narrative and we found that games keep people's focus using, mainly, three principles. 1- games use techniques derived from behaviorism to give rewards to players when they reach certain milestones; 2- games hit the three pillars of the Self-Determination Theory, which argues that, for an activity to be as engaging as possible, it must offer three things: purpose, mastery, and relatedness; 3- games excel at putting players in a state of "flow," the maximum level of engagement an activity can offer, by providing clear goals and immediate feedback. In addition, games also have unique narrative techniques, such as procedural rhetoric, dialogue trees, and environmental storytelling. With these elements, games tell stories while retaining the attention of players. Therefore, our argument is that it might be useful for journalists to take into consideration some of the video games techniques to share journalistic stories, as this platform can help to build the future of journalism, by sharing narratives in an engaging way, which is crucial in the age of distractions. The work presented in this proposal became a chapter of the book "Enfim, Jornalista" and was published by the University of Waterloo, Canada, through its project "First Person Scholar."

- **15298 | Low caloric intake, from adolescence into adulthood: effect on insulin sensitivity and cardiometabolic risk factors**

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Caloric restriction has been intensely studied as it seems to increase lifespan and delay diseases onset in rodents and short-lived species. Although the effects in humans are years away from being well established, caloric restriction has also been associated with improved cardiometabolic risk factors, either in non-human and in human primates. However, available data are based on studies with too short period of follow-up and very restrictive diets.

We aim to evaluate, in a longitudinal study from 13 to 21-years-old, how the adherence to a dietary pattern characterized by a lower intake affects cardiometabolic risk factors.

The study was based on data from the 962 participants on the EPITeen cohort with valid dietary information at 13y and at 21y. At both waves diet was evaluated by a food frequency questionnaire. Body mass index, blood pressure, insulin, triglycerides and glucose were assessed at both waves. Metabolic syndrome features will be defined according to the National Cholesterol Education Program Adult Treatment Panel III definition and the Homeostatic Model Assessment for Insulin Resistance will be used to assess insulin resistance.

At 13y four dietary patterns were identified: Healthier (n=239), Dairy products (n=442), Fast food&Sweets (n=212) and Lower intake (n=596). The dietary patterns found at 13 seem to be predictor of the dietary patterns found at 21, although the differences between patterns are more tenuous. The mean (standard deviation) energy intake (kcal/day) of those in the Lower intake pattern was 1812 (378,3) at 13y and 2163 (616,5) at 21y. Statistically lower than the energy intake reported by those in the healthier pattern, 33.5% and 7.8% lower, at 13 and at 21, respectively.

Although the restriction in energy intake among those in the Lower intake group was not as expressive as in experimental studies it seems to be constant over the years. So, we expect to find a better cardiometabolic profile among those in the Lower intake pattern.

- **15301 | Illegal Wildlife Trafficking: An Overview of the Phenomenon**

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The current work serves as a review of some of the empirical research that has been done in the last decades regarding the illegal wildlife trafficking. This type of crime should receive more attention from the scientific community as it currently is, according to the literature, the second largest market of all types of transnational criminality and one of the most lucrative. The works of authors such as Warchol's (2004) *The Transnational Illegal Wildlife Trade* and Pires & Clarke's (2012) *Are Parrots CRAVED? An Analysis of Parrot Poaching in Mexico* are analyzed in order to understand how this phenomenon is widespread globally and what its implications are. Environmental concerns are raised due to its significant impacts in both animal and human populations, such as the near extinction of some species and the loss of biodiversity. While different kinds of animals will be mentioned throughout the study, the focus will be on birds, a choice that was considered due to the ongoing partnership between The Portuguese Association of Bird Study (SPEA) and the School of Criminology - Faculty of Law of the University of Porto. Borrowing from the research of various authors, a profile for the poachers and traffickers is traced and their motivations and methods are described. This information helps to shed a light regarding the nature of this type of crime in order to avoid some misconceptions. The structure of the current work is as follows: 1) Introduction of the concept of illegal wildlife trafficking; 2) Analysis of the empirical research of various authors regarding this topic and the discussion of its results; 3) Presentation of Portuguese legislation regarding this type of crime and the limitations of the study of this issue in this context.

- **15302 | Forecasts of redshift drift constrains on the scale factor**

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The Universe is made of much more than what we can see when we look up at the sky. Understanding this is one of the most important problems in cosmology. Cosmography is an approach to this problem that does not rely upon any assumptions besides large scale homogeneity and isotropy.

In this work I will show the impact of this approach in our knowledge of the derivatives of the scale factor in the present. This will help us understand the expansion of the Universe in the near past. To do this I, used the expected performance of ELT (Extremely Large Telescope) to estimate the uncertainties we can expect for the measurements of the parameters of both Lambda-CDM and CPL.

- **15303 | Geographic Information Systems applied to precision agriculture in the vineyards**

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"In the agriculture sector, Geographic Information Systems have an important role for planning and management at a regional level and in the local scale. Their use in Precision Agriculture systems is crucial, since most of the technologies that underpin these systems require georeferenced information" (Coelho & Silva, 2009).

The objective of this work, essentially, is to understand how Geographic Information Systems (GIS) contribute to improve the efficiency of methods, processes and analysis of geographic data associated with precision agriculture, particularly applied in the vineyards.

Specifically, we are concerned to speed up the data collection with subsequent analyzes in GIS, interpretation and analysis of geographical patterns that the field data reveal about the precision farming processes during the harvest. It also aims to relate field data and interpreted patterns with other relevant geographic information, such as satellite data (Landsat and Sentinel), for example, the parameter NDVI (Normalized Difference Vegetation Index).

In the development of the work, it was essential to analyse interpolation results that allowed the use of points with known values of grapes harvest to estimate values for the area where the points are distributed. This procedure allows us to understand in which area the harvest was more and less productive.

Through the analysis of the NDVI vegetation index, it is verified that there is a significant variability of the patterns in the values throughout the vegetative period of the grapevine.

"The increase in the competitiveness of the vineyard sector is fundamental for the evolution of this agriculture branch. The dispute arises from the reduction of production costs and the increase in value of the final product, which mainly goes through the improvement of quality " (Braga, 2009).

- **15308 | A possible application of CO-releasing molecules in the treatment of rheumatoid arthritis**

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Rheumatoid arthritis (RA) is an inflammatory condition characterized by synovial inflammation. [1] While notable advances have been made in the treatment of RA, long-term administration of antirheumatic drugs still has some disadvantages. [2] Currently, carbon monoxide (CO) is known to have anti-inflammatory effects *in situ*, however, administration of this molecule presents a challenge and the development of a technology that controls the release of CO under different pathophysiological conditions represents an important step in the use of CO-releasing molecules (CORMs). Nanobased delivery systems are being developed to avert non-specific binding by improving the accumulation of drugs in lesion tissues. [3] In this project, we intend to develop a nanosystem that is capable of releasing CORMs in a controlled and targeted to be further used in the treatment of rheumatoid arthritis.

Lipid nanoparticles loaded with CORM-2 have been developed. The formulations have been physico-chemically characterized regarding their size, zeta potential, payload and surface modification efficiency. *In vitro* release studies and permeation studies with Franz cells were performed to study the best form of administration of the formulations developed. In addition, *in vitro* cell toxicity and anti-inflammatory response studies are being conducted using the THP1 cell line.

Acknowledgments:

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- **15311 | FROM FANDOM TO FAD: ARE MILLENNIALS REALLY ENGAGED WITH AND LOYAL TO THEIR LOVED BRANDS ON SOCIAL MEDIA?**

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The Millennial generation exerts a peculiar fascination on both managers and academics. Millennials can be distinguished from other cohorts in their intense exposure to the Internet and heavy use of social media platforms, which affects their identity formation, brand engagement, loyalty and purchase behaviour. Yet, the way Millennials engage with brands in social media is an area meriting more research attention. Are they mainly passive observers, or are they actively engaged with and loyal to their loved brands? What are the real benefits brands can reap from Millennials avid use of social media?

In order to answer to these research questions, this study focuses on this generational cohort and develops a holistic model of social media engagement, validated across different social media platforms, that includes brand love, brand experience, self-brand identification/connection as direct and indirect antecedents, and brand loyalty as an outcome. Data was gathered using a self-administered online survey, answered by 343 social media users (all belonging to the Millennium generation), based on self-selected self-expressive, loved brands.

Findings suggest a disconnection between online and offline brand relationships: though Millennials love and are very loyal to their favourite brands, they are not very actively engaged on social media, which helps to explain the non-significant effect of engagement on brand loyalty. Moreover, brand experience was found to play a major role in developing brand love, which in turn is positively related with engagement and loyalty.

Theoretically, this study contributes to bridge a gap in the literature, since research on engagement, its drivers and outcomes is scant, and there is no robust evidence about its impact on brand loyalty, particularly among Millennials. Managerially, this study provides insights to brand managers who wish to successfully use social media to stimulate engagement and build relationships with Millennials.

- **15313 | Determination of antibiotics in water using digital image colorimetry**

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Antibiotics are widely used worldwide, however, they are not fully metabolized and they are discarded incorrectly, leading to their accumulation in the environment. This contributes to the development of antibiotic resistance, representing a serious public health problem [1]. The main goal of this work was to develop a low-cost smart-phone based analytical methodology for in-situ screening of antibiotic contamination in environmental water, using sulfonamides as model compounds. The method is based on the preconcentration of sulfonamides in solid-phase extraction membranes, followed by addition of a color reagent that allows color development proportional to the amount of retained sulfonamides. Quantification is performed using an automatic image processing algorithm.

Commercially available membrane disks for the solid-phase extraction procedure were tested. Polystyrene divinylbenzene sulfonated disks were selected due to their higher efficiency for sulfonamides retention. After preliminary studies, the color developing reagent 4-dimethylaminocinnamaldehyde showed the best sensitivity for most of the tested sulfonamides. A protocol for sulfonamides retention, color development and image acquisition was implemented, and the image processing algorithm was tested for the detection of different sulfonamides (sulfamethoxazole, sulfadiazine, sulfamethazine, and sulfadimethoxine). The use of different sample volumes was also tested, aiming to increase the amount of sulfonamides retained in the disks. Currently, the developed methodology is under validation with real samples. [1] FAO, The FAO Action Plan on Antimicrobial Resistance 2016-2020, Food and Agriculture Organization of The United Nations, Rome, 2016.

Acknowledgments: This work received financial support from the EU (FEDER funds POCI/01/0145/FEDER/007265 and COMPETE POCI-01-0145-FEDER-031756) and National Funds (FCT/MEC) under the Partnership Agreement PT2020 UID/QUI/50006/2013 and project PTDC/CTA-AMB/31756/2017.

- **15314 | Data governance in gamete donation: policy on information sharing among gamete donors and recipients**

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Data governance in gamete donation is concerned with information sharing among stakeholders. In May 2018, the Portuguese Constitutional Court removed anonymity in gamete donation without previous consultation with the stakeholders involved. Examining donors' and recipients' views about information disclosure is crucial to imbue policy with people's needs and preferences. However, in Portugal, there is a shortage of studies on this subject. This study aims to produce evidence to inform the development of people-centred policy for data governance in gamete donation by assessing donors and recipients' willingness to access and share information related to donor-assisted reproduction.

Between July 2017 and April 2018, 69 donors and 161 recipients (participation rate: 77.4%) completed a self-report structured questionnaire at the Portuguese Public Bank of Gametes. Descriptive statistics were used to analyse opinions about access to basic, medical, extended profile and identifying information about recipients, donors and children.

Most participants considered that recipients should not have access to donors' identifying information and extended profile information (e.g. education), in contrast with the tendency to agree with their access to donors' medical information. More than 80% of participants disagreed with donors' access to recipients' medical and extended profile information and children's identifying information. In comparison with recipients, donors stated more frequently that they should receive basic information about the outcomes of donation (e.g. pregnancies and births). This study points to the need to recognise basic information as a vehicle for enabling reciprocity between recipients and donors. A matching mechanism (via consent) and counselling services are necessary to accommodate both stakeholders' preferences regarding donors' access to basic information and to assist stakeholders in decision-making concerned with information sharing.

- **15316 | Newly synthesized xanthenes as potential P-glycoprotein modulators at the intestinal barrier: in vitro and ex vivo studies**

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P-glycoprotein (P-gp) is an ABC efflux pump with an ubiquitous and constitutive distribution throughout the body, with major relevance in normal human epithelial tissues. P-gp is also involved in the development of multidrug resistance in anticancer therapy, given its overexpression in tumor cells. Due to its wide distribution, with a polarized expression in barrier/excretory tissues, to its wide range of substrates and to its large efflux capacity, P-gp has an outstanding impact in the pharmacokinetics of xenobiotics. This mechanism is particularly important at the intestinal level, reducing the intestinal absorption of xenobiotics, limiting their access to the target organs and decreasing their toxicity.

The aim of the present study was to investigate the potential effect of 6 newly synthesized xanthenes on P-gp expression/activity. In vitro studies were performed in SW480 cells and some xanthenes were able to significantly increase P-gp expression and activity. The most promising compound was tested for its ability to increase P-gp activity ex vivo, using rat everted intestinal sacs and rhodamine123 (RHO123) as a fluorescent substrate. A significant increase in RHO123 efflux was observed in the presence of X12, an effect selectively blocked by zosuquidar, a third-generation P-gp inhibitor. Therefore, the obtained results demonstrated P-gp involvement in the increased RHO123 efflux, confirming the in vitro results concerning the X12 P-gp activation potential.

The protection afforded by the xanthenes against the cytotoxicity induced by mitoxantrone (MTX), a toxic P-gp substrate, was also explored in SW480 cells. However, despite the P-gp activation potential, the xanthenes failed to protect against MTX-induced cytotoxicity.

Taken together, the obtained in vitro and ex vivo results suggested the P-gp activation potential of the tested xanthenes and highlighted a potential source of new P-gp inducers and activators.

- **15317 | Supplement trends: are curcumin and resveratrol good for fertility?**

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With the pursuit of a healthy lifestyle, dietary supplements including antioxidants are earning more attention by the scientific community. Antioxidants are synthetic or natural substances that may prevent or delay cell damage and have been described as beneficial for a wide range of illnesses and chronic diseases. Resveratrol and Curcumin, two of the bestselling antioxidants, are sold as dietary supplements that benefit fertility. However, there is a lack of scientific support. Therefore, in this work, we tested the effects of these compounds in granulosa cells (GCs). GCs have a major role in the production of estradiol and progesterone, among other factors that significantly influence the reproductive cycle of women and, indirectly, interfere with oocyte quality and reproductive success. To understand the impact of Resveratrol (0,001-200 μ M) and Curcumin (0.001-50 μ M) on folliculogenesis, we used COV434 granulosa cell line. Viability and cytotoxicity were evaluated by MTT assay and LDH release, respectively, after 24, 48 and 72 hours of treatment. Cell morphology was accessed by phase contrast microscopy, giemsa and höechst staining. ROS production was evaluated using a fluorescent probe (DCDHF-DA), whereas mitochondrial membrane potential was studied by fluorometry assay (DioC6 probe). Both compounds induced a reduction in granulosa cells viability, in a concentration and time-dependent manner. After 72 hours, cells treated with resveratrol 5 μ M dropped 26%. On the other hand, COV434 cells presented a decrease of 24% after 48 hours of curcumin exposure. Surprisingly, there were no significant differences in ROS production. Higher concentrations of either resveratrol or curcumin induced a more pronounced reduction on cell viability, though these effects were accompanied by LDH release and dramatic morphological alterations. Further studies will explore the mechanism of cell death and the antioxidant potential of both compounds.

- **15319 | Newly synthesized xanthonic derivatives as potential P-glycoprotein modulators: a strategy to fight Alzheimer's disease**

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P-glycoprotein (P-gp) is a well-known ATP-dependent efflux pump that, apart from its relevance in the development of multidrug resistance in neoplastic cells, was also found to be constitutively expressed in normal human epithelial tissues. Furthermore, given its great efflux capacity associated with its broad substrate specificity and its cellular polarized expression in many excretory and barrier tissues (e.g. Blood-Brain Barrier), it plays a vital role in the protection of susceptible organs, by significantly reducing the absorption and distribution of harmful xenobiotics, as well as endogenous substrates such as amyloid beta (A β) peptide, reducing their intracellular accumulation and, consequently, their toxicity. Indeed, this protein can be considered as a potential disease-modifying pathway when activated and/or induced, in several pathologies/diseases, such as Alzheimer's disease (AD).

Knowing that xanthenes are a group reported to interact with P-gp, the key goal of this work was to evaluate the induction or/and activation potential of six newly synthesized xanthonic derivatives in the hCMEC/D3 cell line. Furthermore, the neuroprotective effect of the most promising xanthone against the A β -induced cytotoxicity was also assessed.

The newly synthesized xanthonic derivatives demonstrated to interact with P-gp, leading to an increase in P-gp expression (xanthenes X4, X7, X8, X9 and X17) and transport activity (xanthenes X7, X9 and X13) 24 hours after the incubation, and after a short incubation period of 90 minutes (X7, X9, X13 and X17), indicating not only P-gp induction, as well as a direct pump activation. Additionally, xanthone X7 significantly protected hCMEC/D3 cells against the cytotoxic effect induced by the A β peptide (pathological hallmark of AD), being this neuroprotective effect associated with P-gp.

Therefore, P-gp positive modulation, by increasing the efflux of A β peptide, can be faced as a potential prevention/treatment therapeutic approach in AD.

- 15320 | Synthesis of amino-functionalized porphyrin macrocycles

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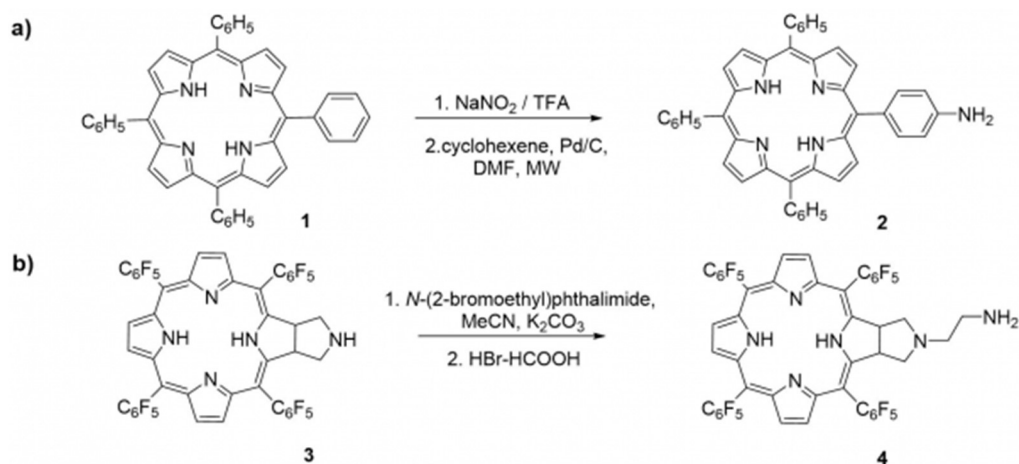
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Photodynamic therapy (PDT), involving the combination of a photosensitizer (PS), visible light and molecular oxygen, is an efficient therapeutic approach for fighting various tumors. Currently, medicinal formulations already include porphyrin macrocycles as PSs, however most of these drugs exhibit poor water solubility, poor tumor selectivity, and have as side effect light sensitivity after treatment [1]. Herein we describe our latest results involving the synthesis of two amino functionalized porphyrin macrocycles: (a) the amino-aryl porphyrin, obtained by nitration of meso-tetraphenylporphyrin and subsequent reduction using the microwave-assisted catalytic transfer hydrogenation method and (b) the amino-alkyl chlorin, resulting from N-alkylation of pyrrolidine-fused chlorin with N-(2-bromoethyl)phthalimide, followed by acid hydrolysis. Short reaction times and simple procedures make these methods very promising, while providing the efficient synthesis of amino derivatives useful for future modifications, aiming to obtain new macrocycles with potential applications in PDT [2].

Acknowledgements: The authors gratefully acknowledge the COST action CM1302 (SIPs) and the "Cooperação Científica e Tecnológica FCT/DAAD-2017/2018" through the project "Novel ligand-porphyrin conjugates for targeted photodynamic therapy of cancer". The work was financed by European Union, FEDER (Fundo Europeu de Desenvolvimento Regional) through PT2020 and by national funds through the FCT (Fundação para a Ciência e a Tecnologia), QREN, and COMPETE, NORTE-07-0162-FEDER-000048, UID/QUI/50006/2013 (LAQV/REQUIMTE).

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Reactions involved in the synthesis of amino-functionalized porphyrin macrocycles

- **15325 | Using field hyperspectral-spectrometry and pigment's concentration to determine predawn leaf water potential in Douro Region**

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In the last decades, vineyards' irrigation has been considered for stabilizing both grape production and quality. The predawn leaf water potential (ψ_{pd}) is still widely used for grapevine water status assessment. We successfully calibrated and validated a predictive model for ψ_{pd} in a commercial vineyard (SOGRAPE) of the Douro Wine Region. Hyperspectral data and leaf pigments concentration coupled with several machine learning regression algorithms (MLRA) were used for modelling ψ_{pd} . A handheld spectroradiometer (400-1010 nm) was used to collect the foliar hyperspectral information in different points in four different dates of 2018. Also, a leaf of each point was collected to assess the concentration of Carotenoids, Lutein, Chlorophyll (Chl) a, Chl b, Chl ab and foliar water status (TAF). The dataset was randomly split in two sub-datasets for calibration (70%) and validation (30%). Through a Spearman correlation (threshold of 0.7) and the application of ten distinct MLRA, the ψ_{pd} was estimated by the concentrations of Lutein per dry matter (LUT.MS) and of Chl a per dry matter (Ca.MS), TAF, and a time-dynamic variable of the previous measurement (ψ_{pd_0}). Subsequently, a total of 14 spectral vegetation indices (VI) were optimized to explain the variables selected by the model. A stepwise forward selection was applied to choose the best VIs for the final model used to estimate the ψ_{pd} : NRlgreen_LUT.MS520;532, NRlgreen_TAF540;551 and ψ_{pd_0} . Among 10 MLRA, the B-MARS algorithm performed the best results, with a root mean squared error (RMSE) of 0.57 and 0.68, and a mean absolute error (MAE) of 0.47 and 0.54 for the validation and calibration, respectively (Table 1). This final model is robust due to its low variation and allows the estimation of ψ_{pd} based on physiological parameters. These results point to potential use of approaches based on radiative transfer models, which are considered more robust than MLRA and may be useful for mapping vineyard's ψ_{pd} .

- **15327 | Assessing grapevine water status from hyperspectral signatures using machine learning algorithms: a new framework tested in Douro wine region**

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Irrigation schedules, in vineyards, often rely on eco-physiological indicators of the plant's response to water deficit, such as the predawn leaf water potential (ψ_{pd}). However, this is a time-consuming and labor-intensive technique and new approaches are in order. Spectral data-based methods have been developed for monitoring crops' water status, but their operational applicability still lacks greater knowledge. This project's main goal is to explore the hyperspectral reflectance data's potential to predict vine's water status, aiming to support an efficient irrigation planning.

Measurements of ψ_{pd} and canopy hyperspectral reflectance were carried out in a commercial vineyard (SOGRAPE) of the Douro Wine Region, using a pressure chamber and a handheld spectroradiometer (400 - 1010 nm), both on the same day and grapevine, in 4 dates (3/8, 17/8, 31/8 and 12/9) of 2018. A total of 97 Vegetation Indices (VI) were computed from the hyperspectral data, with the "hsdar" package in R Software. Through a Spearman correlation test ($-0.7 > \rho < 0.7$), the list was narrowed down to 12 non-correlated VI. From the 625 variables tested, including spectral reflectance and VIs, five were selected as predictors through a forward stepwise procedure: a time-dynamic variable based on the ψ_{pd} of the previous measurement (ψ_{pd_0}) and four VI (PRI_C12, SPVI, NPCI and Vogelmann). Several machine learning regression algorithms were tested for predicting the ψ_{pd} , using 70% of the data for calibration and 30% of the data for validation. The algorithm Generalized Boosted Model (GBM) presented the best performance, with low root mean square error (RMSE) for validation, and a small variation for both the mean absolute error (MAE) and RMSE values, between calibration (MAE = 0.426; RMSE = 0.514) and validation (MAE = 0.474; RMSE = 0.596). Model performance could be improved by using structural variables such as the grape varieties, irrigation and leaf pigments and they will be tested in future work.

- **15328 | Microservices in the grid - Highly Scalable Agent Models for Smart Grids Simulation**

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The fusion of innovative technologies for automatic negotiation, prediction, and metering with the capability of injecting small amounts of electricity into the grid gave birth to the term smart grid. Smart grids introduce two-way dialogue, where electricity and information can be exchanged between the utility and its customers. A two-way dialogue allows the customer to place electricity in the grid. As such, a customer can produce electricity and sell it to other parties. Currently, energy markets are regulated through strict rules and customers play a passive role as they can only buy/consume energy. From the moment that customers can also sell energy new markets emerge. The literature calls this environment virtual markets (VM).

The main goal of this work is to model autonomous computational agents that represent the different actors (producers, retailers/brokers, consumers, and prosumers) in this kind of scenarios in order to simulate virtual energy markets and evaluate the performance of the markets under some constraints. The analysis of the market models include: evaluation of existing tariffs and changes in contracts, optimization on energy consumption according to user preferences or even decide how much to buy or sell at any given time based on predictive machine learning models.

Previous efforts in the literature assert that traditional simulation models are not enough because of their low capability to run with a high number of agents. We would like to explore this scenario by running larger populations that could represent more realistic markets. In that sense, microservices will be used as a technological approach for guaranteeing some dissociation between the agent's capabilities and abstract the models from the architecture itself, allowing distributed simulation and high scalability.

- 15329 | The devil is in the details. Should we look closer into entrepreneurs' personality?

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The number of adults involved in early-stage entrepreneurship in Portugal has grown in recent years. In 2010 the prevalence was 4.4% and in 2015 was 9.5%. In 2012, the entrepreneurs' rate on early-stage was 7.7% and Portugal was 7th in 24 innovative-oriented economies.

The present study explores the relationship between entrepreneurship, personality traits, and unethical decision-making, by comparing two independent samples of entrepreneurs and non-entrepreneurs.

Given the hard access to an entrepreneurial sample, we adopted a short self-report questionnaire with a concise measure of the Dark Triad of Personality and we designed a short unethical behavior scale. The final sample was composed of 141 individuals.

Entrepreneurs revealed more tolerance towards unethical behavior than non-entrepreneurs. Plus, there were significant differences in the prevalence of Dark Triad traits between entrepreneurs and non-entrepreneurs. Our conclusion raises several questions about the social and economic value that some nascent entrepreneurs intend to produce and the desirable dark traits that will predict the success of the startup.

- **15330 | Antinutrient content and food security: the case of *Vicia narbonensis* L.**

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Food is one of the basic supports of the human condition, being their excess or lack related to disease development. Due to the worldwide increasing population, the imbalance in food production associated to the climate changes may result in a possible, future food shortage. The global management of agricultural production, as well as the adoption of alternative, sustainable and resilient crops are required for world food supply. [1]

Vicia narbonensis L. is an example of easy and inexpensive growing legume, adapted to dry and cold climates, and not requiring phytosanitary treatments. From a nutritional perspective their seeds are high in protein, resulting in a good source for human and/or animal feed. [2] Nevertheless the presence of an antinutrient, the dipeptidyl-glutamyl-S-ethenylcysteine (GEC) may limit their use as a food source.

The goal of our work was to identify GEC in different plant parts (leaves, pod and seeds) from several accessions (n=7). GEC detection was monitored by reverse phase HPLC-DAD as a single peak eluted at 215 nm. Accessions of *V. narbonensis* were provided by germplasm plant bank/genetic resources center (INIA). Seeds with high levels of GEC were used as positive control and *V. faba* (leaves, pod and seeds) as negative control. According to our results, the seeds were the richest components, ranging from 45% to 193%. However, for one accession of pods no GEC was observed and for the other six samples it ranged from 22% to 79%. No GEC was detected in leaves of two samples, being the range of other 5 accessions between 2% and 6%, suggesting the possible use of leaves as alternative food source. As future perspective, the identification of a *V. narbonensis* L. accession (all plant parts) with non-toxic levels obtained by natural selection is expected, enabling its use in human food.

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- **15332 | Unravel the role of hypoxia at the tumor microenvironment: a focus on macrophage-cancer cell interplay**

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The tumor microenvironment, which is usually hypoxic, is composed by malignant and non-transformed cells such as fibroblasts, adipocytes, endothelial cells, immune cells and supported by an extracellular matrix, with functional and physical interactions occurring with each other. Macrophages are a major component of this microenvironment and are preferentially recruited to hypoxic areas with several mechanisms described as contributors for tumor progression. Although previous studies described the association of hypoxia and macrophages on tumor progression, there is insufficient information about the influence of hypoxia on macrophage-cancer cell crosstalk.

The aim of this work was to unravel the role of hypoxia on the crosstalk between macrophages and cancer cells, using colorectal cancer (CRC) as a model. Therefore, co-cultures were established with tumor cells and macrophages, in normoxic and hypoxic conditions.

Our results suggest that hypoxia triggers a more pro-inflammatory phenotype on macrophages, along with alterations in macrophages function hallmarks: phagocytosis, antigen presenting capacities, and immune response regulation. Hypoxia and co-cultures induced a decrease on macrophages of SIRP1 α and MHC-II expression, and an increase of CD47, and decrease of PD-L1 expression, on RKO cells. Along with these alterations we found that hypoxia potentiate the macrophage-driven cancer cell invasive phenotype. Our results suggest that hypoxia is a critical feature to have in consideration when studying the tumor microenvironment interactions.

- 15333 | Effects of O₃ on *Platanus x acerifolia* pollen fertility, ROS and NAD(P)H oxidase activity

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Pollen grains are bioaerosols produced by the higher plants during the pollination process. While airborne, pollen can interact with atmospheric pollutants leading to changes in its function.

The aim of this study was to evaluate the effects of ozone in *Platanus x acerifolia* pollen fertility, ROS production and in the NAD(P)H oxidase activity.

Platanus x acerifolia pollen was collected from different branches of trees in the FCUP surrounding area during its flowering. Pollen samples were exposed in vitro for 6 h to O₃ concentrations of half, equal and twice the standard limit value for human health protection according to the European Union Directive 2008/50/EC on ambient air quality and cleaner air for Europe. Pollen viability was determined by FDA test and germination rate was determined using a solid medium containing H₃BO₃, CaCl₂ and sucrose. The ROS detection was evaluated through a fluorescent ROS indicator dye (DCFH₂-DA) and the NAD(P)H oxidase activity was measured using the nitroblue tetrazolium (NBT) assay by spectrophotometry.

Pollen viability and germination rate significantly decreased after exposure to O₃. Also an increase in ROS production was observed although not statistically significant compared with the control sample. Changes in the ROS-generating enzyme NAD(P)H oxidase activity were quantified.

Our results suggest that pollen can be modified by the increasing atmospheric pollution, which can lead to a decrease in its ability to perform its vital task of reproduction with severe consequences in ecosystems balance.

Acknowledgments: National Funds through FCT - Foundation for Science and Technology in the project PTDC/ATP-EAM/0817/2014. Institute of Earth Sciences (ICT) funds, under contract with FCT and FEDER through the Operational Program Competitiveness Factors - COMPETE (UID/GEO/04683/2013 (POCI-01-0145-FEDER-007690)).

- **15334 | Heart rate variability in postural changes**

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The autonomic nervous system (ANS) exerts rigorous control over essential functions of our body. Patients with severe acute brain injury (ABI) may have ANS dysfunction which may aggravate critical illness. Use of tilt-table in early rehabilitation of these patients contributes to neuronal recovery although introducing risks, e.g. orthostatic intolerance.

The aim of this work is to study the modelling of heart rate variability and arterial blood pressure to analyse the relation between the ANS and the interplay between cardiovascular variables and postural changes, using recent methodologies such as described in [1-2, and ref. therein]. In particular, to describe the dynamic complexity of the processes, we extended a parametric framework which exploits the theory of state space models to provide the multiscale representation of ARFIMA processes. This enables a reliable evaluation of multiscale entropy across multiple time scales, incorporating the effects of short-term dynamics and long-range correlations [3].

Physiological time series measured during resting state and postural stress in healthy volunteers and in patients after ABI were analysed. We were able to confirm the relationship between cardiovascular variables and the postural changes induced.

Acknowledgments: Work supported by CMUP, UID/MAT/00144/2019, funded by FCT (Portugal), (MEC, FEDER), under PT2020

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- **15338 | Ozone effects on *Betula pendula* pollen allergenicity**

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Pollen related respiratory allergies affects the life quality of earth inhabitants being a general worldwide health problem. They are associated to an allergic response of susceptible individuals to the airborne pollen of several anemophilous trees. Birch is one of the major pollen-allergen-producer in north, central, and eastern Europe and is starting to be a significant problem in the Mediterranean area due to its popularity as ornamental plant among landscape architects.

In this study we aimed to test the effects of ozone in *Betula pendula* pollen allergenicity.

Male catkins of *Betula pendula* was collected during its flowering and the anthers were dried, gently crushed and the pollen thus released was passed through different grades of sieves. An environmental chamber was used to expose the pollen samples to O₃. This chamber is equipped with temperature and relative humidity sensors and a sunlight simulator. The pollen was exposed for 6 h to three concentration levels, chosen based on the European Union Directive 2008/50/EC of 21 May 2008 on ambient air quality and cleaner air for Europe: half, equal and twice the standard limit value. Pollen soluble proteins were extracted and the polypeptide profiles were determined by SDS-PAGE. The allergenicity was assessed by Western blot and ELISA using sera from patients allergic to birch pollen.

It was observed a qualitative and quantitative differences in IgE reactivity to the protein extracts of the pollen exposed to ozone compared with the non-exposed one. These changes suggest that ozone can induce alterations in the antigenic characteristics of the pollen leading to a allergenicity potency modification.

Acknowledgments: National Funds through FCT - Foundation for Science and Technology in the project PTDC/ATP-EAM/0817/2014. Institute of Earth Sciences (ICT) funds, under contract with FCT and FEDER through the Operational Program Competitiveness Factors - COMPETE (UID/GEO/04683/2013 (POCI-01-0145-FEDER-007690)).

- **15343 | Intronic cis-regulatory elements regulate CDH1 gene expression and function**

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Cis-regulatory elements (CREs) are non-coding DNA regions, capable of integrating different protein signals important for the expression of specific genes in a controlled temporal and spatial manner. Genomic structural variations in CREs may affect gene regulatory networks, explaining certain disease etiologies. In this work, we are studying CDH1, a tumor suppressor gene widely disrupted in epithelial cancers. We aim at unveiling the role of potential intronic CREs (iCREs) in CDH1 expression regulation, since its exonic alterations do not explain all the abnormal CDH1-associated phenotypes.

Bioinformatics analyses on CDH1 mining ENCODE data for chromatin accessibility, epigenetic marks, transcription factor binding sites and other regulatory elements, allowed to identify putative CDH1 iCREs. To ascertain their functional relevance, we edited each iCRE separately in a gastric cancer cell line by using CRISPR-Cas9, as well as CDH1 exon2 as positive control. All engineered cell clones were purified by single-cell sorting and gene editing was confirmed by sequencing. CDH1 expression was assessed by qRT-PCR and a single base primer-extension assay, while E-cadherin expression level and pattern were determined by western blotting and immunocytochemistry, respectively.

We identified two putative iCREs (iCRE1 and iCRE8) of CDH1 and successfully generated homogeneous clonal cell lines with fine-mapped deletions and inversions in clones' DNA sequences. Our results indicate that intronic rearrangements at iCRE1 region impair CDH1/E-cadherin expression, possibly leading to allelic imbalance through the differential binding of transcription factors. Moreover, iCRE1-edited cells can have a similar phenotype to those harboring exon2 deletions. No obvious CDH1 loss of function was detected for iCRE8-edited clones. This study highlights iCRE1 as a CRE of CDH1/E-cadherin expression, supporting a potential involvement of intronic structural variations at CDH1 in disease etiology.

- **15346 | Defining novel stages in medullary thymic epithelial cell differentiation: Implications for tolerance induction**

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Immune-competent T cells are able to respond to a variety of foreign antigens while also being self-tolerant. In the thymus, medullary thymic epithelial cells (mTECs) have a unique role in tolerance induction by presenting tissue-restricted antigens (TRAs). mTEC development is induced by thymocyte-derived signals that activate TNF receptor superfamily (TNFRSF) members in these cells. The mTEC developmental program includes an immature CD80^{low} MHCII^{low} subset (mTEC^{low}) that gives rise to mature CD80^{high} MHCII^{high} cells (mTEC^{high}), including cells that express Aire, an important regulator of TRA expression. Additionally, post-Aire mTECs and CCL21-producing cells are also mTEC^{low}. As such, the mTEC niche encompasses highly diverse subsets, whose lineage and functional relationships remain hard to characterize, mainly due to a lack of suitable markers to define existent subsets and dissect new developmental stages.

Here, by incorporating the study of CD24 and SCA1 expression in the standard flow cytometry analysis of TECs, we reveal three novel mTEC subpopulations: mTECI (CD24+SCA1⁻), mTECII (CD24+SCA1⁺) and mTECIII (CD24⁻SCA1⁻). We find that mTECI include a mixture of both mTEC^{low} and mTEC^{high}, while the mTECII and mTECIII subsets are enriched for mTEC^{low} and mTEC^{high}, respectively. Production of CCL21 is specifically detected in a fraction of mTECII, while Aire expression is largely confined to the mTECIII. Using an in vitro lineage-tracing system, we show that mTECI and mTECII of mTEC^{low} type have the potential to generate all subsets, including Aire⁺ mTEC^{high}. Lastly, we show that while TNFRSF-induced mTEC maturation does not directly establish mTECI-III, signals provided by thymocytes at early developmental stages are sufficient to induce mTECI-III differentiation.

Collectively, these findings reveal a novel dimension of mTEC diversity and introduce new markers that will allow a better insight of the mechanisms underlying mTEC development and tolerance induction.

- **15348 | Glyphosate risk assessment**

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In 2015, the International Agency for Research on Cancer evaluated glyphosate as being probably carcinogenic to humans and the doubt still persists. It's the world's most widely used herbicide therefore it's highly important to keep researching about this matter, develop risk assessment for the compound based on realistic scenarios (in this investigation, a viniculture one) and highlighting analysis carried by renown entities.

In order to determine if Peso da Régua population of 15 984 people could develop cancer or other diseases direct or indirectly related with the use of glyphosate during a 6 years exposure, the case study chosen was an hypothetical 20 hectares vineyard with a silt soil composition of about 10% sand and 11% clay. It was also considered that the solar intensity was low and the wind velocity weak. The release of the herbicide was considered to be instantaneous and the irrigation manual. The slope of the terrain was also taken under consideration as well as Darcy's medium linear velocity and a retardation factor caused by the physical underground resistance that the glyphosate encountered during its path between the contaminated vineyards and nearby wells. Furthermore, the 3 possible ways of exposure (dermal contact, inhalation and oral intake) were analyzed and the exposure in this particular scenario quantified. The dermal analysis focused inhabitants exposure during showers; the inhalation exposure focused not only the population as a whole but also and in particular the farmer that sprays the vineyards with the glyphosate roundup; and for the oral exposure was considered the intake of water (including through cooking) and red wine cultivated in the region and consumed by locals. Consequently, the medium amount of glyphosate during the exposure time and the medium dose by unit of time throughout the lifetime of an individual from that population were calculated and analyze.

- 15349 | The morphological situation of the end-of-row in collective housing buildings – analysis and proposal of a manual

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The issue of the "open" *end-of-row* (1) is introduced to FAUP architecture students of Project 3 at the beginning of the third year. However, besides its literal explanation, nothing seems to exist in terms of scientific research on the subject. Thus, the current research intends to build a study base of the theme, with an in-depth analysis through case studies.

Firstly, a contextualization of the topic is presented in order to understand its emergence and the relevance of its approach. Then, the following parameters are determined for the analysis of the *end-of-row* which constitute chapters of the research: urban position; building shape; *end-of-row* orientation; access/typology; number of *end-of-row* dwellings; interior configuration. Each of these parameters integrates a set of characteristics which can be found in several case studies, making it possible to understand ways of combining different features in a single building, but also its implications in the *end-of-row* design.

Nonetheless, one of the purposes of the research is to deepen the study of *end-of-row* dwellings and its interior configuration. Therefore, it becomes important to set up a comparative analysis of the examples through its redesign for a better understanding of the interior spaces, always looking for a didactic, objective and descriptive approach.

In this sense, the research aims to function as an easy-to-consult manual to guide students throughout the design process.

This investigation integrates a master thesis in development under the supervision of Professor Marta Rocha.

(1) Expression used by Bernard Leupen in *Housing Design: a manual* (2011) when referring to the last dwelling of a row building. This is the only word found to date that can resemble "topo livre", portuguese expression.

- **15350 | Highly Stable MOF Materials as Sustainable Catalysts: Oxidative Desulfurization of Fuels**

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Oxidative desulfurization (ODS) is a promising sustainable and cost-effective method for the deep desulfurization of diesel fuel, allowing the efficient removal of the most refractory sulfur-containing compounds and leading to near zero sulfur fuels under mild conditions (low temperature and pressure) [1]. Following our research in functional crystalline materials, we have been developing novel catalytic systems for efficient ODS processes resorting on Metal-Organic Frameworks (MOFs) and MOF derived materials as active heterogeneous catalysts.

Highly stable MOF UiO-66(Zr) has been applied as heterogeneous catalyst in ODS. Using strategic sustainable methodologies, active catalysts were prepared by solvothermal and microwave-assisted synthesis, which enabled the preparation of active materials after only 15 minutes of reaction [2]. 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. To promote their recyclability after the third catalytic cycle, a novel reactivation process was further developed.

We are following this trend of interest by developing novel MOF derived composite materials, exploring the encapsulation of polyoxometalates in their pores and the conjugation of these materials with different mesoporous structures.

Acknowledgments: The financial support of UE, FEDER and COMPETE 2020 (POCI-01-0145-FEDER-007265) through PT 2020 and by national funds through the FCT/MCTES for the research centre REQUIMTE-LAQV (UID/QUI/50006/2013), and Project PTDC/CTM-CTM/31983/2017. Additional thanks to the FCT/MCTES for the doctoral grant SFRH/BPD/95571/2013 (SOR).

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- **15351 | Role of psychopathic traits on Economic Decision Making**

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Psychopathy is described as a complex conjugation of different traits that may be organized into three dimensions (Patrick, 2009): (a) disinhibition; (b) meanness; and (c) boldness. The relationship between psychopathy and executive functioning has been vastly described in the literature, although a consensus has yet to be achieved regarding the extent of the link between them. Decision making, as a crucial process of executive functioning, has been mostly studied through economic decision tasks due to their similitude to real life decision phenomena and uncertainty.

As a primary aim, this study focused on the relationship between the above-mentioned psychopathy traits and decision-making patterns in healthy university students. We used an economic task based on a dichotomic approach to economic growth: an adapted version of the predator-prey game in which participants are asked to invest as many credits as they want from a 10-credits endowment they are given in each round. We found the different rules applied to each role influence the decision-making patterns, namely the amounts invested by the participants. The preliminary results show a significant increase of credits invested when playing as prey, i.e. defensive role ($M = 5.15$; $SD = 1.12$) comparing to the amount invested when in the predatory role, i.e. attacker ($M = 4.24$; $SD = 1.52$).

Data regarding psychopathy is consistent with potential adaptiveness of some traits, such as boldness which is related to a low reactivity to stress. This adaptiveness might result in a more effective set of responses for each role, therefore, different patterns of response may depend on the psychopathy scores.

- **15353 | Hydration Status in Cerebral Palsy**

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Introduction: In Cerebral Palsy there are several secondary clinical manifestations that limit the ingestion of food and liquids, which often results in an inadequate nutritional status and changes in the hydration status. The objective of this study was to evaluate the hydration status in Cerebral Palsy and to know the attitudes regarding hydration that the caregivers and individuals with Cerebral Palsy have.

Patients and Methods: We recruited 69 adults with Cerebral Palsy from a Rehabilitation Center, of which 45 met all eligibility criteria and were included in this study. A blood sample was collected and the osmolality was evaluated to classify the subjects' hydration status, considering hypohydration for values above 295 mOsm/kgH₂O and hyperhydration under 275 mOsm/kgH₂O. In addition, a questionnaire was applied to participants (n = 14) or caregivers (n = 31), to assess their attitudes towards hydration.

Results: In this sample, 73.3% of the individuals were classified as euhydrated, 17.8% hyperhydrated and 8.9% hypohydrated. The mean ($\pm$ SD) of serum osmolality was 282.49 ± 11.25 mOsm / kg H₂O. There were no statistically significant associations between osmolality and attitudes towards hydration ($p > 0.05$).

Conclusion: Although most participants were classified as euhydrated, hyperhydration and hypohydration reached nearly one-fifth and one-tenth of the subjects, respectively. Better attitudes towards hydration were not associated with a better hydration status. However, caregivers with better attitudes towards their own hydration also have better attitudes towards their relatives with Cerebral Palsy.

- 15356 | Volatility Study of 1-Alkylpyridinium Bistriflimide Ionic Liquids

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Ionic liquids are low melting point ionic compounds, that present a unique set of properties, such as, low volatility, high thermal stability, wide electrochemical window and the ability to dissolve both organic and inorganic substances, which allow these compounds to be a promising option in applications like electrochemistry, extraction and catalysis [1].

Due to their low vapor pressures, accurate thermodynamic properties of vaporization for this family of compounds are scarce and yet essential for the better understanding of their liquid and gas phases [2].

In this work, the vapor pressure of the 1-alkylpyridinium bis(trifluoromethylsulfonyl)imide series, $[\text{C}_n\text{Py}][\text{NTf}_2]$ ($n=3, 5-9$), was measured by a Knudsen effusion method combined with a quartz crystal microbalance. The experimental vapor pressure data were fitted to the integrated form of the Clausius-Clayperon equation and the enthalpies and entropies of vaporization were derived. The thermodynamic properties of vaporization for the 1-alkylpyridinium bis(trifluoromethylsulfonyl)imide series, $[\text{C}_n\text{Py}][\text{NTf}_2]$ ($n=5-9$), are analyzed together with the results obtained previously for the shorter alkyl chain length $[\text{C}_n\text{Py}][\text{NTf}_2]$ [1], and the volatility of the imidazolium series $[\text{C}_n\text{C1im}][\text{NTf}_2]$ [3], in order to evaluate the effect of the alkyl chain size of the cation and additional insights concerning the nanostructuration of ionic liquids.

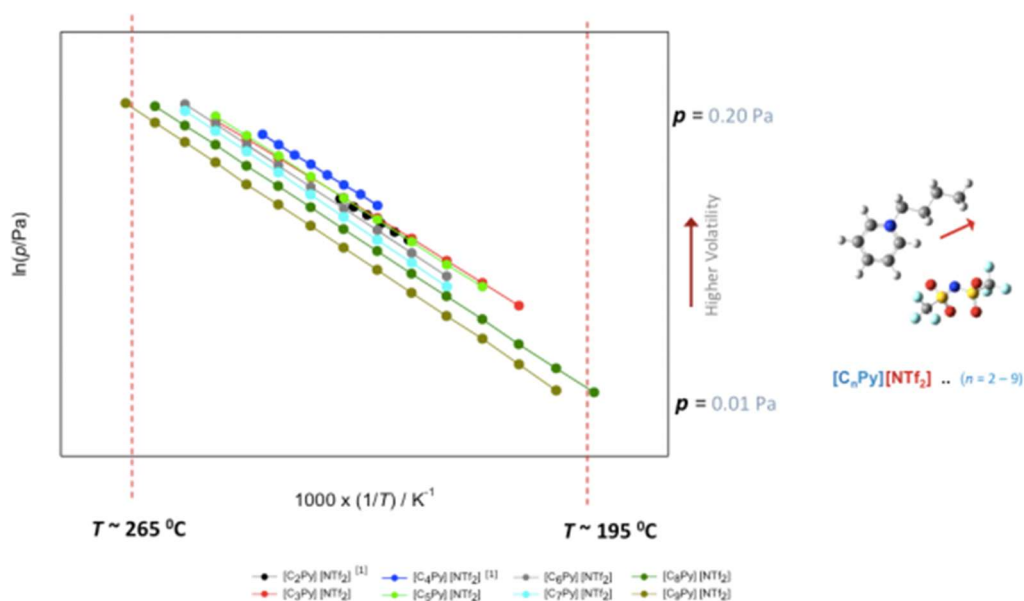
The $[\text{C}_n\text{Py}][\text{NTf}_2]$ series presents the lower volatility among the homologous series, with a trend shift at the Critical Alkyl Size (CAS $n = 6-8$), as a consequence of the nanostructuration of the ILs. The lower volatility of the alkylpyridinium derivatives is driven by their higher enthalpy of vaporization.

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Volatility Study of $[\text{C}_n\text{Py}][\text{NTf}_2]$ ($n = 2 - 9$)

- **15358 | Social Integration Income: are some of its requirements unconstitutional considering the constitutional principles of equality and parity of treatment between foreigners and national citizens?**

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The Portuguese Constitutional Court in its judicial ruling 296/2015 was confronted with the following question: was the requirement of a minimum of three years of legal residence in Portugal in order to be able to receive the RSI (social integration income) unconstitutional considering the constitutional principles of equality (article 13 of the Portuguese Republic's Constitution) and parity of treatment between foreigners and national citizens (article 15 of the Constitution)? That was the issue I decided to analyse in my work.

Through the examination of the two aforementioned constitutional principles, alongside legal doctrine regarding them, statistical data regarding foreigners' representation in the receipt of social protection benefits, as well as the decision method the Constitutional Court should adopt in the analysis of such matters, interlinked with the study of the principle of proportionality (article 18 of the Constitution), led me to a conclusion different to the one the Portuguese High Court reached.

In short, I did not find the principle of parity of treatment to have been violated. Both foreigners and national citizens have access to the RSI, both subject to a condition of legal residence in the country for a minimum of years. The three year restriction is merely a reflection of the legislator's margin of free assessment and intervention, allowed by the Constitution through the principle of proportionality (which allows fundamental rights to be restricted if such a measure is proved to be necessary to guarantee other constitutionally protected interests, is proportional and not excessive). Also, the principle of equality has to be read as a way to assure the respect for human dignity and not as a way to completely homogenise social situations, in disregard for its concrete contours, having also not been violated.

- **15359 | Advection of passive particles by viscous point vortices**

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The dynamics of passively advected particles by point vortices in the inviscid case has been thoroughly studied over the years. It is known that these systems are characterised by the existence of regularity islands around the vortices, where the particles exhibit regular, non-chaotic, trajectories; in contrast, if the system is comprised of more than three vortices, any particle outside of the regularity islands exhibits a chaotic behaviour. The assumption of zero viscosity is, however, questionable in most physical systems, therefore there have been some recent attempts to study systems comprised of viscous vortices.

The aim of this work is to study the behaviour of passively advected particles in a viscous environment. To do so, we consider a model based on the Lamb-Oseen vortices, usually called the multi-Gaussian model, to describe the time evolution of the vortices; we then compute trajectories of test particles and try to measure the chaoticity of their movement.

- **15361 | Blockade of ADP-sensitive P2Y12 and P2Y13 receptors rescues the P2Y1-operated osteogenic commitment of bone marrow mesenchymal stem cells from postmenopausal women**

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The role of ADP-sensitive P2Y1, P2Y12 and P2Y13 receptors on the osteogenic commitment of human bone marrow mesenchymal stem cells (MSCs) is controversial. P2Y1R activation sensitizes MSCs to parathormone, while the P2Y13R is associated to bone remodelling in rodents. Blockage of P2Y12R with the anti-thrombotic, clopidogrel, causes dual role on bone homeostasis depending on dosing. Here, we tested the osteogenic role of subtype-selective P2Y agonists and antagonists on cultured MSCs from young and postmenopausal (Pm) women. Cells growth (MTT assay), osteogenic commitment (alkaline phosphatase activity, ALP), and bone nodule formation (Alizarin red assay) were decreased in MSCs from Pm vs. younger women. The P2Y1R expression remained constant throughout the assay (7~21 days) in younger women, but its levels declined progressively in cultured Pm MSCs. Likewise, P2Y12R and P2Y13R were more expressed in Pm MSCs at day 7 vs. day 21. Selective activation of the P2Y1R with MRS 2365 (0.1 M) increased younger cells growth (at culture days 7 and 14 by 64 6% and 35 4%, respectively), ALP activity (1073 368%, at culture day 21) and mineralization (185 28%, culture day 35). The P2Y1R agonist was devoid of effect on Pm MSCs, unless P2Y12R and P2Y13R activity was blocked with AR-C66096 (0.1 M) and MRS 2211 (10 M), respectively. Data suggest that P2Y1R agonists in combination with P2Y12R and/or P2Y13R antagonists may be a new strategy for the treatment of bone defects in Pm women.

Work supported by FCT (UID/BIM/04308/2016 and PTDC/MED-FAR/29398/2017) and FEDER (POCI-01-0145-FEDER-029398). RC is in receipt of a PhD fellowship by FCT (SFRH/BD/135942/2018).

- **15363 | Institutionalization as an eventual life event: anticipation and communication between late adults and their direct relatives**

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Based on the perspective of the course of life, this study has as objectives: 1) analyze the subjective representation that the late adults and their direct relatives have about the institutionalization and the conditions in which would be justified, in their cases, the resort to it; 2) understand if, to what extent and in what way, the theme of institutionalization is present in the interaction/communication between the late adult and the significant people in one's network of proximal relationships. For this purpose, it was performed a qualitative study, of exploratory nature, using the semi structured individual interview. 8 elderly people and eight direct relatives participated, being both mostly female. In the first generation, the ages vary between the 62 and 82 years old and, in the second, between the 29 and 57 years old. The results obtained allow to conclude that: 1) the elderly prefer to be taken care of in familiar environment and elect their own houses as the ideal place; 2) in the majority of the cases, there is no familiar communication about the theme "institutionalization"; 3) the elderly believe that their direct relatives will do everything that is possible to correspond to their wishes although the sons and daughters don't know the will of their parents at this level; 4) on the other hand, the youngest understand the care to their parents as being an obligation for the care received and assume that will do everything possible to satisfy their will that they infer to be those of the parents; 5) the elderly have the perception that, as the years pass by and the possible dependency situations, there is a decrease of their power in the family, showing resignation towards the decision taken by the same. These results may constitute as useful references in the definition of objectives and intervention strategies that may potentiate in the families, an interpersonal climate favorable to discussion and negotiation of the interests of both generations.

- **15364 | Ketamine and norketamine: enantioseparation, enantioselective ecotoxicity and biodegradation studies**

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The current and growing evolution of the chemical industry has contributed to an urgent environmental and forensic problem, since numerous substances, including drugs and illicit drugs, have been detected in the environment, behaving as environmental contaminants [1]. Excessive consumption and continuous disposal of these substances may present potential short-term and/or long-term risks for humans and other exposed organisms [1]. Ketamine (K) is used in pediatric and veterinary medicine as an anesthetic, however, its increasingly being used abusively by adolescents and young adults in recreational environments due to its hallucinogenic and sedative effects. After consumption, K and its main metabolite, norketamine (NK), are excreted into the sewage networks and have been detected in effluents from wastewater treatment plants (WWTP) and in aquatic environments [1]. However, their enantioselective toxicity effects are unknown. This work describe the development and validation of a high performance liquid chromatography (HPLC-DAD) chromatographic method to quantify the enantiomers of K and NK. The method was applied to followed the biodegradation assay of K by activated sludge. The pure enantiomers of K and NK, were also achieved by semi-preparative chromatography using amylose carbamate derivative as chiral stationary phase. The enantiomeric purity of the enantiomers was assessed by the analytical method previously performed and validated. To assess the impact and adverse effects of these substances, racemates and the pure enantiomers of K and NK, acute and chronic toxicity assays were performed in aquatic organisms, in crustacean *Daphnia magna* and in protozoan *Tetrahymena thermophila* in accordance with national and international standards (ISO and OECD).

Acknowledgment

StrategicProjectUID/Multi/04423/2013 Projects:BIOENVIROM-CESPU-2018 and ChiralDrugs_CESPU_2017.

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- **15365 | Development of an analytical methodology based on QuEChERS technique to determine emerging mycotoxins in plants and infusions**

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The consumption of teas and infusions has gained increasing importance due to its richness in compounds beneficial to our health, in particular phenolic compounds endowed with antioxidant activity. These products, however, are not exempt from the possibility of the presence of chemical contaminants such as mycotoxins. Mycotoxins are secondary metabolites produced by certain species of filamentous fungi, belonging mainly to the genera *Fusarium*, *Aspergillus*, *Penicillium* and *Alternaria*. Within mycotoxins there is a group that is commonly classified as "emerging mycotoxins", since they are not routinely studied and are not yet covered by existing regulations. The most relevant examples are Enniatins, Beauvericin, Sterigmatocystin.

In this work an analytical methodology was developed and validated for the determination of several emerging mycotoxins in plants and infusions. The extraction of the compounds was based on the QuEChERS technique, optimized according to the specificities of this type of samples. The detection and quantification of the different mycotoxins was performed by liquid chromatography coupled to tandem mass spectrometry (LC-MS/MS). The method showed recoveries for all target substances near 100% with average Relative Standard Deviation (RSD) lower than 20.3%. LOQ and LOD were respectively 10 and 40 µg/kg, for the plants, and 2 and 2.5 µg/L for the infusions.

In the analyzed samples, 19 different types of plants were contaminated with at least one of the emerging mycotoxins (Beauvericin, Enniatins and Sterigmatocystin). Most of the contaminated samples had more than one mycotoxin, simultaneously. In the case of infusions, only 6 types were contaminated, presenting a drastic decrease of maximum concentrations.

- **15366 | Structural coloration based on Photonic Crystals for coating applications**

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Structural colors (SCs) have gained a recent interest since appear as an environment-friendly strategy for the substitution of traditional colors of paints, mostly based on pigments and dyes that could contain toxic substances in their degradation. They show an iridescent effect, being iridescence classified as the process in which the color of a surface varies depends on the angle and observation and source of illumination. This type of color is found in nature, for example in butterflies and insects [1]. A synthetic method for obtaining SCs is by the preparation of Photonic Crystals (PCs) which are self-assembled highly monodispersed structures with periodic variations in the dielectric permittivity and a photonic band gap (PBG) [2]. The presence of this PGB determines their ability to control the propagation of light, allowing PCs to be an ideal platform for the development of novel coatings. Thus, the application of PCs in common surfaces (glass, paper, wood) will provide an iridescent effect to these materials.

A pallet of colors based on PCs have been synthesised and characterized. This communication will present and discussed the last results of this project.

Acknowledgements:

This work was co-funded by European Structural and Investment Funds in the FEDER component, through the Operational Competitiveness and Internationalization Programme (COMPETE 2020) Project No. 23910 "Night Vision".

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- **15368 | Considerations About The Concept of the Multiple and the Emancipation of Drawing**

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The investigation that we propose to present deals with the concept of the multiple. The thesis of this project focuses itself on the presence of the multiple and the influence it exerts, whether as an inherent characteristic of the real or as an agent of transformation. This thesis will try to make visible a new phase where the multiple reigns supreme, with a specific focus on the practice of drawing.

We will try to make clear that this new phase has clear repercussions in artistic productions and in our answers in relation with the world. Through a cognitive and phenomenological approach, this investigation argues in favor of a new perception of the world, which is thoroughly sustained and made visible by the advances made in four areas: technology, the arts, astrophysics and philosophy.

While part of the final thesis under the master of Contemporary Artistic Practices of the Faculty of Fine-Arts of Porto, the project was divided in two parts. The first one was dedicated to a theoretical investigation, which became a book entitled "O QUE É DO MUNDO, NO MUNDO FICA". The second one, concerned strictly with the practice of drawing, developed into an exhibition with the same name, that took place in the Museu Nacional Soares dos Reis. In this last one, there was an intent to question and speculate about the concept of the multiple through the practical approach of drawing. We will present how both parts manifested and the multiple differences between each.

With this communication, besides presenting the investigative path that was taken with this thesis, we will also try to present options, that either solve previous gaps, or give continuity to the broader investigation concerned with drawing and the concept of the multiple. Thus, one of our objectives it to try and reach a real and objective perception of a concept, that is by nature, abstract.

Keywords: multiple, drawing, change, world, fragment, image, network.

- 15369 | I think it's attenuation, isn't it? - Comparative study on the presence of attenuation mechanisms in the discourse produced by men and in the discourse produced by women

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Based on some foundational presuppositions of the study of linguistic attenuation and politeness and its development in the field of Language and Gender, it is the purpose of this paper to investigate the differences between men's and women's speech and, above all, to assess the degree of relevance of this difference in which concerns the use of attenuation by both genders. Furthermore, we will try to understand whether this difference corresponds to an unbreakable association between language attenuation and female gender, or whether there will be other social factors to consider. As theoretical framework, this paper will be based on concepts such as hedges, vague character and levels of epistemic modality of language, as well as the work of Lakoff (1972) and Coates (2013). The attenuation mechanisms particularly studied will be, according to the taxonomy of attenuation phenomena of Briz and Albelda (2013), constructions that introduce opinion and the interrogative particle "isn't it?", which seek to minimize the illocutionary force of the acts and to remove responsibility to the speaker. The corpus used in the analysis will be formed by three television programs of the national public channel in which men and women are interviewed separately and whose format is different among the three, concerning degrees of formality and theme. The analysis will be, in a first stage, quantitative, showing which are the most used attenuators and then a particular analysis of the mechanisms already mentioned will be made, given their predominant occurrence. The aim of this research is not only to clarify the quantitative differences in the use of attenuators between both genders, which is nevertheless an important element for discussion in this field, but also to seek an explanation for its greater occurrence in speech produced by women, thus contributing to the clarification of the characteristics of women's speech and the influence of the extra-linguistic context in it.

- 15370 | The path to Tax Harmony: the role of the Court of Justice of the European Union

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With the heterogeneity of tax systems, globalization and the development of economic zones, there is an immediate need for regulations at European Union level. Such laws should contain harmonizing measures in the area of direct taxation, in order to not jeopardize the exercise of our fundamental economic freedoms set out in the Treaty on the Functioning of the European Union. The diversity of tax systems, in addition to a lack of harmonizing rules, once that direct taxation falls within the competence of the Member States, which alone have the power to determine the basis and rate of direct taxes, leads to an encouragement of tax avoidance and evasion, and tax competition. Every day, situations of double taxation, aggressive tax planning and tax havens continue to challenge Member States, and since this matter does not gather much consensus, being subject to different interpretations, it is intended with this study to question if it is possible a harmonization of direct taxation based on legislation and jurisprudence of the Court of Justice of the European Union.^[1] To answer, we start by analysing the principles and fundamental freedoms listed in the European treaties and notions used by the European legislation. An approach to the existing harmonization mechanisms will be followed. Then, we discuss the growing tax harmonization of direct taxation by negative carried out by the European Court of Justice. And finally, as a result, we present the evolution of jurisprudence of the Court of Justice of the European Union.

- **15371 | The impact of iron overload on MRP2-dependent biliary excretion**

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Toxic iron levels may accumulate in the body due to the inability of humans to excrete the metal efficiently. Iron can be excreted into bile via multidrug resistance-associated protein 2 (MRP2), the major exporter in the canalicular membrane of hepatocytes, but to a much lower extent than other metals, for reasons that remain unknown. We investigated the effect of excess iron on MRP2-dependent biliary excretion and on the expression of relevant genes in rodent models of iron overload. We also evaluated the role of transcription factor Nuclear factor-erythroid 2-related factor 2 (NRF2), on the regulation of MRP expression by iron.

To address the influence of iron overload on MRP2-dependent biliary excretion in vivo, we treated Wistar rats with iron dextran or dextran (control). We studied the biliary excretion rate of bromosulfophthalein, a compound that conjugates with glutathione and is transported via MRP2. Despite the inter-individual variability, iron-treated rats had lower bile flow and a trend for slower BSP clearance from blood. By real-time qRT-PCR, we also observed a trend for iron to inhibit the hepatic expression of genes relevant to biliary excretion. The results suggested that iron may regulate the expression of Gsta1 and MRPs, a possibility that we have further investigated using an inbred mouse strain, C57BL6J. We evaluated gene expression in the livers of WT and Nrf2^{-/-} mice treated with iron dextran vs. dextran (a model of parenteral iron overload) or fed iron-rich diet vs. standard diet (a model of dietary iron overload). Whilst we observed no significant changes with parenteral iron, dietary iron induced Abcc2-4 expression in WT, but not in Nrf2^{-/-} mice. To conclude, our results suggest that iron dextran impairs bile production in rats, but a specific effect on MRP2-dependent biliary excretion remains unclear. Dietary induces the expression of murine Abc2/4 and Gsta1 in an Nrf2-dependent manner. The effect of NRF2 warrants further investigation.

- **15373 | Eros and love in Eugénio de Andrade's Poetry**

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Taking classic mythology in consideration as an indispensable pillar for Eugénio de Andrade's poetry, the study to be discussed analyses classic and well known mythologic figures such as Eros and, by extension, Aphrodite, Psyche, Anteros and Thanatos both in Andrade's earliest and latest poems and literary antique tradition(s). Eros is taken to be a deity responsible for all mutations related to organic elements both in nature and, consequently, mankind. Thus Andrade's focus on the man's body and sexuality is pertinent, for they are tools used to gain (self)knowledge intimately connected to arete, i. e. linked to a sense of (self)construction that leads to perfection and consequent divinization throughout pleasure experiences and communication. Thus put, the antinomies body/mind (or soul) and materiality/spirituality are no longer opposite to each other, therefore being parts of the same essence. The poems to be read and discussed are «Soneto» and «Apenas um corpo» in *Até Amanhã*, «Surdo, Subterrâneo Rio» in *Os Amantes sem Dinheiro* and «Eros Thanatos» in *Ostinato Rigore*.

This article was made in the course of *Matrizes Clássicas na Poesia Portuguesa*, last year.

- **15377 | Inflammatory bowel disease alters angiotensin II-activated pathways in the rat colon**

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Introduction: Inflammatory Bowel Disease (IBD) is a chronic autoimmune condition. The intestine expresses a local renin-angiotensin system but the effect of angiotensin II (AngII) in IBD remains poorly characterize.

Aim: To characterize the reactivity of AngII on the upstream distal colon (UDC) and terminal distal colon (TDC) of control rats and in rats with TNBS-induced IBD.

Methods: Protocols were approved by the Animal Welfare Body. Male Wistar rats (8-12 weeks) were rectally instilled with a 30% ethanolic solution of TNBS (20 mg/rat) or used as controls. After 7 days, rats were euthanized and segments of UDC and TDC mounted in isolated organ baths. Non-cumulative concentration-response curves to AngII were obtained and the effect of candesartan 10nM, PD123319 100nM, TTX 1μM, atropine 1μM or L-NAME 100μM was tested. Statistical analysis was performed by Student's t test.

Results: AngII caused a lower concentration-dependent contraction in UDC and TDC of TNBS-induced rats than in controls (UDC: 69.40 ± 16.36 mN/g vs 343.4 ± 84.83 mN/g; TDC: 31.52 ± 9.26 mN/g vs 323.4 ± 47.27 mN/g; respectively; $p < 0.05$ for both). Candesartan abolished the response to AngII in UDC and TDC of both groups; PD123319 only increased it in control rats. TTX increased the contractile response to AngII in all colonic regions of both groups. L-NAME or atropine only increased it in the UDC of control rats.

Conclusion: Reactivity to AngII is lower in TNBS rats than in controls. AT1-mediated contraction is preserved but the AT2-mediated is lost in diseased rats. Ang II activates a prejunctional inhibitory mechanism, NO and muscarinic receptors.

Acknowledgements: This work received support from the European Union (FEDER funds through COMPETE) and National Funds (FCT) through project Pest-C/EQB/LA0006/2013 (Portugal). Also, Professor Manuela Morato thanks GEDII - Grupo de Estudo da Doença Inflamatória Intestinal, for funding. All authors thank Mrs. Céu Pereira for excellent technical assistance.

- **15378 | "The Sentencing of Corporate Crime"**

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White-collar crime and corporate crime are phenomena of great social concern, largely because of their strong negative economic, financial, environmental, political and social consequences (Friedrichs, 2009). In order to explore how corporate crime has been prosecuted, the main goal of this investigation is to understand, to what extent, legal and extralegal factors determine the concrete application of a penal sanction, when the defendant is a corporation. In an effort to operationalize "corporate crime" we consider, at first, the criminal offenses listed in Decreto-Lei n.º 28/84, dated January 20th, and, secondly, corporations as defendants. To do this, we use document and content analysis, applying a grid for sentencing analysis to all convictions of the courts of first instance of Porto county, which met the defined inclusion criteria (N=66). The time period of the analysis is from 1 January 2002 to 4 April 2018.

It was found that only one legal factor is statistically significant to the fine received by the corporation - the economic situation of the agent -, however, against the advanced hypotheses that its qualification as "aggravating" would lead to a higher fine. Regarding the extralegal factors considered, two are statistically significant: the existence of non-patrimonial damage, that is associated with a higher fine, as predicted; and the reparation of the damage, which is associated with a higher fine, contrary to what was initially predicted. The absence of significant results may be due to the small size of the sample. So, future research should attempt to replicate this investigation to sentences existing in other portuguese counties, issued under the same legal diploma and/or under other laws whose crimes are likely to be considered corporate crimes. The study of corporate crime, particularly its sentencing, has great importance, since knowledge of its punishment will allow the adequacy of public policies related to the phenomenon and will help to harmonize the mixed results of empirical literature.

Key-words: corporate crime; white-collar crime; sentencing; corporations; justice; courts; judges; economic offenses.

- **15379 | Immunomodulatory Nanoparticles for Intervertebral Disc Degeneration**

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Nanomaterials have been used in biomedical field with several applications. One of their most attractive features is their ability to modulate the immune response. Previous work from our group showed that Chitosan (Ch)/Poly- γ -glutamic acid (γ -PGA) nanoparticles (NPs) stimulate antigen-presenting cells, promoting a pro-inflammatory response, which can hinder cancer cell invasion, while Ch/ γ -PGA NPs combined with an anti-inflammatory drug, Diclofenac (Df), reduced macrophages activation and intervertebral disc (IVD) pro-inflammatory cytokines, turning Ch/ γ -PGA NPs appealing as immunomodulatory nanomaterials.

The main goal of this work was to engineer Ch/ γ -PGA NPs, with and without Df, in order to increase their stability at different pHs, ranging from the physiological pH to acidic pH commonly found in inflammatory microenvironments, using a strategy based on a chemical modification by a Genipin (Gn) cross-linking. This strategy was also expected to decrease the release profile of Df. In the end, the immunomodulatory potential of Gn-NPs and Gn-Df-NPs was tested in vitro, using activated macrophages. We optimized Ch/ γ -PGA NPs cross-linking with Gn, using a concentration of 20 mM and an incubation time of 2h. Gn-NPs (184.45 nm and 0.32 polydispersion index) slower the Df release and were stable at different pHs. Moreover, Gn cross-linking could have tuned the immunomodulatory properties of Ch/ γ -PGA NPs to a less pro-inflammatory profile, which may be useful in several applications in tissue regeneration.

Future studies should focus on the improvement of this nanosystem to establish an undoubted immunomodulatory potential and to potentiate its use as drug delivery system. This effect could be beneficial to IVD degeneration applications, where control of inflammation is key to the control of low back pain. Overall, Gn-NPs developed might be a potential candidate to modulate macrophages pro-inflammatory profile and to treat IVD degeneration associated inflammation.

- **15386 | Rounded Corners Buildings: a journey through Porto multi-family housing in the first half of the 20th century**

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The dissertation "*Rounded Corners Buildings: a journey through Porto multi-family housing in the first half of the 20th century*" was developed with the explicit objective of reflect about corner buildings in the city of Porto through a set of bibliographic information.

Throughout different synonymous of "*gaveto*" the most common is "*esquina*" - the corner building - the space that is the intersection of two walls. However, while this concept is defined as an concave or convex piece in woodwork, architecture has classified as a building with round front at the angle of two streets.

According to this definition we tried to identify buildings with curved shape thought a recognition of the urban context of Porto. Due to the breadth and diversity of existing cases, the definition of more specific geographical boundaries was defined, highlighting the area between the Douro River and the VCI.

From the total of 230 cases, 42 were analyzed according to three main themes.

The first - on allotment - a reflection was developed according to form and dimension of implantation of the drawer buildings. The second - on composition - a reflection was made on how the program can contribute to the formulation of different solutions. The third, and last, - on the image - was reflected on how the curved corner building communicates in the city.

Following different spatial solutions drawn by the different designers or variety of views expressed by few authors who wrote about the theme, all mention he same characteristic: the construction of the facade is designed in union.

Sometimes characterized as reproduction of European models, sometimes characterized as intention of incorporating a new design in the city these 42 case studies define different possibilities. As a symbol and/or a metaphor, they are much more than the simple intersection of two street fronts.

Master thesis with the supervision of Professor Marta Rocha.

- **15387 | ReDEFine - Evaluation of Aguieira's Albufeira Water Quality: in addition to the Water Framework Directive**

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Water Framework Directive (WFD) uses different metrics to determine the status of water bodies, but it ignores different timescales and biological levels. The present work aims to evaluate the water quality of Aguieira reservoir according to the WFD. Additionally, we intend to evaluate the effectiveness of other ecological tools that may be suggested in addition to the WFD. To evaluate the water quality according to ecological potential (EP) of Aguieira reservoir, 4 sampling sites were chosen. Physical and chemical water and phytoplankton community parameters were analyzed according to WFD metrics. In addition, a set of ecotoxicological tests (bacterial cell viability and inhibition of *Raphidocelis subcapitata* growth) were evaluated using sampled water in three conditions (NF-without filtration, F1-filtered by 1.2µm pore, and F2-filtered by 0.2µm pore). Preliminary results revealed that physical and chemical parameters at site 3 had moderate quality of EP due to the high P concentration, while the remaining sites achieved good EP. All chemical compounds measured were below the recommended values. Regarding biological parameters, chlorophyll a ecological quality ratio showed a moderate or low ecological potential at sites 2 and 3, while the other sites presented a good or high EP. For the ecotoxicological assays, a growth inhibition of *R. subcapitata* was observed for all sites in NF and F1 water conditions. Overall, in *D. magna* assay a high feed rate at site 1 and 2 was observed, while in the remaining sites was recorded an increase of feeding rate for all the water conditions. Regarding *D. longispina*, a feeding inhibition was observed for all water conditions from all sampling sites. Similar patterns were observed for *L. gibba*, where growth inhibition and a decrease of chl a concentration were observed. These latter ecological tools give us more relevant information about the water quality than those proposed by the metrics of WFD.

- **15389 | *Opuntia ficus-indica* (L.) Miller cladodes: valorisation for food consumption**

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Opuntia ficus-indica (L.) Miller has been increasing in Portugal, in the last decade, and consequently, the availability of cladodes - the stems of cactus - it's getting higher [1]. Cladodes are not part of the Portuguese food pattern, but their recognition and valorization as food can contribute to food security.

This study aimed to assess the nutritional composition and antioxidants content of the *Opuntia ficus-indica* (L.) Miller cladodes. The samples were obtained from a cactus orchard in Torres Novas (Portugal). Total fat, protein, ash, and dietary fibre (total, insoluble and soluble fractions) were assessed according to official methods [2] and expressed as g/100 g of dry weight. Carbohydrates were evaluated by difference. Additionally, antioxidant's extraction using different solvent: (a) 100% water, (b) water/ethanol (50/50; v/v), and (c) 100% ethanol was assessed and total phenolics (TP) content compared as well as the antioxidant activity (DPPH_o inhibition and FRAP assays).

Cladodes had a high content in total dietary fibre (33%) in which 12% was soluble fibre. Regarding the total fat, cladodes presented 2.1% whereas the total protein and ash were 15.2 and 8.5%, respectively. Total carbohydrates attained 40%.

The solvents (a) and (b) presented similar contents of TP (30 mg GAE/g). Antioxidant activity was, as expected, also higher in these extracts.

Given the nutritional importance revealed in this study, it is expected the use of cladodes in food proposals, promoting diversity and nutritional value.

Acknowledgments:

The authors thank to producer Paulo Costa (Torres Novas), for kindly providing the samples.

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- 15392 | Physical exercise performs immunomodulator role in *Toxocara canis* infection in mice

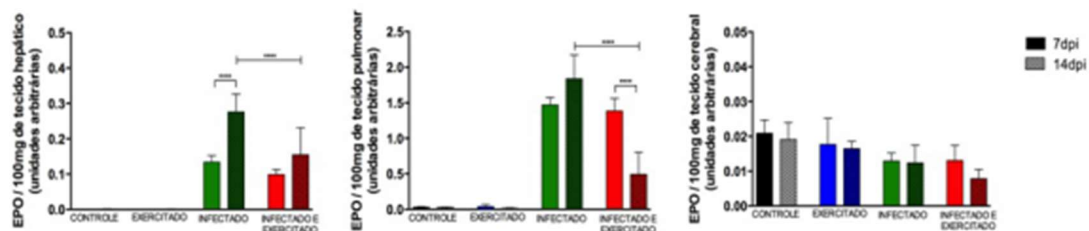
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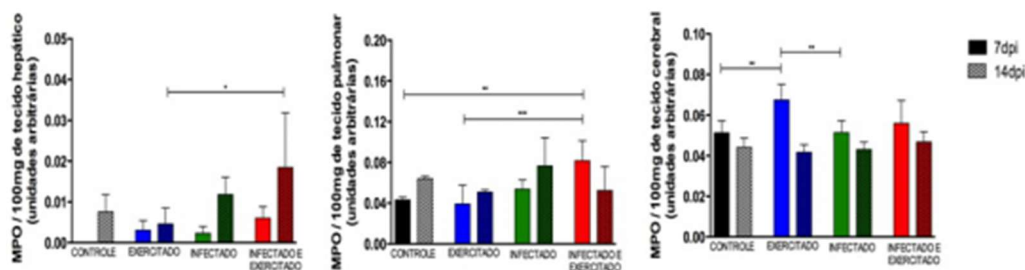
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Toxocara canis infection in paratenic hosts leads to the hatching of embryonated eggs and the dissemination of larvae in a systemic way, reaching vital organs. Eosinophils and neutrophils are innate immune system granulocytes that eliminate *T. canis* infections and trigger the type 2 inflammatory response. The content of these polymorphonuclear granules contain enzymes that are toxic to helminths, which are eosinophil peroxidase (EPO) and myeloperoxidase (MPO), respectively. Thus, the objective of this study was to quantify the EPO and MPO in the liver, lung and brain of *T. canis* infected mice submitted to the moderate intensity swimming with 1 session/day of 90 min for 28 days. Adult BALB/c mice were divided in groups: Sedentary without infection (C), sedentary with infection (SI), exercised without infection (EX, 14 days and EXE, 28 days) and infected with previous exercise and trained (TI). The infection was intragastric with 100µL of solution containing 1000 embryonated eggs. EPO results showed that in the liver, EX and EXE are different from SI and TI, and that SI had higher enzyme activity than TI; in the lung, C and EX are different from SI and TI, that was lower than EX 14dpi; and in the brain there was no difference between groups. On MPO, in the liver, the TI had higher enzymatic activity than the EX 14dpi; in the lung, TI also had higher enzymatic activity than C and EX 7dpi; and in the brain, EX 7dpi had higher enzymatic activity than C 7dpi and SI. In view of such findings, the amount of EPO is higher in the infected groups, and the exercise promoted decreased EPO in the liver and lung, both with 14dpi. The amount of MPO is greater in the brains of the exercised groups; and in the liver and lung, the infection promoted increased MPO. Thus, moderate exercise seems to play the role of eosinophil and neutrophil immunomodulator in the liver, lung and brain of *T. canis* infection in mice.



Graph 1. Peroxidase eosinofílica (EPO) in liver, lung and brain tissues of mice infected with *Toxocara canis*. The values presented were given in mean and standard deviation. The statistical differences were by the ANOVA oneway and post-test Holm-Sidak test. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, **** $p < 0.0001$.



Graph 2. Myeloperoxidase (MPO) in liver, lung and brain tissues of mice infected with *Toxocara canis*. The values presented were given as mean and standard deviation. The statistical differences were by the ANOVA oneway and post-test Holm-Sidak test. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$, **** $p < 0.0001$.

- **15396 | Green Public Procurement in the Municipality of Porto, Portugal**

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Green Public Procurement (GPP) is a tool which guidelines are being developed by the EU to be used by public bodies in order to reduce the environmental impacts of the purchases of goods and services. These guidelines includes environmental criteria, which are suggested to be included by public bodies in the tendering documents used for acquisitions.

This is an innovation tool, which is quite unknown in Portugal when compared to other EU member states.

The main objective of this work is to evaluate the degree of implementation of green purchasing practices in the acquisitions made by the Porto's Municipality (PM) for the reference year 2017. The purchases of Cleaning, Gardening together with the Food/Catering Products and Services are the three most significant purchases for by the PM. The analysis of purchases was made by reading the tender documents for the products/services above-mentioned to identify the incorporation of the green criteria within public purchases. Conclusions from this show that although the environmental concern at the municipality in the procurement actions is notorious, but the way these requirements are included in the specifications cannot, in most cases, be translated into something concrete that allows an adequate response of the suppliers.

An informal consultation with the suppliers of catering services was also made to better understand the possibilities they have to supply greener products/services. Four out of nine suppliers interviewed responded to the call and the answers allowed to perceive that there is a lack of knowledge on the provider's side on what the green criteria are, as well as a lack of knowledge on how PM and food/service suppliers may make use of the EU green criteria to lower the impact associated with the provision of catering services. This show the great potential for development of this innovative tool for public environmental policies.

- **15397 | The effects of basketball practice on the bone mineral density of athletes**

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Objective: The purpose of the study was to analyze and compare the bone mineral density (BMD) and bone mineral content (BMD) of women basketball player with a group of non-practitioners. **Methods:** Descriptive cross-sectional study of BMD and BMC of athletes and non-basketball players. Twenty-four healthy women aged 23-35 years were divided into: Group 1 (basketball athletes, n = 12) with a history of at least two years of systematic basketball practice and Group 2 (non-basketball athletes, n = 12), composed of women who did not practice basketball systematically. BMD and BMC were assessed by dual-energy X-ray absorptiometry of the lower limbs, arms, trunk, and whole body. **Results:** BMD was only statistically higher in the legs of Group 1 participants ($G1 = 1.31 \pm 0.08$, $G2 = 1.17 \pm 0.08$). There was no significant difference ($p > 0.05$) in BMD measurements between groups 1 and 2 for arms, trunk and total BMD. The BMC was higher in women of group 1 in arms, legs and total. Only the CMO of the trunk did not present significant difference between the groups ($p > 0.05$). Group 1 participants presented lower fat percentage and higher muscle mass compared to Group 2 (% Fat: $G1 = 31.3\% \pm 2.9$, $G2 = 37.8\% \pm 10.7$ / Muscle mass: $G1 = 43.14\text{kg} \pm 4.45$, $G2 = 39.24\text{kg} \pm 3.85$) ($p < 0.05$). **Conclusion:** basketball practice in adolescence resulted in adult females: greater BMD of the legs, greater BMC of arms, legs and total, greater muscle mass and lower % of fat. This reinforces the importance of basketball practice in childhood and adolescence for the health promotion and preventive osteoporosis in adulthood.

Key words: bone mineral density, bone mineral content, basketball, osteoporosis.

- 15399 | Roman Spectacle Buildings in Western Peninsular: Theaters, amphitheater and circuses.

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The purpose of this text is to disseminate the knowledge acquired in respect of Roman Theater Buildings in the West of the Iberian Peninsula, which will be the title of the future master's thesis, which will have 3 chapters.

The first chapter deals with the classical spectacles contextually, that is, their appearance in Rome and what shows were practiced at the time of adoption.

The second deepens the architecture and function of the buildings of spectacle, being that a division is made between the buildings of theater, amphitheater and circus. For the three types of buildings are presented the spectacles carried out in them, the social and cultural role and importance, the construction and architectural complexity and the architectural bases used in the Roman culture for these constructions.

The third and last chapter refers to the cases of study, to the buildings of spectacle in the West Peninsular: Circos, theaters and amphitheatres. The last chapter aims to present all the knowledge acquired in relation to these buildings in Portuguese-Spanish territory, where the complete study carried out during the two years of Master's Degree will be inserted, which consists of the chapter with greater focus and development attention of the study and information sharing.

This work aims to analyse the importance and awareness of the material and immaterial patrimony located in the Northwest Peninsular, occupying the entire Portuguese faction, extending to Galicia and occupying the westernmost part of Spain, the Merida line. The contribution of this work intends to expand the shared historical and archaeological knowledge in the Iberian Peninsula, assuming a role of creation of visual and invisible identity, and although several of the studied buildings are no longer physically present in the environment, we can not deny its importance for the contribution of the creation of the Roman Iberian Peninsula.



Sítios do ocidente Peninsular com edifícios de espetáculo romanos

- **15400 | A Political and economical instrument: the post industrial city of Poblenou, Barcelona**

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Historically known as the Manchester Catalan, Poblenou stands out, since the 18th century, as one of the largest industrial districts in Europe. Marked by the large factories, the houses and the enormous seafront that represented the port area, Poblenou is defined as the largest source of income and growth in Barcelona, moving from a merely peripheral territory to one of the central points of this city. However, in a context of post-war fragilization, the improvement of methods for international industrialization and increasing speculation on industrial land, has made Poblenou a ghostly neighbourhood whose buildings and industries were abandoned and where workers and residents would not have the economical ability to remain.

Several strategies have been implemented, each with its dynamics and direction, offering new urbanities to the place. Key moments can be highlighted, such as the Olympic Games of 1992, the Forum of Cultures and the 22 @ - Knowledge District. The present research focuses on the study of the urban evolution of this district of Barcelona and how it was dictated by the political-financial circumstances of the capital of Catalonia. Through the impact of these events on the reformulation of the territory, the research intends to understand the effects of these events in a contemporary city where industrial memory is placed side by side with a generic city proclaimed by technological evolution, tourism and the needs of a society of the future.

In a city that lives in two completely different rhythms, it seems necessary to understand how architecture and urbanism can function as mediators of these two distinct realities that need to be articulated.

This study is part of the development for the integrated master thesis in architecture, at FAUP, 2018/2019, under the orientation of Helder Casal Ribeiro. Its main objective is to contribute to the urban study of one of the areas with the highest contemporary development in Barcelona and its recent history.

- **15401 | UNRAVELLING THE MECHANISMS BEHIND MICROGLIA CONTROL OF PURINERGIC-MEDIATED ASTROGLIAL PROLIFERATION**

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Astrocytes and microglia are the main cells coordinating the inflammatory response in the brain. During inflammation, damaged cells release ATP that, acting on P2 receptors, induce astroglial proliferation, which is important to form a glial scar preventing widespread inflammation and neurodegeneration. Microglia prevent astrocyte proliferation elicited by ATP, assuming pivotal roles in the coordination of astroglial responses. Microglia release interleukins and prostaglandins that impair P2 receptors in astrocytes. Their nucleotidases also metabolise ATP into adenosine, which activates A2 receptors (A2R). Therefore, a number of messengers produced by microglia may contribute to modulate astroglial proliferation induced by ATP. The present study aims to identify the messengers produced by microglia that prevent ATP-induced astroglial proliferation. Co-cultures of astrocytes with 10-15% of microglia, and cultures of astrocytes with <1% of microglia were prepared from the cortex of newborn rats. The effect of drugs on cell proliferation was evaluated by methyl-[3H]-thymidine incorporation. Results were analysed by unpaired student's t-test or one-way ANOVA followed by Dunnett's test.

In astrocyte cultures, ATPgS (100 μ M) increased astroglial proliferation up to $185 \pm 5\%$ ($n=3$; $P<0.05$), an effect attenuated in co-cultures to $125 \pm 2\%$ ($n=3$). In co-cultures, the effect of ATPgS was not increased by the A2AR antagonist, SCH 58261 (30 nM) nor by the A2BR antagonist, MRS 1706 (10 nM), however, it was restored by indomethacin (10 μ M; $171 \pm 16\%$; $n=4$, $P<0.05$). Indomethacin (10 μ M) did not change the ATPgS effect in astrocyte cultures.

Microglia impairment of ATPgS-mediated astroglial proliferation is independent of tonic activation of A2R by adenosine but may involve eicosanoids released by microglia. This microglia-astrocyte communication may be relevant to fine tune the inflammatory response, allowing immune cells infiltration in the damaged area, before glial scar formation.

- **15403 | Oropharyngeal dysphagia and motor disfunction in cerebral palsy**

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Introduction: Oropharyngeal dysphagia is frequent in cerebral palsy and studies show its close relation with motor function in this population. In addition to being a risk factor for dehydration, it can lead to pulmonar aspiration and aspiration pneumonia. Fluid thickening is habitually used to achieve greater safety and efficiency in swallowing. The aim of this study was to evaluate the relation between oropharyngeal dysphagia and gross motor function in cerebral palsy.

Patients and methods: A survey was applied to 44 individuals aged between 5 and 64 years, with clinical diagnosis of cerebral palsy. Swallow efficiency was assessed (30 mL of water with different consistencies according to the nomenclature of the International Dysphagia Diet Standardization Initiative) through the Water Swallow Test.

Results: Among the 44 people evaluated, 75% (n=33) had the highest level of motor disfunction and 61,4% (n=27) drank through a spoon. For individuals who drank fluids with a spoon, of which 81,5% (n=22) were classified as gross motor level V, a positive correlation was found ($p=0,382$) between the consistency from which swallowing is safer for each individual and their motor function.

Conclusion: People with higher motor disfunction who drank with a spoon needed to ingest water with a thicker consistency. There is important need to develop a suitable dysphagia screening test in this population.

- **15406 | Genetic diversity of small mammals of Costa Rica**

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Costa Rica holds a high diversity of species, probably due to its positioning within Central America and to its biogeographical, tectonic and climatic history. This region likely served as bridge or barrier to several species, promoting divergence and differentiation since ~3 million years ago.

There are about 46 species of small mammals occurring in Costa Rica. This high diversity, the recent records of new species and molecular studies that detected cryptic genetic diversity in some small mammal's groups, highlight Costa Rica as an important region to study genetic diversity and phylogeography of this group. Therefore, this study had as main aims to analyse the genetic diversity of small mammals of Costa Rica and to study the phylogeography of the genus *Reithrodontomys*, a genus where recently new species were described, in the region.

Hence, we analysed samples collected in 6 sampling sites in Costa Rica for a mitochondrial gene (cytochrome b) together with previously published data, to study the genetic diversity of small mammals of Costa Rica. Moreover, to complement the phylogeographic study of the genus *Reithrodontomys* we analysed two nuclear genes in 20 samples.

Regarding genetic diversity in general, we obtained new data for species without previous information in GenBank and detected high intraspecific diversity in some species. Results from the analyses of the genus *Reithrodontomys* are congruent with previously published information, but new data relevant for the group taxonomy was also obtained. Both mitochondrial and nuclear genes show congruent results.

Overall, we observed a high genetic diversity in small mammals in Costa Rica, where some of the lineages detected may correspond to new cryptic species. Furthermore, and although molecular tools are especially important to detect cryptic speciation, the analyses of museum vouchers and samples is needed in order to properly understand cryptic diversity within the genus *Reithrodontomys*.

- **15412 | Prevalence of *Campylobacter* spp. in broilers: from arrival at the processing plant to shipment of meat**

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Infectious diarrhea is the largest cause of morbidity and mortality in the world. Campylobacteriosis has been the most commonly reported food-borne infection in Europe since 2005 [1]. Fresh broiler meat is the food source with highest occurrence of *Campylobacter*. The fact that chicken meat is the most widely consumed protein in the world has impact on the global burden of campylobacteriosis and the continuing growth of poultry meat production will put further pressure on the poultry industry to reduce poultry/chicken-associated human *Campylobacter* infections.

This work aimed to study the prevalence of *Campylobacter* spp. in 19 broiler flocks encompassing primary production (sampling faeces at the arrival at the slaughterhouse), slaughter process (neck skin after chilling) and meat (packed breast fillet without skin and after three days shelf life). Detection and enumeration of *Campylobacter* spp. was performed following ISO 10272-2:2017. *Campylobacter* species were confirmed by multiplex PCR.

Among the 57 samples tested, 26 (45.6%) were positive for *Campylobacter*. *Campylobacter jejuni* and *Campylobacter coli* were the only species found in all analysed samples. More specifically, 11 of the 19 (58%) faecal samples were positive, with a level of contamination of 6.2×10^6 CFU/g. Regarding neck skin, 53% (10/19) of the samples were positive with an average of 3.7×10^4 CFU/g. The predominant species in faeces and neck skin samples was *C. jejuni*. Finally, 21% (4/19) of breast fillet samples were positive; however, it must be emphasised that bacteria were only detected after 48 h of enrichment, being *C. coli* the most frequently isolated specie. Overall, it was observed a decrease in the level of contamination from faeces to neck skin in all sampled flocks. Interestingly, the level of faecal abundance of *Campylobacter* in faeces at the arrival of the slaughterhouse does not seem to influence the contamination of the marketed breast meat.

- **15414 | The Role of Social Environment in Pathways to Recovery: a Scoping Review**

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Substance misuse is a problem with severe social and physiological consequences for the individual and society itself. Being addiction a field with an overwhelming amount of research, through this review it's intended to ascertain the social-environmental factors associated with the recovery of drug addiction as well as possible research gaps.

The review was conducted through a wide search in 24 databases and 14 relevant sources of policy documents, thesis/dissertations, grey literature elements and scientific articles, whether they were qualitative, quantitative or mixed-methods. The studies focusing on social and/or environmental factors involved in the recovery and social reintegration of drug abusers were included, except if they targeted the misuse of licit substances, they included the subjects exhibiting psychiatric or somatic comorbidities, the studies were strictly descriptive, or if the study regarded an extremely specific population, such as pregnant women. The recently-published PRISMA-ScR was followed to report the main findings. 30 studies were selected for the final review, the majority published after 2011 and mainly focused on the patient's point of view. The most explored social and environmental factor was the network support from family and friends. Employment, stigma, 12-steps affiliation and socioeconomic conditions revealed some influence in the recovery and reintegration of the user. For future research, we advise that the factors in the psychotherapeutic context are surveyed, the perceptions of others aside from the consumer are assessed, and that research relating to socioeconomic reintegration is further developed.

The present review was developed as theoretical foundation for the DURESS (Drug Use Recovery, Environment and Social Subjectivity) project under the ERANID, being financially supported study by the General Directorate for Intervention on Addictive Behaviors and Dependencies (SICAD).

- **15415 | Evaluation of water stress in three varieties of chickpea (*Cicer arietinum* L.)**

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The effects of climate change on ecosystems are considered to be severe and ensuring food security and its sustainability in the face of change is considered a global challenge. As these changes and extreme climatic phenomena such as high temperatures and water scarcity are increasingly recurrent, it is necessary to find a solution between the primary component of biological processes - water - and its role in the performance of agriculture.

Chickpea (*Cicer arietinum* L.) is an important food legume in many countries, considered an important source of higher quality protein in the human diet.

The objective of this work was to study the effect of the water stress, submitted to the vegetative and reproductive phase, of three genotypes (Var1, Var2 and Var3) of chickpea.

The four water stress treatments used were: T0 - water comfort throughout the vegetative and reproductive phase, T1 - water stress throughout the vegetative and reproductive phase, T2.1 - water stress throughout the vegetative phase and water comfort throughout the reproductive phase and T2.2 - water comfort throughout the vegetative phase and water stress throughout the reproductive phase.

Chickpea plants of the three genotypes did not withstand the water stress conditions after flowering. Despite this, two treatments obtained results for various parameters.

- **15416 | English Language Coursebooks: Xplore 12 Vs. Link Up To You!**

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Coursebooks are the base of the English language curriculum and the most commonly used material source in the classroom, even though their use is a questionable issue as many think it impairs teachers from creating original materials that will motivate students and better match their needs. On the other hand, others classify them as maps teachers may check when they are feeling lost and struggling with timing and lesson planning.

However, even if one supports the existence and use of coursebooks, in order for these to be well implemented in the classroom a detailed coursebook evaluation ought to be conducted. This study should preferably be led by the teachers themselves, as they are the agents in constant contact with learners, and ones who are better equipped to understand their students' needs and wants, yet that is not always the case.

In Portugal, coursebooks are chosen by school representatives, and teachers are not always given the opportunity to share their opinion. Instead, they have to accept what is decided by the institution. Additionally, educators are encouraged and often required to use the coursebooks, which satisfies parents, who have spent money on a number of schoolbooks and expect their children to use them.

Schools also struggle with conducting a serious evaluation before making a decision, due to a number of variables such as time management. Nevertheless, considering that there is already a lot of information and strategies available, evaluators ought to follow in the footsteps of what has been previously attained.

This presentation aims to evaluate and compare two 12th grade coursebooks - "Xplore 12" and "Link Up To You!" - currently in force in state schools and decide which one matches students' current needs better, considering the significance of Intercultural Education in today's schools.

- **15417 | The principle of immutability applied in Portugal's matrimonial property law - Does it still make sense?**

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In light of the undeniable movement of privatization of Family Law, which has been growing in the past decades, does the maintenance of the immutability principle still make sense?

The spouses are two free and enlightened equals, whose joint will now dictates their matrimonial relationship and family life. Since the proclamation of equality in marriage, family is based on the agreement between the spouses, creating the so-called 'negotiated family'.

According to the principle of immutability, after the celebration of marriage, neither the prenuptial agreement nor the statutory property regimes can be altered. Within the European Union, Portugal can be seen as an exception regarding the application of the immutability principle.

In the first part of my presentation, I analyse the meaning of this principle and the rationale behind its enshrinement in Portuguese Family Law, which I briefly refer to.

I then try to deconstruct the arguments in favour of maintaining this principle, by proposing solutions to the problems often pointed out by the defenders of the immutability rule.

Although I undertook this presentation focusing on Portuguese Law, I also considered, under a comparative perspective, the solutions adopted in Germany, which are based on a total opposite premise. While the Portuguese legislator establishes the prohibition of freedom/mutability, as a general rule, the German legislator institutes contractual freedom as a principle, subject to a number of restrictions in specific cases.

Due to this principle, Portuguese couples are often compelled to get a divorce in order to pursue their best interests. A solution that is not at all consistent with the favor matrimonii attitude that the legislator frequently assumes. I, therefore, conclude that the principle of immutability is not in line with the private autonomy of the spouses, who should be allowed to adapt their patrimonial status to changes in their way of life and expectations.

- **15418 | Medical students' learning styles: the correlation with academic success and adherence to computer-assisted learning in anatomy**

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Introduction: Due to current medical curriculum reforms, the anatomy's pedagogical approach must be rethought, favoring the implementation of new pedagogical strategies, such as Computer-assisted Learning (CAL). This pedagogical strategy provides an insight into students' learning skills and concomitantly analyses their cognitive profiles, based on Learning Analytics principles, steering a personalized learning experience. Nonetheless, exploring and taking students learning styles in consideration is vital for designing a learning environment that potentiate the academic achievements of the learners. Thus, a study was conducted to evaluate the students' learning styles, as well as to evaluate the correlation with their academic success and adherence to CAL implemented in Anatomy.

Methods and Materials: Medical students enrolled in Musculoskeletal (MA) and/ or Cardiovascular Anatomy (CA) courses were distributed in three groups (MA group, CA group, MA+CA group). Students' learning styles were assessed through VARK questionnaire.

Results: No differences were found in the adherence to the CAL training according to learning style in the MA Group ($p=0,87$), CA Group ($p=0,79$) and MA+CA group ($p=0,56$). The learning styles adopted by the medical students showed evolution, since the second-year students showed more visual (6,9% vs 15,2 % $p<0,034$) and mixed learning styles (13,5% vs 22,6% $p<0,047$) in comparison with first year medical students. The students that showed failed in completing the course presented similar learning styles to the first year students.

Conclusion: The adherence to CAL training hasn't influence by the learning style, showing that the implementation of relevant pedagogical intervention in anatomy are adopted, independently of the learning approach. Also, medical students learning styles seem to change from the first to second year. The reticence in changing learning styles appear to be associated with higher failure to complete anatomy courses.

- **15421 | Memory and Place: the building of a poetic narrative**

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This study intends to evoke specific study cases as a way to question what defines a *house*. Casa Alves Costa by Álvaro Siza Vieira and Vill'Alcina by Sergio Fernandez were the first works I visited as a house and that really made me think differently about domestic architecture. Besides that, they reveal the desire to manipulate and reinvent the spaces that constitute a house through organization and materiality, just as Le Corbusier designs Cabanon and Villa Le Lac responding to the inhabiting needs with a perception of the scale that allows to create a domestic and intimate atmosphere in such a controlled space. The house could be interpreted as a skin that covers us when we need, in each space there is a certain dependence that in harmony with architecture can respond to our needs and pleasures.

The current paper intends to focus this research on the reflection of the house and dwelling in order to rethink the notion of *home*, connecting the construction and the atmosphere of each space, giving importance not only to the way of living of each person, but also the connection with the surrounding and the relation between person and place.

It is our objective to translate the main design themes announced by the architecture and atmosphere of each space, which, through the construction of a mental and photographic discourse, will underline the poetic narratives in play.

This study is part of an ongoing master thesis on Master's Degree in Architecture, at FAUP, 2018/19, under the supervision of Helder Casal Ribeiro.

- 15422 | The role of metallothioneins in tomato plants' response to Cr (VI) exposure

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Chromium (Cr) is one of the heavy metals (HM) with more associated environmental danger, mainly due to the high amounts released to the environment by several anthropogenic sources. Cr exists mainly in two forms, the trivalent [Cr (III)] and the hexavalent [Cr (VI)]. Although the first is considered a micronutrient for animals, neither form plays a role in plant metabolism. Cr (VI) is highly toxic to all living things, even at low doses. Its accumulation in soils is alarming, because in addition to being increasing around the world, Cr, like other HM, does not undergo any process of biodegradation. Thus, its accumulation in tissues of various crops can, on one hand, induce damage and breakages in agricultural production, but also pose a great danger to all those involved in the related food chains, including human beings. In this way, it is essential to understand the nefarious effects caused by Cr (VI) exposure on plants, as well as to characterize plant-activated defences against Cr (VI) phytotoxicity. In this study, the consequences of exposure of tomato plants (*Solanum lycopersicum* L. cv. Micro-Tom) to low Cr (VI) concentrations during five weeks of growth or to higher Cr (VI) concentrations only in the fifth week were evaluated. Biometric evaluation of these plants showed the existence of non-deleterious damages caused by Cr (VI). Quantification of Cr showed a higher accumulation in roots, revealing much lower levels in shoots and fruits. Gene expression analysis of metallothioneins, proteins with high metal affinity, revealed a differential induction by Cr (VI), suggesting an important role of these proteins in the defence against Cr (VI), directly by its chelation or indirectly, by the potentiation of the antioxidant defence, in an organ-dependent manner.

- 15423 | Witches, Histories & Sunai: Defining the Self in Victoria Schwab's Monstrous Worlds

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Victoria Schwab (1987), also known as V.E. Schwab, has created a fictional world of monsters. The worlds woven by Schwab are inhabited by literal and figurative monsters - from the streets of Verity, where creatures made of teeth and claws are born from violent acts, to the Archives where fugitive Histories can turn into violent assassins and injure their loved ones. Through the presence of the monster, Schwab explores the darkest corners of the human mind, reflecting on notions of the self and identity. In this paper I intend to discuss how Schwab uses monsters, as well as notions of "monstrosity" and "monstrous", to shape her character's identity, and to emphasize their humanity - after all, when one defines oneself in contrast to a monster, her/his humanity becomes an important part of the self. Regarding the discussion of the monster, and the concepts of monstrosity and monstrous, I will support my presentation with the works of Georges Canguilhem and of Jeffrey Jerome Cohen, editor of *Monster Theory: Reading Culture* (1996). Monstrosity and the monstrous will also be analysed in light of some key concepts, such as "double" and "uncanny".

- **15424 | DOXORUBICIN AND MITOXANTRONE EFFECTS ON THE BRAIN'S REDOX STATUS OF DIFFERENTLY AGED MICE**

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Doxorubicin (DOX) and mitoxantrone (MTX) are two chemotherapeutic agents with a broad spectrum of activity against neoplastic cells and their post-treatment toxicity has been proved in several organs. Data regarding their neurotoxicity is still scarce, being the term "chemobrain" used to refer the cognitive deficit effects of chemotherapy in the long term. This work aimed to evaluate the toxicity towards the brain of clinically relevant doses of DOX and MTX in male CD-1 mice with three different ages: infants (4 weeks), adults (3 months) and old (18-20 months). Mice received intraperitoneal administrations, twice a week, for 3 weeks. Control mice were injected with saline solution, MTX-treated groups received a total cumulative dose of 6 mg/kg, DOX-treated infant and adult groups received a total cumulative dose of 18 mg/kg, and old mice received a total cumulative dose of DOX 9 mg/kg. Mice were euthanized one week (adults and old) or seventeen days (infants) after the last injection. To evaluate the brain's oxidative stress, total glutathione (GSht), reduced glutathione (GSH) and oxidized glutathione (GSSG) levels were determined. In adult and infant mice, DOX (18 mg/kg) caused weight decrease after the last injection. In fact, as early as day 10, these DOX groups revealed lower food intake than their respective controls. Brain levels of GSht, GSH and GSH/GSSG ratio decreased in DOX adults. Nonetheless, MTX did not cause significant changes in brain glutathione levels in any tested groups. The presented data suggests that DOX causes distress in infant and adult mice and redox impairment in the brain of adult mice.

ARM and VMC acknowledge FCT for grants: SFRH/BD/129359/2017 and SFRH/BPD/110001/2015. This work was supported by FEDER funds [Operational Programme for Competitiveness Factors - COMPETE and by FCT within the project "PTDC/DTP-FTO/1489/2014 - POCI-01-0145-FEDER-016537"]

- **15425 | The effect of number of hours of training per week on the reaction rate.**

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Reaction velocity can be defined as the speed at which an athlete is able to respond to a stimulus in the shortest possible time, referring to all forms of movement. The aim of this study was to understand and verify if the number of hours of training per week has influence on reaction velocity in movement of female junior futsal athletes. Our sample consisted of 16 athletes from two different teams, with different hours of training, aged between 14 and 19 years. The first team (group 1) trained 2 hours a week and the other (group 2) trained 4 to 6 hours a week. Nelson's Speed of Movement Test (1965) was used to collect data (Total Motion Reaction Speed, Right Motion Reaction Speed and Left Motion Reaction Speed). The Mann - Whitney test in the IBM SPSS version 25 program showed that there were statistically significant differences between the two groups ($p < 0.05$), so we can conclude that the reaction time of the team with more hours of training is lower, compared to the team with fewer hours of training. The mean of the reaction speed in total moving for the group 1 is 1,67 and for the group 2 is 1,41. When the movement is to the right, the mean of the reaction speed for the group 1 is 1,67 and for the group 2 is 1,37. When the movement is to the left, the mean of the reaction for the group 1 is 1,67 and for the group 2 is 1,46. Therefore, it is concluded that the number of hours of training per week has, effectively, influence on the reaction speed in movement of the athletes.

Key-words: number of hours of training; reaction rate; junior athletes; female futsal.

- **15426 | "The effect of field position on the soccer athlete's two choice reaction time and attention"**

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Motor learning in football contains game situations that require permanent attention to the interactive bodies - players, ball, field - that depend on constantly changing coordinates and the anticipatory mental processing of fast movements (Silva, 2000). The reaction time in football represents a fundamental role because the athletes, being exposed to a very complex and constantly changing environment, need to systematically capture and absorb information and stimulus from different factors until they are able to elaborate a response according to the complexity of the game (Williams, 2000). Success, or failure, is very dependent on the ability of athletes to maintain their high levels of attention during the playing period. The objective of this study was to analyze two-choice reaction time and the attention capacity of soccer players of different positions in the field. The sample comprises 20 male soccer players, divided into two groups of different positions (attackers and defenders). It was applied the Nelson Choice-Response-Movement Test and the Trail Making Test (Part A and B). Statistical procedures included descriptive statistics, Mann-Whitney U test and Spearman's bivariate correlation ($p < .05$). When comparing results, were detected significant differences between field positions and the mean of parts A and B of the Trail Making Test, where better results were shown by attackers. In the remaining results, there was no significant difference. It is concluded that the attackers are better on attention capacity and the defenders are better on reaction time. Results that are the opposite of what was counterfeited.

Key-Words: FOOTBALL; REACTION TIME; ATTENTION; CONCENTRATION;

- 15428 | The African (-) American hyphenation: mapping racialized spaces and relations in Toni Morrison's Home

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The reading of Toni Morrison's works has been mainly centred on style, studies around trauma, spirituality, motherhood, and the history of the African American community. In this presentation, however, I would like to present a different approach. Using the conceptual tools of Spatiality Studies and the methodology of the Digital Humanities, I intend to create maps that can lead us to find new meanings and new readings to Morrison's novel Home (2012). It is important to bear in mind that, even though I will deal with physical spaces, space and place have two different definitions. While place has the physical dimension as its most important reference, spaces are socially constructed and include both physical and non-physical ones. Therefore, I intend to show on my presentation that the maps will allow us to perceive how black characters circulate through the different spaces presented in the analysis, focusing on what either allows or forbids them to do so. I would also like to show how their bodies are a crucial aspect of their (i)mobility and that their interactions with the physical spaces presented in the novel are of utmost importance to the new readings I will offer.

- **15429 | Adrenergic control of human macrophages polarization and its putative impact in cancer progression**

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A continued exposure to stress can result in a release of neuroendocrine messengers, namely the catecholamines, which may promote tumorigenesis and affect cancer treatments efficacy. Noradrenaline and adrenaline exert their effects through activation of G-protein coupled receptors, named adrenoceptors (AR). The β_2 -AR subtype has been particularly pointed as a tumorigenic receptor, immunomodulator and its expressed by several immune cell types, such as macrophages. Macrophages are one of the most abundant cells in the tumor microenvironment and they coordinate different stages of tumorigenesis such as immunosuppression. Macrophages may act as tumor suppressors (M1-like) or promoters (M2-like), depending on the microenvironment stimuli. Therefore, an adrenoceptor-mediated manipulation of macrophages phenotype may constitute an appealing alternative on cancer immunotherapy. The aim of this study was to understand if the β_2 -adrenoceptor activation influence of the human macrophage polarization and function. Therefore, human macrophages, derived from monocytes, were polarized by LPS to a M1-like phenotype or by IL-10 to a M2-like phenotype. The effect of isoproterenol (β_2 -AR agonist) on macrophage polarization and function was then evaluated by the appropriated methods. Interestingly, while LPS polarization promoted a pro-inflammatory profile, IL-10 polarized macrophages towards an anti-inflammatory profile. Notably, isoproterenol induced alterations on the expression of polarization markers, preventing an LPS-induced increase of pro-inflammatory markers. The transduction mechanism may involve, at least in part, the NF- κ B pathway, since Isoproterenol reduced p65 and I κ B α phosphorylation. In addition, was observed that isoproterenol enhanced the ability of LPS-polarized macrophages to induce cancer cell invasion. In conclusion, isoproterenol seems to impair LPS-induced pro-inflammatory phenotype, driving macrophages towards an anti-inflammatory profile.

- 15430 | “They like being enslaved!” “Harry Potter” and the British imperialist mentality

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"Harry Potter" is undeniably a very British saga. It is influenced by and reproduces a series of literary and cultural aspects of traditional British Literature, from the medieval *The Canterbury Tales* to the Victorian orphan hero. Since J.K. Rowling's books are deeply inserted in her country's culture, which is inextricable from its history and politics, to analyze certain elements of the narrative is to scrutinize aspects of the British history itself. Having that in mind, I will establish and explore in my presentation a relation between England's imperial mindset and the dominant wizarding society in the "Harry Potter" books. In order to do so, I will analyze the witches' and wizards' interactions with creatures of a lower rank in their social hierarchy, such as house-elves, goblins and centaurs. I will also identify which mechanisms, for instance, disseminated discourses and political structures, were created and used both by English colonizers and the fictional wizards to subjugate other peoples. Thus, through the close reading of selected passages and the conceptual tools of colonial and post-colonial theories, I intend to show the presentness of the British imperialist past in J.K. Rowling's works.

- **15434 | Antioxidant supplementation. A future way for delaying ovarian ageing?**

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A disturbance in redox homeostasis, with ageing, results in oxidative stress (OS). In the ovaries, OS is believed to be related with increased inflammation, fibrosis and tissue dysfunction. This study aimed at evaluating whether these features are age-related and if specific antioxidant treatment with a NADPH-oxidase (NOX) inhibitor (apocynin) could 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. Ovaries were collected and processed for histological and molecular studies. H&E, Sudan black and picosirius red (PSR) staining were used for histological examination and evaluation of fibrosis. NOX1 expression was assessed by immunohistochemistry. Protein carbonylation and nitration was evaluated by immunofluorescence. mRNA expression of collagen types, inflammation markers, matrix metalloproteinases (MMPs) and MMP tissue inhibitors (TIMPs) was determined by qPCR.

The ovarian structure of both mice groups was similar. However, a significant age-related reduction on the amount of primordial and primary follicles was noticed. Aged ovaries displayed more cysts and lipofuscin deposition in stromal cells, with enhanced fibrosis. Ovarian NOX1 expression was evidenced in oocytes and corpus luteum. Antioxidant treatment neither affect ovarian structure nor follicle number yet, it significantly reduced PSR staining. Protein carbonylation significantly increased with age though, nitration showed no alterations. Apocynin had no effect. Aging significantly increased mRNA expression levels of Col1a1; Col5a1; CCL5; TGF- β ; IL-1 β ; MMP9, TIMP1; TIMP2. Apocynin normalized their expression levels. Col3a1, TNF- α , MMP2 and MMP12 were not affected.

These findings indicate that OS and fibrosis are associated with increased inflammation and collagen deposition, contributing to an age-related decline in female fertility. Apocynin supplementation displayed several beneficial effects.

- **15435 | Exploring the role of uterine oxidative protein modifications in defective placentation**

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Emerging work indicates that an oxidative uterine microenvironment at the time of implantation may condition placentation by interfering with extravillous trophoblast functions.

Human placental bed samples and an extravillous trophoblasts immortalized cell line (HTR-8/SVneo) were used. Protein carbonylation was detected by OxyBlot and albumin carbonylation verified by immunoprecipitation. Albumin expression and localization was determined by PCR and immunohistochemistry. The effect of carbonylated albumin on cell viability, proliferation and adhesion was quantified with neutral red. Scratch assay and collagen-coated transwells were used to evaluate cell motility and invasion. Cell stress response signalling proteins were analysed by western blot.

A moderate correlation between total protein carbonylation and maternal age was observed at the placental site. A highly carbonylated 66 kDa protein (identified as albumin) showed strong positive and significant correlation with maternal age. Moreover, carbonylated/total albumin ratio correlated strongly and significantly with maternal age. Albumin mRNA expression was found at placental bed. Immunohistochemistry showed that it features preferentially endothelial cells and the connective tissue between muscle fascicles. Moreover, albumin is partially co-localized with carbonylated proteins. Carbonylated albumin (CHSA; 100–25 µg/ml) had no effect on HTR-8/SVneo viability and proliferation but motility was significantly reduced (24%). Long-term incubation with CHSA upregulated SOD2 ($1,7 \pm 0,2$) and triggered unfolded protein response as shown by an increase in PERK ($1,8 \pm 0,3$) and activation of eIF2 α (1.76 ± 0.88). Extracellular collagen matrix modified by CHSA reduced significantly trophoblast adhesion (16%) and invasion (18%) capacity.

Maternal ageing is accompanied by selective albumin modification, that may have a deleterious role in trophoblast function and interaction with its environment.

- **15439 | Mediators in the Relationship between Dating Violence and Exposure to Interparental Violence: a review of the literature**

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Dating violence is now widely recognized as a serious public health problem, since it affects the lives of millions of adolescents every year, has serious consequences on the physical and mental health of the victim, also because it occurs at a point in life where romantic relationships, and their patterns begin to establish.

Researchers have sought to empirically identify the various risk factors that enhance the likelihood of an individual engage in a loving relationship characterized by violence. One of the most studied risk factors in this context is exposure to interparental violence. The results are inconclusive, since a part of the empirical studies provide support for the possibility that exposure to interparental violence may act as a predictor of the perpetration and suffering of dating violence, but another rejects this possibility. Therefore, many researchers have advanced with explanatory models, in which a third variable acts as mediator of this relation.

In general, the current research seeks to review the different models of mediation that intend to explain the relationship between dating violence and exposure to interparental violence, and the variables that are proposed and tested in these same models. Moreover, it is intended to categorize the variables tested in the literature and proposes a model that can congregate these models and variables. For this review was used a variety of library and online database. The results showed that most of the mediator variables were only tested once, which has implications for the possibility of generalization of the relations obtained. Regardless, variables as "acceptance of dating violence" or "exposure to community violence" seem to have an important role on the explanation of the relationship between dating violence and exposure to interparental violence.

- **15443 | miR-99a negatively regulates osteogenic differentiation**

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Currently, treatments for osteoporosis consist predominantly in anti-resorptive drugs that inhibit/prevent bone resorption but are often associated with several side effects. Therefore, the need for new approaches to promote bone homeostasis and regeneration/repair of fragility fractures in patients with osteoporosis is increasing. Over the past years microRNAs (miRNAs), a class of small non-coding RNAs that coordinate virtually all cellular mechanisms, have gained status as important post-transcriptional regulators. Recent studies revealed their pivotal role in the pathogenesis of several human diseases, including osteoporosis.

In this context the aim of this study is to investigate the role of miR-99a-5p in osteogenic differentiation.

To achieve our aims, we firstly assessed miR-99a-5p expression profile during osteogenic differentiation in MC3T3 cell line and in primary human Mesenchymal Stem/Stromal Cells by reverse transcription - real-time quantitative polymerase chain reaction (RT-qPCR). Next, to analyze the biological effect of miR-99a-5p in osteogenesis and proliferation, we performed in vitro transfections of miR-99a-5p mimics and inhibitors.

The results showed that miR-99a-5p was significantly down-regulated during MC3T3 osteogenic differentiation and during early stages of human primary MSC osteogenic differentiation. miR-99a-5p overexpression in pre-osteoblastic cell line MC3T3 led to a decrease of osteogenic differentiation markers, whereas its inhibition enhanced osteogenesis markers, including alkaline phosphatase gene expression and staining. However, modulation of miR-99a-5p levels in MC3T3 cells did not impact proliferation.

Taken together, our data shows that miR-99a-5p is a critical regulator of osteogenic differentiation.

Acknowledgments: This project has been supported by FCT - in the framework of the project POCI-01-0145-FEDER-031402 - R2Bone, under the PORTUGAL 2020 Partnership Agreement, through ERDF.

- **15446 | Few-cycle laser for real-time nanomedicine research: towards innovative anti-cancer therapy**

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A prismless few-cycle Ti:sapphire laser oscillator, pumped by a solid-state laser at 532 nm, was built at the Femtolab (IFIMUP-IN and DFA-FCUP) and was temporally and spectrally characterized using state-of-the-art patented technology (d-scan, Sphere Ultrafast Photonics). This system is capable of delivering ultrashort laser pulses with 5 femtoseconds (fs) in duration and with an ultra-broadband spectrum centered at around 800 nm. This new laser system was then used to develop an application in the field of nanomedicine cancer research, in collaboration with the International Iberian Nanotechnology Laboratory (INL, Braga, Portugal), using a fluorescence lifetime Imaging microscopy method. Unlike most few-cycle lasers that provide a broadband but fixed spectrum, the new laser system can be spectrally shaped by adjusting its intracavity dispersion over a significant range. The resulting optimized broadband laser spectrum enabled the simultaneous excitation of endogenous markers (NADH/NADPH) in living cells that indicate the metabolic state of the cells while being exposed to innovative anti-cancer therapeutic drugs and/or nanodrug delivery systems. Here the well-known anti-cancer drug Doxorubicin (DOX) and a commercially available liposomal nanoformulation Doxil® encapsulating this drug, were studied on in-vitro HeLa cancer cells. The results allow us to confirm a possible biological response of the anti-cancer drug DOX in the analyzed cells, as a time dependent variation of fluorescence lifetime parameters is observed in the analysis. The experiments show that the technique can be used to study the effect of DOX on cellular bioenergetics of cells, when encapsulated in a nano drug delivery system (Doxil®), benefitting from reduced photobleaching, faster acquisition times, and minimal thermal effects when compared to techniques based on standard longer-pulse (~100 fs) lasers.

- **15447 | Economic Structure and Growth**

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The purpose of this study is to analyse the impact of the economic structure on economic growth, a question that brings together economic growth and development economics. In particular, we want to assess if a high specialization in some sectors, as opposed to a more diversified economy, influences the rate of growth of the economy. For the purpose of studying the relationship between the economic structure and economic growth, we developed a panel-growth-accounting model to test the hypothesis of the former affecting the latter. By using labour first-order condition, we assess the impact of economic structure on wage growth. Our results, using value-added data, indicate that a more diversified economy, as opposed to a more specialized one, positively impacts on wage growth. To examine the contribution of the economic structure to wage growth in more detail, we applied the same model to several subsamples of the data, either considering different geographic groups, income levels and export clubs. The impact of economic structure on wage growth it's only significant for the aggregate of Europe and Central Asia and North America, which is not consistent with our finding that economic structure has a higher impact on low-income countries. Regarding export clubs, the results show economic structure to have a significant impact either for exporters of petroleum and in the case of exporters of minerals and mining products. However, while for exporters of minerals and mining products the effect is negative - a more diversified economy is associated with a higher grow - which can be thought in the line of 'resource curse' literature -, for the exporters of petroleum it is exactly the opposite with specialization positively affecting wage growth. Economic complexity does not appear to be a significant explanatory variable of wage growth.

- **15449 | Repurposing non-antibiotic drugs for antimicrobial purposes**

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Antibiotics are medicines used to prevent and treat bacterial infections and they are the most successful chemotherapeutic agents known. However, over the past few decades, excessive and indiscriminate use has led bacteria to develop resistance mechanism to antibiotics. In addition, there is a strong evidence that 80% of human infections are caused by sessile microbial communities named biofilms, because they are less susceptible to host defenses and highly resistant to antimicrobial agents when compared to equivalent planktonic cells. There are several evidences that biofilm resistance is multifactorial as it is conferred by several factors like the ability to overexpress efflux pumps. The main purpose of this study was to evaluate the action of piroxicam and diclofenac, non-steroidal anti-inflammatory drugs (NSAID's), against biofilms of *Staphylococcus aureus* and *Escherichia coli*, through a strategy of drugs repurposing. Initially, it was evaluated the ability of this non-antibiotic compounds (NSAID's) to potentiate the antimicrobial activity of two broad spectrum antibiotics [kanamycin (30 µg/disc) and tetracycline (30 µg/disc)] commonly used for the treatment of bacterial infections, by disc diffusion method according to the guidelines of Clinical Laboratory Standards Institute (CLSI, 2015). The concentration of piroxicam (4 mg/mL) and diclofenac (30 mg/L), selected to be tested, were those used in clinical for human patients treatment. Then, in order to evaluate the effect of both NSAID's as efflux pump inhibitors, the Ethidium Bromide (EtBr) accumulation test was performed. The first results shows that piroxicam and diclofenac had a inhibitory effect against subpopulations of *Staphylococcus aureus*, but only diclofenac has an inhibitory effect against *Escherichia coli*. Besides, it has been found that piroxicam and diclofenac have no effect on the potentiation of antibiotics.

- **15450 | Evaluation of microbiological quality of lettuce sanitized by two different methods and exposed to different times and temperatures of storage in food service units**

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The association between fresh vegetables, commonly served by Food Service Units (FSU), and foodborne diseases led to an increasing awareness of consumers and catering for food safety issues. However, studies on sanitizing methods applied in a real catering context are still scarce. The aim of this study was to evaluate the microbiological quality of lettuce after washing by two methods and storage in salad bars.

We included 96 lettuce samples collected in two FSU after washing (t0) by sodium hypochlorite NaClO-90ppm/5min or tap water and at the beginning and ending of storage on salad bars (lunch-t1/t2, dinner-t3/t4, supper-t5/t6). Microbiological quality was determined by reference methods for enumeration of total viable count (TVC), Enterobacteriaceae/37°C, *Listeria*, *E. coli*, *C. perfringens*, *B. cereus*, *L. monocytogenes*, coagulase-positive-Staphylococci as well as *Salmonella* detection. Non-parametric statistical tests were used (95% confidence interval).

Samples from t0 showed lower TVC and Enterobacteriaceae loads in lettuces washed with NaClO comparing to tap water (higher number classified as borderline-B). At lunch (t1/t2), TVC and Enterobacteriaceae loads were significantly lower in samples washed with NaClO than the ones washed with tap water ($p < 0.05$), resulting in high number of unsatisfactory (US) samples. At dinner and supper (t3-t6), the microbial loads of these parameters were significantly higher ($p < 0.05$), regardless of the method used, and most above US limit. This study also shows that TVC and Enterobacteriaceae loads didn't increase significantly ($p > 0.05$) during the 2.5 hours exposure on salad bars. All samples were satisfactory for the other parameters performed, except for coagulase-positive-Staphylococci ($n=2/US$) and *Listeria* ($n=1/B$).

Overall, this study showed that washing with NaClO was more effective than using tap water, and that storage of washed lettuce under refrigerated conditions for future consumption was not recommended beyond lunch

- [15452 | Characterization of Reports on Payments to Governments \(RPG\) \(Relatório de Pagamentos às Administrações Públicas - RPAP\) prepared by the supporters of the Extractive Industries Transparency Initiative \(EITI\)](#)

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Corruption and poor tax behavior are problems that have generated great concern to companies around the world (Joseph et al., 2016). This problem occurs on a large scale in developing countries, rich in natural resources but with a tendency to have a weaker economic growth, marked by political and social instability, high levels of poverty, and corruption both in public and private sectors. The implementation of transparency of companies' payments and receipts by governments is seen as one of the most effective ways to reduce corruption (Halter et al., 2009), tax evasion and fraud (Sikka, 2018).

The issue of transparency is central to the pursuit of sustainable development (Mol, 2010) and has generated numerous efforts by various governmental, non-governmental and business organizations. One of the significant developments within this area was the creation of legislation that requires companies in the extractive industry sector or the exploitation of primary forest to publish, in the form of a report, the payment information to public administrations in the countries in which the companies operate.

This exploratory study aims at identifying and characterizing, through the analysis of the content of each Report on Payments to Governments available on the websites of the 59 companies that collaborate with the Extractive Industries Transparency Initiative, which are the reports that can be considered to be the best examples. This study aims to analyze the quality of each Report on Payments to Governments and to identify the differences between each report and the reasons behind such differences.

- **15453 | TOXICITY OF MIXTURES OF CYANOBACTERIA EXTRACTS AND MICROPLASTICS TO DAPHNIA MAGNA**

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Cyanobacteria are photosynthetic prokaryotes able to produce secondary metabolites. Some of these are bioactive and toxic. *Microcystis aeruginosa* is a very common and well studied cyanobacteria, present in several freshwater ecosystems. It is able to produce microcystin toxins. Among these, the microcystin-LR is the most common, toxic and well studied of the 250 variants already known.

Microplastics are small particles up to 5 mm that are considered global pollutants (air, water, sediments and soils). They are also contaminants of human food products (e.g. seafood, table salt, honey, among others). Microplastics are very diverse, including in relation to shape, size, polymer type and other characteristics. The microplastics present in the environment generally contain other chemicals (incorporated during their manufacture, use and environmental permanence) and in several circumstances they are also colonized by microorganisms. Moreover, microplastics are able to interact with the toxicity of other pollutants.

Microcystin-LR and microplastics co-exist in many aquatic environments, and toxicological interactions in organisms simultaneously exposed to them may occur. Thus, the main objective of this study was to investigate the effects of induced by mixtures of *M. aeruginosa* extracts (containing microcystin-LR) and microplastics on the crustacean cladoceran *Daphnia magna* which has been widely used as model in Ecotoxicology and more recently also as model for the pre-screening of chemical toxicity to humans.

Acute and chronic bioassays with *D. magna* were carried out following the OCDE guidelines 202 and 211, respectively. The extracts, microplastics and their mixtures caused mortality, reduced growth and reproduction in *D. magna*. Furthermore, toxicological interactions were found. These findings are discussed in relation to ecosystem function and services provided to the Society, and implications to human health and wellbeing.

- **15455 | Relationship between diet and fecal biochemical characteristics of colorectal cancer in prediabetic and obese individuals**

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Introduction: Colorectal cancer is the second leading cause of death related to cancer in the world. Since the majority of colorectal cancer incidence is diet-driven it is important to focus on effective methods and risk biomarkers to prevent the occurrence of this disease. Regarding colonic luminal environment, a healthy stool, which protects the intestinal mucosa against carcinogenic compounds, has been characterised by having higher concentration of fecal short chain fatty acids, lower pH and lower fecal concentration of ammonia.

Aims: The aim of this study is to understand the relationship between eating habits and three fecal putative biomarkers of colorectal cancer risk in pre-diabetic and obese participants of the PREVIEW (PREVention of diabetes through lifestyle Intervention and population studies in Europe and around the World) trial, in New Zealand.

Methods: A cross-sectional study was conducted based on 4-day food reports and 3-day fecal samples of 74 participants. The main outcomes, short chain fatty acids ($\mu\text{mol/g}$ feces), ammonia (mmol/g feces) and fecal pH, were correlated with nutritional and anthropometric data using Pearson and Spearman coefficients.

Results: A significant association was found between the three main outcomes showing that fecal short chain fatty acids was inversely associated with both fecal ammonia ($P=0.001$) and fecal pH ($P<0.001$) while fecal ammonia was positively associated with fecal pH ($P=0.036$). A higher fibre (g/MJ) and carbohydrate ($\text{EI\%}$) intake was related to a greater fecal short chain fatty acid concentration.

Conclusion: This study shows that a higher consumption of fibre and carbohydrates is associated with a higher concentration of short chain fatty acids in the stool, which suggests a healthier colonic environment. The potential applicability of these three fecal biochemical characteristics as indirect biomarkers of the risk of developing colorectal cancer is yet to be fully clarified.

- **15462 | Food choice determinants and body mass index among University students**

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University is a critical period that may influence students eating behaviours. Several changes in food patterns have been described among university students. Therefore, the aim of this study was describe the main determinants of food choice among university students and to investigate their relation with BMI and self-perceived health. Food choice determinants were evaluated using a questionnaire and information on reported weight and height were collected in a total of 397 university students enrolled at the University of Porto (62.5% women; ages from 17 to 36 years). The mean BMI was 22.11Kg/m² and no differences were found between sexes (p=0.335). Food choice determinants reported by higher proportion of participants were "trying to have a healthy eating pattern" (47%), "flavour" (44%), "quality or freshness" (38%), "price" (37%) and "routine" (35%). Higher BMI values were associated with reporting "food or package presentation" (r=0.109, p=0.038) and "following a prescript diet" (r=0.134, p=0.011) as food choice determinants.

With this work, we can conclude that among university students the most reported food choice determinant was trying to have a healthy eating pattern and that some determinants might be influenced by BMI. Further studies should aim at studying the effect of other life style parameters on food choice determinants among university students in order to fully understand what can affect these choices.

- **15465 | Fashion Wearables: Effect of UV on e-Textiles**

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In the Internet of Things Era, wearable devices that consist on smart or electronic devices incorporated on clothes (or as implants and accessories in our body) are expanding. The vast group of wearable technologies includes fashion electronics which combines aesthetics features with functional technology, presenting enormous advantages in the daily routine of society [1]. In the fashion world, a new trend emerged, where textiles are modified with functional carbon-based nanomaterials (CN) to impart a unique combination of chemical and physical properties, such as electrical conductivity and optical properties [2]. This new electro-photo-textile generation presents diversified applications such as for automotive, entertainment or safety [3]. This work is focused on the preparation of functional CN, their incorporation on textile substrates and production of dual function photo-supercapacitor textile devices (fig. 1). The electrochemical analysis through measurements of cyclic voltammetry, galvanostatic method and electrochemical impedance spectroscopy allowed determining the internal resistance and specific capacitance and revealed the electrical double layer capacitive behavior of the devices. The influence of UV light exposure with different wavenumbers ($\lambda = 254$ and 365 nm) on the energy density and power density parameters was analyzed in order to understand the performance of the devices. This type of device is a revolutionary promise to the world of fashion and electronic smart textiles.

Acknowledgments. Work funded by FCT/MEC and FEDER under Program PT2020 (PTDC/CTM-TEX/31271/2017 and UID/QUI/50006/2013-POCI/01/0145/FEDER/007265). JST thanks REQUIMTE/LAQV for a BI grant. RSC and CP thanks FCT for MSc. grant and FCT Investigator contract in the framework of IF/01080/2015.

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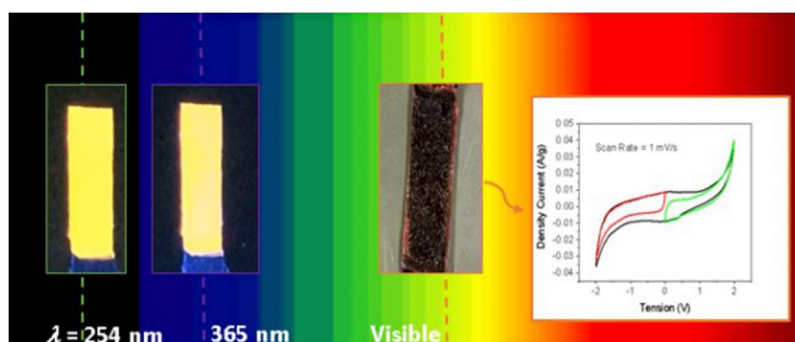


Fig. 1 - Textile supercapacitor response to UV and visible light and cyclic voltammogram under visible light.

- **15467 | Variation of simple and two choice reaction time and concentration in different trimestres of birth in soccer athletes**

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In the domain of sports the importance given to the date of birth has been growing. This indicator seems to be very important and often determining in the career of an athlete. If we look at the dates of birth of high performance professional athletes, we see that most of them have a birthday in the first six months of the year. Our study aimed to understand the effects of birthday date (first vs fourth trimester) in simple reaction time (SRT), two-choice reaction time (TCRT) and attention (At) in soccer athletes. The sample comprises 16, thirteen years old male athletes, eight from the first trimester and eight from the fourth trimester. Statistical analysis was performed using the IBM SPSS Statistics 25 and procedures included descriptive statistics followed by the Mann-Whitney U test with a significance level of 5%. The main results were: (i) in the first trimester athletes, there were significant correlations between the values of two-choice reaction time (TCRT) in the right side and preferred hand (PH) values and between the reaction values of PH and non-preferred hand (NPH) ($r=-0.762$; $p=0.028$ / $r=0.905$; $p=0.002$, respectively), (ii) in the first trimester athletes there is no significant relationship between the other variables, (iii) in the 4th trimester athletes there were significant correlations between the values of reaction rate of choice (left side) and the values of attention and between the values of TCRT of PH and NPH ($r=-0.714$; $p=0.047$ / $r=0.929$; $p=0.001$, respectively), (iv) in the fourth trimester athletes there is no significant relationship between the other variables. The main conclusion of this study was based on the fact that there were no significant differences in attention, simple reaction velocity and TCRT between first and fourth trimester athletes.

Keywords: reaction time, young soccer players, attention, youth, speed reaction

- **15468 | Development of communicative competences in Portuguese for everyday life situations: a case study at the University of Valencia**

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Among other motivations, to be able to communicate in and through a language, especially in daily life circumstances, is surely one of the main goals for any learner of a foreign language. However, the context of a non-immersive reality sometimes does not help the practice of communication and, in most of the cases, learners only have the classroom environment to acquire communication skills, and that is obviously not enough. Therefore, alternatives to this scenario can be created, such is the case of conversation groups, like the ones that have been implemented at the University of Valencia (Spain). There, with the help of beginner-level students of Portuguese, this action-research project reflects about teaching and learning experiences, focusing on the development of communication skills: listening, understanding and interacting in everyday life situations. For this, we used some methodologies and teaching strategies, such as game and simulation, to recreate and prepare the students for real-life situations in Portuguese.

- **15470 | Effects of a plyometric training on rugby players over 12 weeks**

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Background: The performance in rugby is dependent on the strength levels of each athlete, in which the explosive power plays a key role.

Objective: To assess the effect of a plyometrics training over 12 weeks in young rugby players.

Sample: 33 male rugby players, divided into an experimental group (GE) who performed 2 complimentary sessions of plyometrics per week (μ : 16 years $\pm$ 3 months) and control group (GC) that did not perform any session (μ : 16 years $\pm$ 4 months).

Results: There was a significant improvement at the end of 12 weeks in the following tests: Vertical Jump (SV) ($t=-6,92$; $p<0,01$), Horizontal Jump (SH) ($t=-5,09$; $p<0,01$), Horizontal Jump right (SH1AD) ($t=-3,93$; $p<0,01$) and Horizontal Jump left lower limb (SH1AE) ($t=-4,55$; $p<0,01$), Triple Jump right (TS1AD) ($t=-5,99$; $p<0,01$) and Triple jump left lower limb (TS1AE) ($t=-3,57$; $p<0,01$), Medicine Ball Frontal throw (LF) ($t=-7,14$; $p<0,01$), Ten steps Jump ($t=-3,88$; $p<0,01$) and Medicine Ball Back throw (LD) ($Z=-3,20$; $p<0,01$) in GE and in the SV ($t=-3,75$; $p<0,01$), SH ($t=-3,80$; $p<0,01$), SH1AD ($t=-2,60$; $p<0,05$), SH1AE ($t=-2,40$; $p<0,05$), LF ($t=-4,57$; $p<0,01$) and LD ($Z=-2,81$; $p<0,01$) in GC. When comparing the values accomplished by the dominant and the non-dominant lower limb between GE and GC, statistically significant differences were observed in the SH1A for the dominant ($T=-4.28$; $p<0.01$) and for the non-dominant lower limb ($T=-4.168$, $p<0.01$) as in the TS1A test for the dominant ($T=-6.05$, $p<0.01$) and for the non-dominant lower limb ($T=-3,45$; $p<0,05$) in GE.

Conclusions: (i) there was an evolution of the results obtained in the initial moment, both in the evaluation of jumps and of the throws; (ii) the plyometric training induces improvements in strength levels; (iii) the plyometric training had no influence on speed levels; (iv) athletes who perform plyometric training have a greater ability to carry body weight on a single lower limb; (v) there was an improvement in strength levels in both the dominant and non-dominant limbs.

- **15471 | Trade of ornamental fish as a pathway of alien species in Matosinhos, Porto**

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Biological invasions, though often accidental, are usually connected to human economic activities, having great economic impact, along with potential severe threats to ecosystems. Such threats may occur either through direct competition or predation or by acting as vectors for parasites and pathogens, posing risks to native species and human health. The trade of ornamental species can thus be considered to play a significant role in the introduction of non-native species and therefore this activity needs to be addressed in the prevention of biological invasions. With this aim, our research focused on screening and assessing the aquatic organisms available for sale in Matosinhos, in both their diversity and recognised invasive potential. Furthermore, the knowledge and attitudes of pet shop owners/managers regarding alien species were characterized with the support of a questionnaire, along with the identification and counting of all specimens for sale. A total of twelve stores were surveyed, and eleven out of twelve allowed the screening of specimens available for sale. About 100 taxa were identified, of which the most frequent and abundant, are characterized as having invasive characteristics. In what regards the knowledge of owners, although 83% (n=10) already knew the term “alien species”, less than 25% (n=2.5) were able to associate these species with ecological damages. Even more, 75% of them (n=9) admitted to have already been contacted by clients looking to dispose of unwanted animals. Our results support that despite being the main source of information for a number of consumers, pet shops owners are largely unprepared to advise correct practices regarding alien species and that a number of potentially invasive species are still widely available for sale. With this work it is expected to awake authorities to the need of improving available legislation and ensuring its implementation, in order to effectively manage and prevent biological invasions.

- 15474 | In-water vertical jump in young and senior male water polo players (the INEX project)

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As water polo players often need to move and sustain their body out of the water when performing shoots or preventing a passing ball from the opponents, the vertical jump constitutes an essential technical skill in this sport. The purpose of the current study is to characterize the in-water jump height achieved by two water polo teams of different age groups. Male water polo players from the Portuguese senior national team and from the North of Portugal Swimming Association team ($n = 22$ vs 46 , with 24.4 ± 6.7 vs 13.5 ± 0.3 years old, 84.4 ± 12.8 vs 54.6 ± 9.8 kg and 184.0 ± 0.7 vs 161.9 ± 8.2 cm) performed four vertical jumps (being considered for analysis the best trial). Players were instructed to jump the highest possible and touch a graduated board suspended at 60 cm above the water surface with their preferred hand. Players were on the side and beneath the board, in basic water polo position, jumping without any solid support (only using lower limbs propulsive techniques). A video camera was used to check the jumping height whenever needed. Relative jump was also calculated (as the ratio between the absolute jump height and the distance from hip joint to fingertip multiplies by 100), in which 100% means that the player raises his hip to the water surface level in the jump. As data distribution was not normal, the Mann-Whitney non-parametric test for independent samples was used to compare groups (the level of significance was maintained at 5%). Results revealed a significant difference between groups, with national players jumping higher than young and less experienced players (146.3 ± 7.7 vs 116.3 ± 9.0 cm and 104.5 ± 6.9 vs 88.1 ± 6.4 %). Although this is an ongoing research, involve many other variables both from the physical but also technical and tactical domains, from the current data it could be concluded that the observed discrepancy between age groups can be explained by senior players higher training/competitive experience and technical proficiency.

- **15478 | Tethered force and lactate changes during taper**

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Swimming training load induces acute fatigue and an expected chronic change in several physiological variables, causing a positive impact on swimmers' competitive performance. Considering training plans, to improve performance in competitions of high relevance, a competitive period of gradual load reduction and intensity adjustments (the taper) should be conducted. The aim of the current study was to assess the effect of the taper on swimmers' strength and lactate production. Fifteen young competitive swimmers, nine males and six females (12.82 ± 0.58 vs 12.08 ± 0.69 years old, 48.33 ± 9.53 vs 46.68 ± 7.27 kg and 1.57 ± 0.09 vs 1.54 ± 0.06 m) with five years of competitive experience, performed a 30 s tethered front crawl test before and after one week of taper (first macrocycle). Maximal and mean forces, fatigue index, variation coefficient of the mean force were measured using a load cell system (attached to a 5m long steel cable connected to the swimmer through a belt). The load cell was connected to a Globus Ergometer (Globus, Italy) data acquisition system that exported the data in ASCII format to a PC. Blood lactate concentration was determined during rest and the final of the exertion by puncture of the index finger using the analyser Lactate Pro (Arkay, Inc). The number of upper limbs cycles was assessed using video image capture. To compare the differences between the pre and post-taper variables, a Student's t-test of repeated measures was used. Maximal force (145.65 ± 42.50 vs 221.23 ± 57.90 N) and coefficient variation of mean force (63.77 ± 47.44 vs 159.89 ± 72.02 N) increased after the taper. The values of lactate after exertion (6.39 ± 1.04 vs 5.88 ± 1.35 mmol/L) were similar. We can conclude that the taper potentiates swimmers' maximal strength and do not change the post exercise blood lactate concentrations.

KEY WORDS: SWIMMING; BIOMECHANICS; TAPER; TETHERED FORCE; LACTATE

- 15479 | The host society as schoolbook complement: Portuguese as a Second Language study case

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The Portuguese social reality has been suffering numerous changes along the years, being one of the main causes related to the significant wave of immigration established. In fact, with the growing number of citizens from various parts of the world speakers of a native language that differs from the Portuguese, it becomes urgent the need to provide a broad integration of these citizens, allowing them access to the citizenship and to their personal and professional development.

This internship report proposes thematic treatment such as: task-based language teaching using significative tasks not only based on structural learning, but in meaningful learning for a purpose, the Português XXI 2 schoolbook exhaustive analysis using grids in order to check its effectiveness as a pilar in Portuguese learning and its role as an aid, or not, in integrating learners in the Portuguese society, human rights and the role of the host society in relation to the process of integration of adult and non-native individuals, awareness about human rights using a board game as well as other activities performed in real communicative situation between the students and native speakers, and the host society as a factor of integration (institutions, services, ...) by connecting them in order to provide a broader development not only of communicative skills in the target language, but also the skills essential to the exercise of their rights and duties as citizens.

Thus, the process of integration of adult non-native immigrants in Portuguese society presents itself as central. In fact, it will be possible to observe the presence of this concern both in the theoretical framework as in the description of the activities carried out with a group of immigrant learners.

- **15481 | 3D printing of poly(ϵ -caprolactone)/carbon-based nanofiller composite scaffolds for antimicrobial biomedical applications**

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Implantable fibrous scaffolds-associated infection and consequent failure is a severe health issue, which can result from bacterial adhesion, growth and biofilm formation at the implantation site, ultimately leading to sepsis and patients death. Some carbon-based nanofillers (CBNs) have been described as potential antibacterial compounds when immobilized and exposed in a composite polymeric matrix. [1]

The main goal of this work was the development of novel biocompatible fibrous scaffolds with improved antimicrobial properties. For that, layer-by-layer organized composite scaffolds of a CBN mixed with poly(ϵ -caprolactone) - PCL - were produced by 3D printing, using wet-spinning combined with additive manufacturing (AM).

Scaffolds were evaluated regarding the nanofiller exposure, antibacterial properties and ability to adhere human cells.

Scanning electron microscopy revealed that nanofiller exposure on the fibers surface increased when higher concentrations were used in the composite ink.

Antimicrobial properties were evaluated by fluorescence microscopy through live/dead assays performed with *Staphylococcus epidermidis*, a bacterial species commonly found in infected implantable devices. The 2h and 24h adhesion assays to the composite scaffolds revealed a time-dependent bactericidal effect in the presence of the nanofiller, showing death rates of adherent bacteria of 75% after 24h.

In vitro biocompatibility of the produced scaffolds towards human fibroblasts (HFF-1) was shown by F-actin spreading in the adherent cells. Cell stretching after 7 days of culture was evident in all scaffolds, independently of the nanofiller presence.

Overall, this work demonstrates the potential of the developed nanofiller-containing fibrous scaffolds to be used as biomaterials that hinder bacterial infection, while maintaining human cells adhesion.

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- **15482 | Embedding Intelligence To Robot Simulation**

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An efficient and effective way of implementing and testing Artificial Intelligence in robotics is the use of robot simulation systems. Robot simulation systems allow you to design, program and analyse robot behaviour, as well as test algorithms, perform tests and train artificial intelligence systems using realistic scenarios with cost and time considerably reduced. Most of the robot simulators require a controller. In this work we intend to embed "intelligence" in the robot itself, making it capable of deciding its own path through self-programming. In order to do that we will integrate a Partial Order Planning (POP) algorithm into the webots tool.

Webots is a development environment created by Cyberbotics Ltd used to model, program and simulate mobile robots, providing the user with the possibility to create virtual worlds in 3D and add passive and/or active objects, the latter being mobile robots that can be programmed according to the desired behaviour.

Artificial Intelligence Planning is a branch of Artificial Intelligence aimed at developing algorithms that give robots the ability to make their own decisions from planning. Planning consists in choosing and executing a sequence of actions in order to achieve a goal.

Partial Order Planning is an algorithm that from a set of actions, solves the goal from an initial state. The robot itself, in this way, can self-program, generate its action plan and execute it, without the intervention of a superior or controlling element.

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- **15484 | Temporal modeling of the incidence rate of tuberculosis**

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Background: Tuberculosis (TB) is an infectious and contagious disease that, although ancestral, is still the ninth leading cause of death worldwide. Despite the decrease in TB incidence in the last 10 years, Portugal has one of the highest TB rates in Europe, with 18 cases/100 000 inhabitants. Seasonal variation of TB incidence in Portugal has already been suggested, however, recent epidemiological changes may have altered this pattern. The aim of this study is to evaluate seasonal patterns in tuberculosis incidence and to investigate the effect of climatic variables - precipitation, temperature and relative humidity - on those trends, in Portugal, from 2009 to 2016. The TB data belongs to Sistema de Vigilância da TB em Portugal (SVIG-TB) and refers to the diagnostic date. The climatic variables belong to Instituto Português do Mar e Atmosfera, IP (IPMA, IP).

Methods: The data for the study contemplates incidence of TB and other variables in a monthly frequency and has the district as its spatial unit. We made a longitudinal analysis using Generalized Addictive Mixed Models (GAMM) for counting data, including the time as explanatory variable, a cyclic spline in the linear predictor to reflect the periodic character of the several months of the year, and random effects to account for the variability in rates between districts.

Results: A total of 19192 TB cases were reported during the study period. We verified seasonal trends of the incidence of TB and a cyclical pattern was detected every 12 months, with a high peak in the months of April or July, varying from year to year, and a low peak in December. We verified also that the explicit presence of time in the linear predictor annihilated the influence of any other climatic variables that were included in the model.

- **15485 | BMI, waist circumference and waist-to-height ratio in Portuguese children**

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Aims: To define obesity distribution according to body mass index(BMI) and relate such data to the measures of waist circumference(WC) and waist-to-height-ratio(WHtR).To evaluate the classification differences between these 3 measures of adiposity.**Methods:** Participants were taken from the national representative sample of the IAN-AF 2015-2016 survey, including 483 children aged 3 to 9 years old.Objective anthropometric measures of weight, height and waist circumference were obtained. The general adiposity was defined by BMI according to World Health Organization (WHO) growth charts for children. Abdominal adiposity was defined by $WC \geq P90\%$ according to McCharthy, and by $WHtR \geq 0.5$ according to Ashwell. Prevalence estimates and confidence intervals (95%CI) were weighted according to the sampling design. Cohen's k was used to analyse the strength of agreement between the 3 measures.**Results:**The prevalence of overweight according BMI was 31.5%(pre-obesity: 21.5% and obesity 10.0%), higher in girls (33.6%) than in boys(32.8%). BMI showed a classification discrepancy of 15.1% with WC and of 27.5% with WHtR, respectively, a moderate ($k=0.649$; $p<0.001$) and a weak agreement ($k=0.358$; $p<0.001$). The prevalence of abdominal obesity is similar for WC(33.0%) and WHtR(33.5%). A weak agreement between WC and WHtR was found($k=0.418$; $p<0.001$), where 26.1% of children were differently classified. In both measures the prevalence of abdominal adiposity was higher in boys (33.5% WC and 36.3% WHtR) than in girls (32.4% WC and 30.6% WHtR).**Conclusion:**Prevalence of abdominal adiposity was higher than general adiposity. Girls had higher general adiposity and less abdominal adiposity. BMI classification showed higher agreement with WC than with WHtR. **Acknowledgements:** IAN-AF funding: EEA-Grants Program, Public Health Initiatives (PT06-000088SI3);Institutional support:General-Directorate of Health-DGS, Regional Health Administration Departments and Central Administration of the Health System-ACSS

- **15486 | Maximal Bifix Decoding of Recurrent Sets**

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Given a word w of a certain set of words S , we denote by $e(w)$ the number of pairs of letters (a,b) such that awb is in S , by $l(w)$ the number of letters a such that aw is in S and by $r(w)$ the number of letters a such that wa is in S . We say that a word w is weak, neutral or strong, if $e(w)$ is, respectively, less, equal or bigger than $l(w)+r(w)-1$. We also associate to each word of S a graph (which is called the extension graph), based also on the possible extensions of the word in the set. If the extension graph of every element of a given set of words is acyclic or a tree, then we say that the set is, respectively, acyclic or a tree. Our main result is that a recurrent set S that has only a finite number of strong words (which includes recurrent acyclic sets), is in fact uniformly recurrent. We apply this result to study properties of maximal bifix decoding of acyclic sets and to solve an open question of Berthé et al. (2015) (article [1]), namely whether the maximal bifix decoding of a recurrent tree set is a recurrent tree set.

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- **15488 | Differential role of methylprednisolone on GABA and Glutamate release from isolated nerve terminals of the rat hippocampus**

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Corticosteroids exert a dual role by acting via (1) intracellular receptors, leading to slow genomic responses, or (2) membrane-bound receptors, operating fast responses. In neuronal cells, corticosteroids may affect ion currents and neurotransmitters release through yet undefined mechanisms. Corticosteroid receptors are highly enriched in the hippocampus, a brain region involved in learning and memory that is highly affected by ischemia and epilepsy. This prompted us to investigate the effect of methylprednisolone (MP) on GABA and glutamate release from hippocampal nerve terminals (synaptosomes) of adult rats. MP (0.3mM) facilitates [14C]Glu release equally from resting and depolarized nerve terminals, without significantly affecting the synchronous [3H]GABA outflow. The mechanism underlying facilitation of [14C]Glu release by MP (i) occurs within a few minutes (non-genomic), (ii) is not significantly affected by the depolarizing agent (15mM KCl vs. 5μM veratridine), (iii) is dependent on extracellular Na⁺, but is little affected by changes in extracellular Ca²⁺, (iv) involves the reversal of DL-TBOA-sensitive EAAT transporters, and (v) depends on activation of membrane-bound glucocorticoid (GR) and mineralocorticoid (MR) receptors sensitive to mifepristone (500nM) and spironolactone (500nM), respectively. Contrariwise, blockage of the ATP-sensitive P2X7 receptor with A-438079 (3μM) attenuated MP-induced [3H]GABA outflow from depolarized synaptosomes in low Ca²⁺ conditions, without affecting the [14C]Glu release. Thus, strengthening GABAergic inhibitory neurotransmission, without affecting Glu release, by P2X7 receptor activation in the presence of corticosteroids may only become apparent during paroxysmal neuronal firing where extracellular Ca²⁺ is low, as observed during epileptic crisis.

Work supported by FCT (UID/BIM/04308/2016).

- **15491 | Evaluation of food waste in families living in Porto.**

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In Portugal it is estimated that about 17% of the edible parts of food produced for human consumption are lost or wasted throughout the food chain until reaching the consumer, representing 1 million tons per year. Families' waste at home represents an important part of this amount.

This research had the objective of evaluating food waste of the families residing in the city of Porto, identifying which foods are more wasted and the main reasons associated. The methodology applied was based on a quantitative approach, through an online questionnaire survey, including questions to perceive consumer behavior through 4 groups of questions: habits of purchase and consumption, frequency of food groups consumption, ideas about waste and socio-demographic data. There were received 583 valid questionnaires.

Over 50% of respondents reported to never throw away food leftovers. 70% reported that if there is any leftovers, that they usually freeze items to use in another occasion. It was also noticeable that the most wasted foods were oils and fats 13.7% and pre-cooked foods 7.7%. Therefore, families involved in this study seem to be quite sensitive to the problem of waste, using different strategies to reduce waste and ways to re-use leftovers. This unexpected result is probably associated to the fact that the convenience sample used is probably a bias, since they a great part of respondents had a previous contact with this subject via Lipor as well as the possibility of the social desirability may influence the answers.

- **15492 | Biophysical characterization of the 5000 m front crawl in open water swimming**

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Understanding the biophysical determinants of open water swimming is fundamental to enhance performance and achieve high-standard levels in competitive swimming. Scientific research in open water is taking its first steps and is still scarce, and no studies are known to carry out a biophysical analysis at official distances and environments (5, 7.5 and 10 km). The purpose of this study was to identify and characterize front crawl biophysical performance determinants in 5000 m in open environment, simulating a competitive situation. Seven swimmers, four males and three females, were evaluated in a 5 x 1000 m protocol for the assessment of bioenergetic variables, such as blood lactate concentration ([La-]) and blood glucose, of biomechanical variables, such as stroke rate (SR), velocity (v), stroke length (SI) and stroke index (SI), and also of ventilatory variables, such as oxygen uptake (VO₂ kinetics), pulmonary ventilation and respiratory coefficient. In the biomechanical variables we recorded a mean value of the velocity of 1.27 ± 0.07 m.s⁻¹, during the test, recorded also a mean value 33.8 ± 2.2 cycles.min⁻¹ for stroke rate, 2.27 ± 0.19 m.cycle⁻¹ for stroke length, 7.47 ± 0.49 m².s⁻¹.cycle⁻¹ for stroke index (SI), while in the bioenergetic variables we recorded a mean value of 2.4 ± 0.9 mmol.L⁻¹ for [La-] and 86 ± 6 mg.dL⁻¹ for blood glucose. In the ventilatory variables we recorded a mean value of the VO₂ absolute of 2.61 ± 0.61 L.min⁻¹, a mean value of 72.6 ± 19.4 L.min⁻¹ for pulmonary ventilation and, in respiratory coefficient, we recorded a mean value of 0.99 ± 0.04 , with energy expenditure and energy cost ranged around 637 ± 54 kJ and 0.6 ± 0.05 kJ.m⁻¹ with the aerobic pathway accounting for ~95.6%. The results suggest that in 5000 m open water swimming, the aerobic energy contribution plays a fundamental role in energy demand swimmers and there is also a physiological balance along with a biomechanical fit.

- 15493 | Socioeconomic determinants on body image perception in an adults' sample of Porto city

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Introduction: Body image dysfunctions are recurrent and worrisome, due to the existence of unrealistic beauty patterns, which causes body dissatisfaction and seeks unhealthy solutions to achieve these standards.

Objective: Analyze the influence of socioeconomic variables on body image perception.

Methodology: An indirect administration questionnaire was applied, between May and June of 2018, in an 87 adults' sample members of a gymnasium or beneficiaries of a Social Institution located in Porto, in whom were evaluated socioeconomic variables, practice of physical activity, attempts to weight loss/gain, special dietary regimens existence or regimens conditioned by pathology, worrying with the change of eating habits, body image satisfaction, anthropometric data and body image perception. For statistical analysis, Wilcoxon and Mann-Whitney tests were applied, as well as Spearman correlation coefficient.

Results: Generally, there was a tendency to overestimate their current body weight. Higher income ($p=0,223$; $p=0,037$), higher school level ($p=0,242$; $p=0,024$), female sex ($P50=1,00$; $p<0,001$), worrying with the change of eating habits ($P50=1,00$; $p=0,019$) and the attempts of weight loss ($P50=0,00^*$; $p=0,037$) appear to be risk factors for body image distortion.

Conclusions: For enabling knowing, the factors that promote distortion and body dissatisfaction can become a valuable tool to develop appropriate interventions for the prevention and treatment of pathologies such as eating disorders and obesity.

Keywords: Body Image, Adults, Body Image Perception, Determinants.

- **15494 | The effect of strength training on vertical jump of young football players**

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Strength training in young football players should include an appropriate perspective to the physiological maturation of the athlete, and should not be excluded from the training plan. With a good prescription and training organization, strength training only benefits the athlete.

The aim of this study was to investigate the effect of a strength training program on vertical jump in young football players, which will imply a better performance in the effective game. The athletes were submitted to two moments of evaluation (non competitive and competitive periods), in which the Counter Movement Jump with and without balance was used as measurement method.

The sample comprised 20 male with ages between 13 and 14 years, playing in the national championship under 15. It was applied a training program with a combination of traditional strength exercises, plyometric exercises and specific soccer exercises all in one exercise or station [1], for three weeks twice a week, with charges adapted to the athletes' physiological maturation. The statistical procedures using SPSS version included descriptive statistic (mean and standard deviation) and inferential statistics. Significance level was fixed on $p \leq 0,05$. The main conclusions were: i) a more fluent motor coordination plays an important role in strength development; ii) without balance results in the Counter Movement Jump had a more significant evolution than with balance results according to the Wilcoxon test; iii) the strength training used made vertical jump performance increased; iv) the amplify in strength and the upgrading of the Counter Movement Jump, induced a more complete preparation for the effective game.

Key-words: Counter Movement Jump; football; strength; young players

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- 15500 | Installations of the Higher Polytechnic Institut of Viseu: the architecture projects by CEFA/UP (1989-2010).

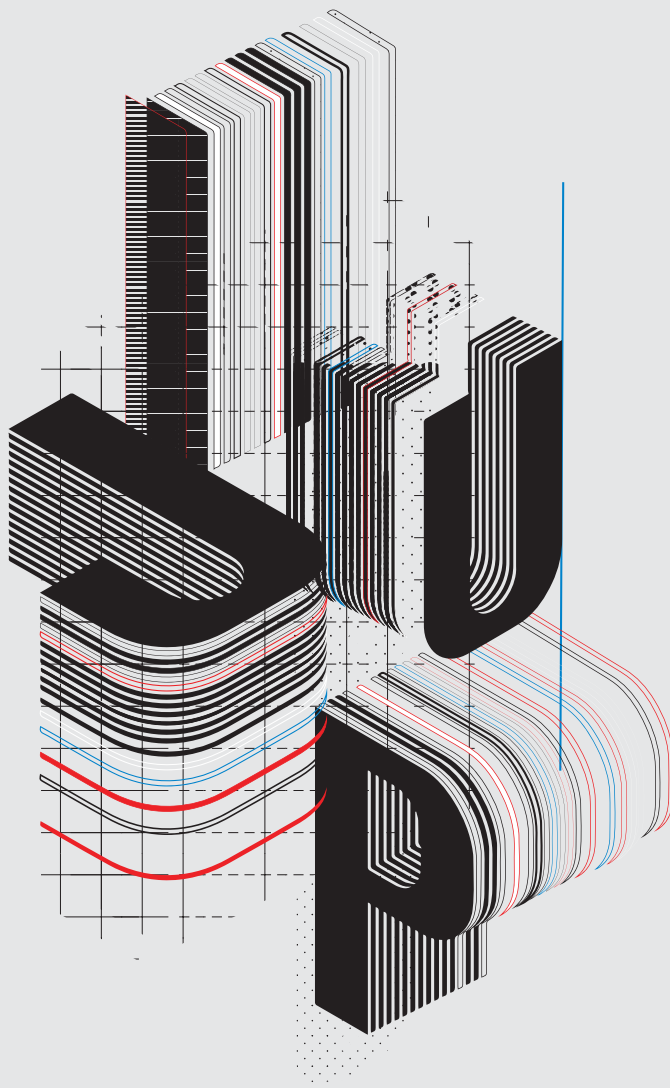
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The current facilities of the Higher Polytechnic Institute of Viseu (ISPV) are originated in portuguese Decree-Law 402, which established the creation of a Higher School in the city of Viseu in 1973. That decree comes from the national educational reform of the government of Marcelo Caetano and whose determinations are part of the *Proposal for the Establishment of the New Higher Education Institutions* (197-) of the Minister of Education José Veiga Simão. From these facts, the dissertation in development is investigating the object of the ISPV complex of buildings under the perspective of the architectural solutions according to these new resolutions, that are focused especially on *interdisciplinarity*, *multidisciplinarity* and *research*. In turn, the construction of this educational equipment comprises a set of projects designed between 1989 and 2010 by a group from the Center for Studies of the Faculty of Architecture of the Oporto University (CEFA / UP). Among several collaborators, we have that this group of architects was inaugurated through coordination of the architect Prof. Dr. Sérgio Fernandes and with the participation of the architects José Luís Gomes and Joaquim Oliveira. The CEFA / UP projects for the ISPV should be analyzed from the perspective from general context to the detailed analyzes of its solution among three main focuses: "design strategies", "materiality" and "spatiality".

POSTER SESSIONS

12.^a EDIÇÃO

U.PORTO



- **14968 | Advance Directives of the terminal patient: a research about the regulation process - comparative study between Germany, Portugal and Brazil**
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From antiquity, death instigates and frightens peoples. To justify the end of life, religious theories arose which claimed to be divine will. As a counterpoint, Science and Medicine sought sophisticated treatments to control life from conception to its final term. Faced with this, several terminal patients have their life prolonged by means of devices and medicines that are incapable of regressing the advance of their illnesses, but avoid a natural death of the patient. The basic scientific premise of this scientific research project is that all individuals have the right to a dignified life from birth to death, regardless of how it occurs. For this, the self-determination of the terminal patient should be guaranteed by contemporary legislation and accepted when the patient's will, even if expressed in advance. Throughout this project, we have explored this problem since its first discussions in the Portuguese Parliament, its impact on that society, its validity requirements, its effectiveness and, in a comparative study, we relate to the German Patientenverfügungen. After exhaustive research on the Portuguese and German systems, we have made a comparison of the patient's policy in the light of the Brazilian reality, especially after the advent of the Medical Code of Ethics ("Código de Ética Médica do Brasil").

- 14970 | The *modus operandi* of the writer or an underlying theory about the literary creation: analyzing Edgar Allan Poe's *The Philosophy of Composition*

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Edgar Allan Poe's intricate theory about the process of literary creation is noted for two essential points: firstly, a literary work of art must create a unity of effect on the reader -the single preconceived effect -, to be considered successful; secondly, the production of this single effect should not be left to the hazards of accident or inspiration, but should the minutest detail of style and subject be the result of rational deliberation on the part of the writer, what emphasizes the symbiosis of the poetic creation with the creator's mental faculties as opposed to the romantic aesthetic that faced it as a purely intuitive phenomenon (Silva: 1967). In poetry, the single preconceived effect must arouse the reader's sense of beauty, since it constitutes "the province of the poem" (Poe 2016: 38), an ideal that the author associated with melancholy, strangeness and loss; in prose, this effect should be one revelatory of some truth, as in works evoking terror, passion or horror. Thus, having as a starting point *The Philosophy of Composition* (1846), we illustrated the *modus operandi* of the writer, that is, a methodical way of operating on the literary creation which Poe describes "with the precision and rigid sequence of a mathematical problem" (ibidem: 36), using as example the multiple steps involved on the elaboration of his poem "The Raven". In order to explicit the underlying theory about the process of artistic creation on Poe's aforementioned essay we also studied the following elements: extent, method and the unity of effect, and casted distinct perspectives that emerged over time in this field of literary studies.

Keywords: literary studies; literary creation; theory of literature; Edgar Allan Poe; *The Philosophy of Composition*

- **14984 | HOXB genes function in Breast Cancer**

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HOX genes encode transcription factors crucial for embryonic development, affecting cell proliferation, apoptosis, differentiation, motility and signalling. Therefore, it is not surprising an involvement of HOX proteins in an oncological context, where these cellular processes are severely affected. Indeed, altered expression of several HOX genes has been documented in cancer cells. However, it remains unknown the impact of these HOX deregulation in the molecular networks behind cancer progression.

Breast cancer (BrCa) is the most common type of cancer and the second cause of cancer-related death in women. Here, a total of 27 HOX genes were found to be deregulated and most have a tendency for overexpression, such as genes from the HOXB cluster. The aim of this project is to investigate the impact of HOXB genes altered expression in the molecular networks involved in BrCa progression. The deregulation of HOXB genes has been proposed to impact the progression of BrCa in two distinct ways: a) they may modify the transcriptome of the cells, leading directly to the activation or repression of oncogenes or tumour suppressors; b) they may interfere in the expression of methyltransferases, which then epigenetically control the expression of oncogenes or tumour suppressors genes. In this project we explore these hypotheses performing functional assays in multiple BrCa cells and normal cells and characterize the behavioural effects in vitro and in putative downstream targets, namely methyltransferases, oncogenes and tumour suppressor genes. Moreover, we have also been characterizing HOXB genes associated molecular networks in a BrCa biopsies cohort.

- **14998 | Burnout and engagement among nurses of North Portugal**

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Introduction/aims: Nurses are currently a vulnerable group to experience burnout (Monsalve-Reyes et al., 2018), which affects both their physical and psychological health as well as the quality of care they provide (Iro, 2018; Liu et al., 2018). However, when nurses are motivated and involved with their job, work engagement is a protective factor of job stress (Bogaert et al., 2017). We aim to identify burnout 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 346 Portuguese nurses the Maslach Burnout Inventory (Maslach et al., 1996) 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: Moderate values of emotional exhaustion and low levels of depersonalization were found, with 54% of nurses showing a low level of burnout, 36% moderate and 9% high burnout. Engagement values are high, and burnout decreases with age and job experience, being related with rotating shifts, and showing negative correlation with engagement. The existence of 9% of nurses in burnout confirms this group as being at risk of becoming psychologically ill (Fuente et al., 2015).

Conclusions: Recently Eurofund (2018) suggested that burnout must be study in Europe, while Bakker and Oerlemans (2016) referred that workers with high levels of engagement, as opposed to those with high burnout, are able to better cope with job stressors. Thus, occupational health services must reinforce the prevention of burnout through emotional intelligence and engagement (Saito et al., 2018), contributing for nurses' health and for the safety of patients treated with better care quality (Liu et al., 2018).

Keywords: Burnout; Engagement; Correlational Study; Nurses.

- **15004 | Potential of salt marsh plants for removal of pharmaceutical compounds from estuarine environment**

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In the last decades, as a consequence of air, water and soil degradation, environmental problems have become more and more an issue. Pharmaceutical compounds are environmental pollutants, considered to be emerging pollutants, are being studied to understand their potential impact on the environment, human health and even on water settings. In fact, sometimes these compounds are not completely eliminated in water treatment stations, which lead to their discharge in the environment. The environmental impacts of these pollutants have already been reported. Thus, new methodologies for the elimination of those compounds from the environment are needed. In this scenario, phytoremediation may be seen as an option.

In this work, the potential of salt marsh plants for the removal of two pharmaceutical compounds, namely an anti-lipid, bezafibrate, and an antidepressant, paroxetine, from estuarine environments, has been evaluated. For that, a 7-day-long experiment, in which were subjected to a simplified estuarine medium, elutriate solution with or without estuarine sediment and without or with addition of nutrients, was carried out.

Selected salt marsh plants, alone or together with the sediment, showed to play a role in the degradation/ removal of both pharmaceutical compounds. In the presence of a removal percentage of 65% for paroxetine was observed, whereas microorganisms present in the sediment lead to a removal of 85%. For bezafibrate, removals were slightly lower, attaining 34% in the presence of and 59 % due to microbial degradation.

Present results indicate that phytoremediation could be a viable option for eliminating/diminishing the environmental impact of pharmaceutical compounds.

- 15010 | Chemical characterization and bioactivity analysis of *Xylopia aethiopica* (Dunal) A. Rich fruits

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The use of plants is as old as mankind itself: since ancient times man has used chemical substances of vegetable, animal and microbiological origin to prevent, cure and treat diseases. With pharmaceutical industrialization, and consequent therapeutic evolution, there was a decrease in the use of plant extracts as a source of new pharmaceutical discoveries. However, the belief of most researchers in plants and other natural products as sources of a huge diversity of bioactive compounds has meant that natural products continue to play a key role in the discovery of new drugs, 90% of the medicines on the market being produced through them. The challenge nowadays is to discover, study and know plants with promising activity and to isolate their active principles.

The purpose of this work was to improve the knowledge on the chemical and biological properties of a hydroethanolic extract prepared from *Xylophia aethiopica* (Dunal) A. Rich fruits.

HPLC-DAD analysis allowed the detection of carotenoids, pheophytin *a* and phenolic compounds.

By GC-FID analysis were identified 19 fatty acids. The assay against DPPH radical showed $41.81 \pm 4.82\%$ scavenging for the highest concentration tested (86.54 mg/mL). Regarding NO radical, $8.4 \pm 1.8\%$ was scavenged with the highest concentration that could be tested (0.998 mg/mL).

The phytochemicals found in this species and the results from the bioactivity assays point to the possible interest in the consumption of *X. aethiopica* fruits, which may provide benefits to human health. Other extracts could help clarify the potential of this material.

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.

- **15011 | *Ulva lactuca* (Sea lettuce): chemical characterization and biological analysis**

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Although matrices from the aquatic environment are less explored, they have a high potential to contribute to science and the discovery of new molecules. Algae are a particular example, comprising a diverse group of eukaryotic microorganisms that can be found all over the planet, exhibiting various therapeutic applications, such as anti-oxidant, anti-inflammatory and anti-bacterial activity.

Ulva lactuca L., a green alga with ubiquitous distribution, is widely spread throughout the Atlantic Ocean. The chemical composition of its ethanolic extract was evaluated by HPLC-DAD and GC-FID analyses, as well as its antioxidant potential against DPPH and NO radicals.

HPLC-DAD analysis showed the presence of pheophytin *a*, a degradation product of chlorophyll *a*, and some of its derivatives. No phenolic compound was found. In addition, 12 fatty acids were identified, C16:0 appearing to be the most abundant one.

In what concerns to the antioxidant potential, almost no capacity to scavenge DPPH radical was observed ($3.6\% \pm 1.4$ at 77.96 mg/mL). On the other hand, a concentration-dependent activity was observed for NO radical, with an inhibition of $16.88\% \pm 3.43$ for the highest tested concentration (259.86 mg/mL).

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.

- **15012 | Valorization of a Guinea Bissau's natural matrix: *Xylopia aethiopica* leaves**

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Medicinal plants are an integral part of the African healthcare system since immemorial times. It has become evident that plants have medicinal properties and those used in African traditional medicine might offer potential candidates for the novel drug discovery process. In this context, it is important the exploration and validation of those species considering traditional use, phytochemicals, and *in vitro*, *in vivo*, and clinical studies. *Xylopia aethiopica* (Dunal) A. Rich. is an evergreen tree, widely distributed in West, Central and Southern Africa. This study aimed to provide information about the chemical composition and antioxidant activity of an ethanol extract prepared with the leaf of *X. aethiopica*. The extract was analyzed by HPLC-DAD and GC-FID, for identification of phytochemicals, and its antioxidant capacity was evaluated by DPPH and nitric oxide (NO) radicals scavenging assays. The GC-FID analysis allowed the identification of 17 fatty acids and indicated palmitic acid as the main one. The HPLC-DAD analysis revealed the presence of carotenoids, chlorophylls and phenolic compounds, being lutein, chlorophylls a and b and kaempferol-3-O-rutinoside the most abundant from each class. The extract demonstrated concentration-dependent antioxidant activity against the two radicals, IC₅₀ value of 22.49 mg/mL and IC₂₅ value of 14.06 mg/mL being obtained for DPPH and NO, respectively. The results showed that this species is medicinally promising.

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.

- **15013 | From the oceans to the lab: Bioactivity and chemical characterization of *Pelvetia canaliculata***

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Covering more than 70% of the earth's surface, oceans represent the largest habitat of the planet, but also the least explored one. It was concluded that at least 50% and potentially more than 90% of all marine species remain scientifically undescribed. The ones that are already reported are not always studied, although they could potentially constitute a novel and rich source of bioactive compounds. [1]

In order to expand the current knowledge on this topic, the present work aimed the study of the chemical composition and antioxidant activity of an ethanol extract of the brown macroalgae *Pelvetia canaliculata* (Linnaeus) Decaisne & Thuret.

GC-FID analysis allowed the identification of a variety of fatty acids, of which oleic acid was unequivocally the most abundant. HPLC-DAD analysis revealed the presence of fucoxanthin, as expected, pheophytin a, some of its derivatives and also three derivatives of chlorophyll c. For the determination of the antioxidant activity, the ability to scavenge 1,1-diphenyl-2-picrylhydrazyl (DPPHo) and nitric oxide (oNO) radicals was evaluated. The extract scavenged DPPHo in a concentration-dependent manner (IC₂₅ = 40.03 mg/mL). Regarding oNO, the results suggest a protective effect dependent on the concentration.

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.

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- **15021 | Pedagogic Innovation in Higher Education in Times of Transposition in the Knowledge Society - Analysis of the Program "Pedagogical Excellence Award" of the University of Porto.**

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This research project is developed for presentation in June / 2019 to the Faculty of Psychology and Educational Sciences of the University of Porto to obtain a Master's degree in Educational Sciences under the scientific guidance of Prof. Dr. Elisabete Maria Soares Ferreira.

The central problem of research is the implementation of pedagogical innovation in Higher Education. The object of studies will be the "Pedagogical Excellence Awards" of the University of Porto.

The objectives and expected results are:

- Reflection on some concepts of teaching-learning and pedagogical innovation in Higher Education.
- Identify and systematize the main practices and competencies attributed to the teachers highlighted in the Pedagogical Excellence Awards of the University of Porto in the year 2015.
- Identify and analyze the main implications and collateralities in the implementation of pedagogical innovation in Higher Education, as well as proposals for overcoming.

Research Methodology:

- Semi-structured interviews (Teachers awarded in 2015 / Pro-rector of the Pedagogical Innovation)
- Focus Group (Students of the award-winning faculty)
- Document Analysis.

Place of the investigation: Rectory of the University of Porto.

PEDAGOGICAL EXCELLENCE AWARDS

The "Pedagogical Excellence Awards" were created to distinguish, promote and disseminate educational models of excellence that meet today's pedagogical challenges.

In this perspective, the application of coordinated processes of teaching, learning and evaluation as well as active learning by the student is valued. It also recognizes the integration of the scientific development component and the use of educational technologies.

Aimed at teachers, researchers or groups of teachers who are constituted as a teaching team in the teaching of one or more curricular units.

- **15033 | THROUGH THE RECORDS OF JELLYFISH BLOOMS IN PORTUGAL**

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Blooms are a rapid increase in the population size of some key species in a certain ecosystem. They can occur as a natural result of the water-based environments but it is known that exists some drivers of their occurrence such as global warming, overfishing, eutrophication, and widening of invasive species habitats. Among the records of blooms occurring worldwide, the most dangerous have been those reported for jellyfishes as the ones produced by the Portuguese Man o'War *Physalia physalis*, a species commonly found in the Portuguese coast. These blooms provoke negative impacts on human activities such as fisheries, public health, tourism, the normal functioning of factories and aquaculture. In Portugal, the studies of such blooms are still scarce, thus their impacts are underestimated. The main goal of this work is to establish the state of the art of the blooms reported for jellyfishes in Portugal. For this purpose, we reviewed the scientific literature and the records in magazines. We conclude that jellyfish blooms may occur systematically in Portugal since some occurrences have been reported in Guadiana, Mondego, and Mira estuaries in recent years. We also found a project entitled "GelAVista" that applies a citizen science approach to follow the occurrences of some species like *Catostylus tagi*, *Rhizostoma luteum*, *Velella velella* and *Physalia physalis* through the country. Nonetheless, such information is scarce and must be updated and extended to more citizen scientists participating on it. Moreover, these species represent a threat for people and economy in the near future because of the climate change correlates with their records. Therefore, we suggest that the development of a consistent monitoring net and early predictive tools based on oceanographic parameters and molecular biology (*i.e.*, Next Generation Sequencing) would be a good approach to deal with the possible rise of jellyfish blooms.

- **15037 | Refractory Bladder Pain Syndrome/Interstitial Cystitis treatment with Onabotulinum toxin A injection: the role of functional MRI**

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Introduction

Bladder Pain Syndrome/Interstitial Cystitis (BPS/IC) is a chronic condition characterized by suprapubic pain, pressure or discomfort, along with other lower urinary tract symptoms, such as urinary frequency, urgency or nocturia, without any identifiable infection.

The pathophysiology of BPS/IC remains incompletely understood, but some authors support a key role of central sensitization, an amplification of neural signalling within the central nervous system that elicits pain hypersensitivity.

Onabotulinum toxin A (OnaBotA) is an effective treatment of BPS/IC that impairs sensory activity in nociceptive bladder afferents, inhibiting the nociceptive input through the spinal cord, therefore improving pain.

Advanced neuroimaging techniques allowed the study of pain pathways, including the brain response to noxious stimuli. The aim of our study was to identify differences in brain activity before and after OnaBotA treatment, comparing functional MRI images of patients with BPS/IC submitted to trigonal injection of OnaBotA.

Methods

We selected four patients with BPS/IC and indication for treatment with OnaBotA, that were evaluated by physical examination, pain intensity scored by 10-point visual analog scale (VAS), 3-day voiding chart, Charlson Comorbidity index (CCI), O'Leary-Sant score (OSS) to evaluate symptoms and problems and Quality of life (QoL). Before OnaBotA injection, patients underwent high-resolution MRI, and then repeated 4 weeks after treatment.

Discussion/ Conclusion

We expect to obtain differences in brain activity detected by functional neuroimaging, suggesting that OnaBotA has beneficial effects by improving pain at different bladder capacities. The inhibition of the nociceptive input seems to play a key role in BPS/IC etiopathology.

- **15041 | Development of Specialized Virtual Screening Protocols for Inhibition of Quorum Sensing**

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The increased antimicrobial resistance and mutation rate of bacteria in biofilms greatly contributes to the development of antibiotic resistance, a critical problem in our society that tends to increase to alarming levels. Preventing biofilm formation could dramatically reduce the effects of infectious diseases [1, 2]. One way to achieve this is by interfering with the mechanisms of quorum-sensing (QS), which is the cell-to-cell communication in bacteria. QS is critical to the formation of organized structural communities of bacteria in biofilms [3]. Several different microbial-derived signaling molecule types and receptors have been recently characterized by X-ray crystallography, offering a very appealing opportunity for rational design of new drugs.

Protein-ligand docking [4] is a methodology that uses computers to predict the pose and affinity of specific molecules to particular receptors or enzymes. When used in a context of virtual screening [4], docking can be used to evaluate the possibility of millions of compounds in binding to a particular protein target, limiting the amount of molecules that have to be tested experimentally, while ensuring a greater exploration of the chemical space.

This work reports the specific optimization of a virtual screening methodology and scoring function for increased active/decoy discrimination for different synthases and receptors involved in quorum sensing. The optimized protocol can now be used to evaluate extensive databases of new compounds including natural products, marine compounds and commercial molecules, as to identify novel scaffolds for drug development with anti-biofilm potential.

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- **15047 | Biocompatibility and skin hydration potential of vitamin E-loaded lipid nanosystems formulations**

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The demand for effective cosmetics with pleasant sensory characteristics that promote hydration has led the cosmetic industry to develop new formulations. Thereby, regarding their advantages over other nanosystems, the use of formulations based on lipid nanosystems, such as nanostructured lipid carriers (NLC) and nanoemulsions has been highlighted. Nonetheless, the skin application of lipid nanoparticles and nanoemulsions dispersions is difficult, being suggested their use by means of semi-solid formulations. In this study, we performed comparative investigations between two hydrogel formulations containing vitamin E-loaded NLC (HG-NLCVE) and vitamin E-loaded nanoemulsion (HG-NEVE). The experiments started with particle size measurements, which showed no significant differences between nanoparticles/nanodroplets size after incorporation in the hydrogel net. Subsequently, *in vitro* biocompatibility studies in human keratinocytes were carried out, being observed that both tested lipid-based nanosystems were more cytotoxic for the cells before incorporation in the hydrogels. Finally, the hydration potential and sensory attributes for skin application of the developed formulations were evaluated by *in vitro* occlusion tests and *in vivo* human experiments. The results showed that the HG-NLCVE has the best occlusive properties, whereas the HG-NEVE exerts a faster skin hydration. Furthermore, the latter was selected as the most attractive for skin application, although the HG-NLCVE is more suitable to obtain a long-lasting effect. This study demonstrated the *in vitro* and *in vivo* safety and hydration potential of hydrogels containing vitamin E-loaded in lipid-based nanosystems. These results establish a basis to assess the cutaneous use of these systems, despite more *in vivo* experiments, for longer periods and in more volunteers, are required before commercialization.

- **15048 | Immunological Changes with Bronchial Thermoplasty in Asthma**

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Asthma is a complex heterogeneous disease, characterized by bronchial hyperreactivity and recurrent airflow obstruction. It contributes with disease burden to 300 million subjects worldwide, with only 3-4% of these exhibiting persistent incapacitating symptoms- Severe Refractory Asthma (SRA). Bronchial Thermoplasty (BT) is an innovative technique approved for the treatment of SRA, through the ablation of bronchial smooth muscle (BSM). It has been proved to be associated with favourable clinic outcomes, such as decrease in the number of doctor's appointments and improvement in pulmonar function and quality of life scores. Nevertheless, the fisiopathological mechanism altered by the technique remains unclear. With this in mind, we performed a systematic review in order to assess the immunological and inflammatory effects of BT on asthmatic subjects.

Three database were consulted- Medline, Scopus and ISI Web of Science. Only english author or revision articles were included, namely the ones that exposed immunological, inflammatory or structural alterations. Studies concerning efficacy or technique's safety were excluded as well as guidelines, proceeding papers and meeting abstracts. Nine articles were included and revised by 3 individuals independently.

Studies suggested a reduction in BSM mass and area and an increase in bronchial epithelium's integrity. Numerous cellular changes were demonstrated, for instance, lower counts of eosinophils and mastocytes and higher counts of macrophages and regulatory T cells were found. Cytokine-related assessment demonstrated an increase in TRAIL expression, a decrease in TGF- β and RANTES/CCL5 quantification and no further change in other possibly relevant asthma-related cytokines.

BT presents itself as efficient controlling severe asthmatics' symptoms. However, further investigation is required concerning IgE quantification in bronchoalveolar lavage as well as long-term effects evaluation.

- **15051 | Evaluation of Bioactivities by Flow Cytometry**

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The discovery of antibiotics led to a revolution in health care, drastically reducing mortality rates worldwide. The recent rise in antibiotic resistance by pathogenic bacteria reinforces the need for the discovery of new leads.

Bacteria from marine environments can produce bioactive compounds that have the potential to be used as novel drugs. Members of the phylum *Planctomycetes* can be found in several marine samples and are known for their unique morphological and genetic characteristics. Furthermore, they are known to produce bioactive compounds of yet uncharacterized composition.

In this study, an antimicrobial screening protocol was designed to integrate flow cytometry, a technique that allows for precise measurements of millions of individual cells, and enables the assessment of cell viability after drug exposure. For that, growth curves of target microorganisms were determined based on colony forming units and absorbance. With this data, cultures in the exponential phase were treated with serially diluted commercially available antimicrobials. To assess cell viability or death, the fluorochromes fluorescein diacetate and propidium iodide were used. Results from experiments where planctomycetes extracts assessed by flow cytometry, regarding their capacity to affect viability, will be discussed.

- **15053 | Evaluating the effects of tryptophan on brain serotonin levels, acetylcholinesterase activity and behavior of Zebrafish (*Danio rerio*)**

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Tryptophan (Trp) is an essential amino acid crucial for protein accretion aside various metabolic functions. In addition, it is also the precursor of the neurotransmitter serotonin, which was shown to have relevant roles in physiological and behavioral responses. Supplementation of Trp in diets, as Trp can act as a functional amino acid, has been reported to enhance serotogenic activity, which may be important in stress mitigation.

Deficiency in Trp can cause lordosis, cataracts, lethargy in fish and reduce drastically serotonin levels in the brain. In opposite, higher levels of Trp may increase serotonin release and synthesis of melatonin, which might reduce voluntary feed intake, and excessive levels of Trp may impair growth, which can be interpreted as a sign of toxicity. Moreover, serotonin has been shown to inhibit acetylcholinesterase (AChE) activity in rats.

Thus, this study aims to evaluate effects of dietary deficiency and supplementation of tryptophan in zebrafish by measuring brain serotonin levels, and AChE activity in brain and muscle. Locomotor behaviour will also be assessed as it can be affected by AChE inhibition.

For this purpose, a growth trial is being performed with zebrafish fed isoproteic (40% DM) and isolipidic (8%DM) diets supplemented with five different levels of Trp ranging from 0.00 to 3.00% DM, for a total dietary Trp levels of 0.19, 0.38, 0.76, 1.52 and 3.04% DM. Diets are being tested in quadruplicate, fish are fed twice a day, six days a week for a 6-8 week period. At the end of the trial, brain and muscle will be collected for AChE activity and the assessment of brain serotonin levels, and locomotor behavior will be measured with a video-tracking system.

- **15054 | Evaluation of mifepristone induced preterm birth on neonatal milestones, behavior, cognition and hippocampal morphology**

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Aim: Characterize the mifepristone (RU486) non inflammatory model of preterm rat, assessing the neurologic outcome in the neonatal period and adulthood through behavioral tests and evaluating neurogenesis, the cholinergic system and the expression of the neuropeptide Y (NPY). **Methods:** In order to induce preterm birth, pregnant Wistar rats received a mifepristone (RU486) injection on embryonic day (ED) 20. The pups born about 24 hours later and were then tested through neonatal developmental milestones. After weaning, animals were submitted to the following behavioral tests: Morris water maze, elevated plus-maze and open-field. One month after weaning, rats were deeply anesthetized, perfused and processed for immunohistochemistry for doublecortin (DCX), Vesicular acetylcholine transporter (VAcHT) and NPY. Areal densities of neurons were estimated by counting the number of cells within a given area of the hippocampus. The VAcHT cholinergic varicosities stained were counted using a computer-assisted image analyzer.

Results: Rat pups from ED21 group did not reveal significant alterations in the neonatal developmental milestones and, after weaning, they did not significantly differ from controls in the open-field, plus-maze and Morris water maze. There were also no significant differences in the density of DCX-immunoreactive cells, NPY-immunoreactive neurons or VAcHT varicosities.

Conclusion: There were no significative changes on the neonatal milestone. After weaning, there were also no significant alterations in the anxiety levels and in the spatial learning and memory, nor changes in the neurogenesis, NPY and cholinergic expression. The present model was unable to recapitulate the characteristic alterations of preterm birth and, at least in rat, the development seems to be normal without an external noxious stimulus.

- **15057 | Detailed geological mapping of the Paleozoic around Valério Quarry (Centre of Geological Interpretation of Canelas-Arouca, Arouca Geopark), Canelas, Northern Portugal**

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This study focuses on the geological outcrops of the area adjacent to the Valério Quarry (Canelas, Arouca), which is part of the inverse limb of the Valongo Anticline and is located in the Central-Iberian Zone of the Iberian Massif. Its main objective was to elaborate a detailed geological map, covering an area of 1200m by 900m at a scale of 1: 4300, while identifying outcrops, structures, mineralizations and fossils. The Palaeozoic succession from Cambrian to Carboniferous was analysed, with the exception of the Devonian which does not outcrop in this area. Regarding stratigraphy, volcanic layers outcrop in the Cambrian and Lower Ordovician. At the top of the Valongo Formation (Middle Ordovician) near the contact to the Sobrido Formation (Upper Ordovician) were observed numerous nodules and a ferruginous layer. In the base of the this Formation, massive quartzites outcrop underlying diamictites. In the Silurian, light grey laminated slates bearing graptolites were found. In the Carboniferous, breccias, conglomerates, sandstones and black slates were observed. Regarding paleontology, in addition to the animal fossils already identified in the Middle Ordovician slates, namely trilobites (some of the largest in the world) graptolites, cephalopods, brachiopods, gastropods, echinoderms, bivalves, cystoids and crinoids; the ichnofossils Cruziana and Planolites were identified in the quartzites of the Lower Ordovician. In the Carboniferous slates were found vegetable fossils. Regarding the mineral resources beyond the slates of Middle Ordovician extracted in the quarry, there is an ancient Roman gold mine on quartzites with intercalations of schists and volcanics of the Lower Ordovician, the Gralheira d'Água mine (type Au-As mineralizations). In the course of this study, antimony mineralizations (Sb-Au type mineralizations) associated to the volcanic layers of the Cambrian-Ordovician transition, were studied by SEM.

- **15060 | Biostratigraphy of the Valongo Formation (Middle Ordovician) in Belói area (Northern Portugal)**

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Belói is located next to São Pedro da Cova, in the municipality of Gondomar, NW of Portugal. Geologically, the studied area is inserted in the inverse limb of the Valongo Anticline, a NNW-SEE trending Variscan fold. The Anticline is formed mainly by metasediments of marine facies ranging from the Cambrian to the Devonian cut by Variscan granites. Several authors developed studies in the Middle Ordovician of the Iberian Peninsula, in order to understand the division of existing biozones and of their main features. The first one was Delgado (1908) who mapped Ordovician strata in association with the fossils they contain, establishing biostratigraphic divisions. So according this author Valongo Formation (Middle Ordovician) is formed, from base to top, by the "Slates with *Didymograptus* ", " Slates with *Orthis noctilio*" and " Slates with *Uralichas ribeiroi*" distinguished mainly by paleontological criteria. More recently a biostratigraphic succession of the Middle Ordovician was proposed using as dating criteria graptolites and microfossils related with different trilobite associations in the same stratigraphic horizons. Geological mapping allowed recognizing the limits of Valongo Formation. The objective of present study was to identify biozones based on different species of *Placoparia*. In Valongo Formation four different biozones can be distinguished, namely from older to younger, the *Placoparia cambriensis*, the *Placoparia nava*, the *Placoparia borni* and the *Placoparia tournemini* biozones. Samples were collected in the upper part of the Valongo Formation ("Slates with *Uralichas ribeiroi*"), dominantly formed by slates and some siltstones, where the fossils are diversified and abundant. A fauna with cephalopods, crinoids dominated by trilobites was recognized. Among trilobites, *Placoparia*, *Ectillaenus*, *Neseuretus*, *Eodalmantina*, *Nobiliasaphus*, *Dionide*, *Prionocheilus*, *Salterocoryphe* were found. The dominance of *Placoparia tournemini* allowed identifying this biozone

- **15065 | Widespread of ampicillin-multidrug-resistant *Enterococcus faecium* in raw chicken meat, Portugal**

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Ampicillin resistance-AmpR often occurs in *Enterococcus faecium*-Efm from hospitalized-humans (clade-A1) and less in community isolates (clade-A2: human/animal; clade-B:human-commensal). AmpR plus specific virulence factors were proposed as molecular markers of Efm linked to human infections, which can have an impact in Efm strains risk assessment in different public health contexts (PMID:29519512). We studied the occurrence of AmpR-Efm with potential public health impact in raw chicken-meat samples.

Samples (n=53; neck skin of 10 carcasses; 29 producers) obtained at processing level were pre-enriched (Buffered-Peptone-Water; 37°C/16-18h), enriched (BHI-broth+Amp-16µg/mL) and plated [Slanetz-Bartley-(SB) and SB+Amp-16mg/L]. Susceptibility was studied for 11 antibiotics (disk-diffusion; EUCAST/CLSI). Identification (ddl), virulence (esp/sgrA/ecbA/complete-acm/hyl/ptsD/orf1481/IS16), copper-tolerance (tcrB/cueO) and linezolid resistance (optrA/poxA; DNA extracted from the pre-enrichment) genes (PCR) and clonality (Smal-PFGE/MLST) were studied.

AmpR-Efm (49 isolates) occurred in 83% of samples. They were co-resistant to tetracycline, erythromycin-both 100%, quinupristin-dalfopristin-94%, ciprofloxacin-73%, streptomycin-31%, gentamicin-12% or chloramphenicol-2%. Ten clones were identified (PFGE), some persisting for long periods and from diverse producers (PFGE-A:7-isolates/6-producers/5-months; C:10-isolates/10-producers/5-months; B:2-isolates/2-producers/2-months; G:3-isolates/3-producers/2-months). The most widespread A (ST462) and C (ST1091) belonged to clade-A2. The ptsD occurred in clone G and acm in C/G/I/J. The tcrB, cueO, optrA, poxA were negative.

A high rate of AmpR-Efm was detected in chicken-meat-samples, suggesting a selective pressure by beta-lactams in the poultry production. The evaluation of the pathogenic potential of AmpR-Efm widespread clones is required, as they do not carry virulence genes combinations often linked to human infection's strains.

- **15066 | First results of trampling effects on mussel attributes and its associated fauna**

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Mussels are model organisms for physiological, biochemical and genetic research[1]. They have also an important commercial interest such as food. Moreover, they can improve water quality by removing particulates and excess of nitrogen from the aquatic environment[2]. Furthermore, they can filter toxins and microorganisms from the environment, and are considered ecosystem engineers, because they promote the establishment and the persistence of many species[2].

On Portuguese shores, the most abundant mussel species is *Mytilus galloprovincialis* Lamark, 1819, that is submitted to different anthropogenic stressors which could have negative ecological and human welfare consequences. The aim of this study was to explore the effects of trampling on the attributes of *M. galloprovincialis* and its associated fauna.

For this, 2 rocky shores in North Portugal, Moledo and Âncora, were selected. On each shore were marked 4 plots. These plots were submitted to 2 different intensities of trampling: high and control (without trampling). These treatments were repeated twice a month for 6 months. After this period, samples of mussels from each plot were collected. As mussel attributes were considered the condition index, size and density. Macrofauna associated with each plot was identified at the level of species and the sediment retained at each plot was also quantified. All these variables were analysed by means of univariate and multivariate techniques to test significant differences between treatments.

Acknowledgement

This research was developed under Project No. 30181, co-financed by COMPETE 2020, Portugal 2020 and the European Union through the ERDF, and by FCT through national funds.

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- **15072 | The Hospital's Public Private Partnerships evolution in Portugal**

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Keywords: Health management, Public Private Partnerships, Portuguese Health System

Introduction: Public-Private Partnerships (PPPs) are models that apply the private management principles to public facilities. There are three possible PPP's models: infrastructure, discrete clinical services and integrated. Portugal had an innovative approach in Europe and applied the integrated model since the beginning. In this kind of model, the private part of the partnership is responsible by hospital's construction and the clinical services management.

Objective: To analyze if PPPs are productive and cost effective.

Methods: We analyzed the PPPs productivity and economic indicators given by ACSS (Administração Central do Sistema de Saúde, IP), by comparing the development of those indicators since 2015 to 2017. The hospitals analyzed were Vila Franca de Xira, Loures, Cascais and Braga and we used the index values created by ACSS to compare the time evolutions and the quality of the hospitals between them.

Results: PPPs revealed good productivity outcomes, being the indicator with most improvement potential the average waiting time for surgery. Costs with operations and human resources showed good results, but we detected a necessity of improving the medicine's and clinical material's costs in the economical analysis.

Discussion/Conclusion: PPPs management model has all the conditions to growth and we recommend the introduction of this model in more hospitals, even though it's necessary a better monitorization, once our research faced the difficulty of missing data about the indicators analyzed.

- **15074 | The Sports Management in Physical Education: a mapping of training and research in the capital of Amazonas**

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Physical education in Brazil has been growing, due to the social and economic development of the country, bringing the need to improve the qualification of professionals to work in the sporting context. Manaus, the capital of the Amazonas, although considered incipient in terms of sport, has undergone major transformations in this area, since it started to be triggered for major sporting events, awakening to the sport and understanding the importance of management sport. Faced with the exponents of Physical Education, the need for competent managers and the firmament of the city as a great Brazilian metropolis, this dissertation sought to understand the training of sports managers in the undergraduate courses in Physical Education in Manaus, to contribute with empirical data to the understanding of this antagonistic panorama. Based on the qualitative approach, documentary sources - curricular structures, trainees reports and completion work relationships - were appreciated - from ten graduate courses in Physical Education on Public and Private Higher Education Institutions of Manaus. The documents analysis showed that sports management- an area of knowledge and intervention of the Physical Education professionals- presents a rapid expansion in the curriculum of higher education in Manaus and follow the recommendations of world's school reference in sports management. The academic's researches are scarce and no proportionally related to the number of subjects in the area that each course provides. The disciplines related to sports entrepreneurship and legal aspects of sport were more frequently in the curricular programs investigated. It was also verified that the increase of curricular subjects observed, is related to the growth of the professional market for managers of the sport in the capital. It contributes with the mapping area in the higher education, that can be a base to curricular revisions of the courses of formation in Physical Education.

- **15078 | From pre-test to preliminary results: the construction of a new tool for quality assessment of genetic counselling by patients**

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Background: Appropriate genetic counselling is essential when a genetic test is offered. Given the scarcity of effective tools, assessing the quality of genetic counselling still a challenge. In Portugal, genetic services have claimed for new quality indicators and tools. Therefore, a pioneer Portuguese instrument for quality assessment by professionals was developed. Currently, an analogous tool for patients is under psychometric validation. We report here preliminary results of this process.

Method: The first version of the scale was submitted to pre-test validation with 7 consultands at CGPP, between June and August of 2018. Cognitive interviews with 5 of those participants were performed to explore in-depth the adequacy of items', instructions and scale options. After approval of FPCEUP Ethics Committee, all main national genetic services were invited to collaborate in the validation process.

Results: After pre-test, minor modifications were performed mainly in items' wording. The present version of the scale has 52 items organized in five dimensions: (1) genetic education; (2) patients' issues; (3) relationship issues; (4) potential effects; and (5) services provision. Preliminary analysis of the scale dimensions with a cohort of 29 responses indicate a quite satisfactory internal consistency ($D1\alpha = .78$; $D2\alpha = .83$; $D3\alpha = .80$; $D4\alpha = .93$), with the exception of dimension 5 ($\alpha = .61$). A response pattern in answers distribution suggests that the majority of the sample (>50%) tend to choose the higher answer options – 4 or 5 points.

Conclusions: The process of psychometric validation will finish next May. Until there, more services are expected to be involved. At the end, we expect to produce a scale with good psychometric proprieties and practical applicability. Combined with the professionals' scale it will enable a more comprehensive understanding of genetic counselling process and improvement of practice.

- 15080 | Exploring the neuroprotective potential of *Turnera diffusa* Willd. ex Schult. (Passifloraceae): *in vitro* antioxidant, antiglycation and anti-inflammatory effects

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Turnera diffusa Willd. ex Schult. is used in traditional medicine in Central and South America, for its nootropic effects as tonic and stimulant [1]. It was demonstrated *in vitro* that *T. diffusa* aqueous extract inhibits CNS enzymes, namely cholinesterases and monoamino-oxidase A [2]. This work aims to further explore *in vitro* neuroprotective cooperative-effects of *T. diffusa* aqueous extract exerted by antioxidant, antiglycation and anti-inflammatory mechanisms. Also, to attempt a relation between its phenolic profile and the biological activities. From the thirty-seven flavonoids identified by HPLC-DAD-ESI/MSⁿ, twenty-six are reported for the first time in this species, luteolin derivatives being the dominant compounds. The antioxidant effects of *T. diffusa* flavonoid-rich extract are demonstrated by the direct inhibition of xanthine oxidase, by scavenging DPPH[•] radical and by preventing lipid peroxidation. The extract also inhibits the deoxygenation of linoleic acid catalyzed by lipoxygenase, in a concentration-dependent effect, thus supporting its anti-inflammatory potential. Furthermore, it efficiently reduces the formation of albumin advanced glycation end products induced by glucose. Overall, *T. diffusa* extract displays an interesting multi-target activity, validating its ethnopharmacological use. Moreover, the demonstrated neuroprotective cooperative-effects open new perspectives for its possible application as a flavonoid-based strategy to counteract neurodegenerative processes, and therefore, manage CNS disorders and related symptomatology.

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Acknowledgments: FCT/MEC (UID/QUI/50006/2013), FEDER (Partnership Agreement PT2020), NORTE2020, PORTUGAL2020, ERDF (NORTE-01-0145-FEDER-000024), POCTEP (0377_IBERPHENOL_6_E). J. Bernardo (SFRH/BD/129499/2017) and K. João (PD/BD/135084/2017) thank FCT/MEC.

- **15081 | Cyanobacteria from the LEGE Culture Collection: a road for innovation in human health?**

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Ubiquitously distributed through the most different terrestrial and marine environments, cyanobacteria constitute an inspiring source for the search for new bioactive compounds. Of them, carotenoids represent a promising class of secondary metabolites, with recognized beneficial properties for humans' health.

Different cyanobacteria strains of the LEGE culture collection (lege.ciimar.up.pt), namely those belonging to the genus *Cyanobium* (LEGE12431) and *Nodosilinea* (LEGE13457), were explored regarding their pigments profile and biological activities. The strains under study were cultured and scaled-up until 4L culture. After collection, the biomass was lyophilized and used for the preparation of acetonic (100%) and ethanolic (70%) extracts. The extracts were chemically analysed for their pigments profile, by High Performance Liquid Chromatography (HPLC) with Photo Diode Array (PDA) at 450 nm. The carotenoids qualitative and quantitative profile was established, with xanthophylls being dominant over carotenes. The antioxidant activity of the extracts, determined through their capacity to scavenge superoxide radical anion *in vitro*, was positively correlated with their content in carotenoids. In order to find out the potential of these organisms for the treatment of chronic skin inflammatory conditions, the extracts will be screened for their toxicity and further explored for their capacity to reduce inflammation, using the mammal cell model RAW 264.7. Altogether, our results will enrich the knowledge of underexplored cyanobacteria strains, both regarding their metabolome and biological activities.

Acknowledgments

This work was done in the framework of the project BLUEHUMAN - BLUE biotechnology as a road for innovation on HUMAN's health aiming smart growth in Atlantic Area - EAPA_151/2016 of the Interreg Atlantic Area Programme funded by the European Regional Development Fund.

- **15087 | Synthesis of thioxanthenes as potential inhibitors of efflux pumps**

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The rise and spread of antibiotic resistance presents one of the most pressing health issues of our days. The resistance by microorganisms can arise due to a multiplicity of factors, but one underlying factor is the increase of drug efflux pumps. The overexpression of efflux pumps is responsible for the extrusion of drugs, making antibiotic therapy fail, as the quantity of intracellular antibiotic is not enough to provide the desired therapeutic effect.

Thioxanthenes, dibenzo-gamma-thiopyrones, are an important class of molecules showing interesting biological properties, namely antischistosomal activity, antitumor activity, and efflux pump inhibition. Based on these considerations, this scaffold was selected for further studies within the scope of finding new efflux pump inhibitors.

A virtual library of approximately 1000 aminated (thio)xanthenes was designed, among which halogenated amines were selected. The halogenated aminated (thio)xanthenes were chosen based on the docking scores against two bacterial efflux pumps available in the Protein Data Bank, and a model of the human P-glycoprotein.

Taking a brominated thioxanthone as starting material, amination was performed using a copper-catalysed Ullmann type C-N coupling, with K₂CO₃ and methanol in a sealed flask, heated at 100°C, for two days.

Future work will consider the antimicrobial investigation of this series of thioxanthenes.

Acknowledgements: This work was supported through national funds provided by FCT/MCTES - Foundation for Science and Technology from the Ministry of Science, Technology and Higher Education (PIDDAC) and European Regional Development Fund (ERDF) through the COMPETE Programa Operacional Factores de Competitividade (POFC) programme, under the projects POCI-01-0145-FEDER-028736, PTDC/MAR-BIO/4694/2014 (reference POCI-01-0145-FEDER-016790; Project 3599-PPCDT), PTDC/AAGTEC/0739/2014 (reference POCI-01-0145-FEDER-016793; Project 9471-RIDTI) and in the framework of the programme PT2020.

- **15089 | *Mezoneuron benthamianum* Baill.: chemical and biological findings to uphold its traditional applications**

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Mezoneuron benthamianum Baill. is a medicinal species native from Guinea-Bissau, traditionally used in the treatment of topical infections and wounds. Despite the existence of some works on the biological activities of this species, its chemical composition remains poorly studied. Therefore, the purpose of this work was to extend the knowledge on the chemical and biological properties of this species. For this, the phenolic composition of hydroethanolic extracts prepared from *M. benthamianum* leaves and stem bark were analysed by HPLC-DAD. In addition, their capacity to scavenge nitric oxide and superoxide anion radicals were also studied. Some phenolic acids and flavonoids were found in both extracts, leaf being the richest plant material. A concentration-dependent activity was observed against both reactive species, leaves being the most active vegetal tissue, with IC50 values of 18.89 and 112.93 µg/mL for superoxide anion and nitric oxide radicals respectively. The potential of both extracts to inhibit 5-lipoxygenase, an enzyme involved in the inflammatory cascade, is being assessed. Overall, the results suggest that *M. benthamianum* leaves and stem bark are valuable sources to benefit health.

- **15093 | Interaction of 6,9-dichloro-2-methoxyacridine with double stranded DNA**

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The binding of small molecules to double stranded DNA has been a topic of research in the field of anticancer drug design in recent years, since many anticancer treatments include a compound that binds to the DNA molecule.

Acridines are considered an important class of compounds due to their wide variety of biological activities. Acridine derivatives are one of the more studied chemotherapeutic compounds, widely used as antimalarial, antiviral, antibacterial, antitumor, antiprotozoal, and antitubercular agents. This work aims to study the interaction of 6,9-dichloro-2-methoxyacridine (DCMA) with double stranded DNA in aqueous solution, using UV spectroscopy, including UV melting experiments, and viscosity measurements.

Absorption spectra, as well as UV melting curves, were recorded for solutions with constant DNA concentration and different concentrations of DCMA. DNA melting experiments were carried out by recording absorbance versus temperature profiles at 260 nm. DNA denaturation temperature, in each solution, was obtained from the curves of fraction of melted base pairs as a function of temperature. The hyperchromicity of the samples at 260 nm was also obtained for each concentration of DCMA, at the denaturation temperature and at a higher temperature, at which it is assumed that the strands of DNA have been totally separated.

The binding constant of the DCMA-DNA complex, at 293 K, was calculated from UV spectra.

The results obtained by both techniques evidence a noteworthy interaction of 6,9-dichloro-2-methoxyacridine with DNA, affecting the structure and stability of the double helix. These results are expected to provide a deeper insight into the DNA-binding properties of acridines.

Acknowledgements

Thanks are due to Fundação para a Ciência e Tecnologia (FCT), Portugal, for financial support to Project UID/QUI/00081/2013 and to FEDER (COMPETE 2020) for financial support to Project POCI-01-0145-FEDER-006980.

- **15096 | Marine bromophenols as models for the synthesis of halogenated chalcone derivatives**

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In recent years, an increasing number of new compounds have been isolated from marine macroalgae and many of them have been reported to possess interesting biological activities [1]. Among these derivatives, bromophenols such as bis(2,3-dibromo-4,5-dihydroxybenzyl) ether (BDDE) have attracted the attention of scientific community because of its wide spectrum of pharmacological properties [2,3]. Inspired by biological potential of BDDE, some new halogenated chalcones were prepared. The synthetic approach was based on Claisen Schmidt condensations between halogenated acetophenones and benzaldehydes. The structure elucidation of the synthesized compounds was established on the basis of NMR techniques.

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Acknowledgments: This research was partially supported by the Strategic Funding UID/Multi/04423/2013 through national funds provided by FCT - Foundation for Science and Technology and European Regional Development Fund (ERDF), in the framework of the programme PT2020, the projects PTDC/MAR-BIO/4694/2014 (POCI-01-0145-FEDER-016790; Project 3599-PPCDT), PTDC/AAGTEC/0739/2014 (POCI-01-0145-FEDER-016793; Project 9471-PPCDT), PTDC/DTPFTO/1981/2014 (POCI-01-0145-FEDER-016581), and POCI-01-0145-FEDER-028736.

- **15097 | Abiotic and biotic factors shaping the abundance of *Mytilus galloprovincialis* along the Atlantic coast of the Iberian Peninsula**

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The mussel *Mytilus galloprovincialis* Lamarck 1819 is a marine mollusk with ecological and economic relevance in ecosystems. Mussels are ecosystem engineers because they provide habitat for many species, enhancing the biodiversity. This mussel is very abundant in the Atlantic coast of the Iberian Peninsula and it is used for food, being harvested in natural systems and/or cultured intensively on rafts. Aquaculture production at large scale is also dependent on the abundance of mussel in the natural environment because juvenile mussels are collected in natural rocky shores and then attached to ropes on rafts.

In this perspective, the objective of this study is understanding which abiotic and biotic variables affect the abundance of *M. galloprovincialis* along the Atlantic coast of the Iberian Peninsula.

To achieve this aim, its abundance was estimated as the percentage of cover in twenty random quadrats at each of 163 different rocky shores, from Galiza (NW Spain) to South of Portugal (Sagres). Moreover, the abundance of potential predatory species (*Nucella lapillus* (Linnaeus, 1758) and *Straemonita haemastoma* (Linnaeus, 1767)) was estimated in each quadrat. Then, environmental data (e.g. Temperature, Salinity) in the study area were obtained from satellite data, available online. DistLM analysis was used to ascertain the role of the studied abiotic and biotic variables shaping the abundance of *M. galloprovincialis*.

Results showed that twenty-one variables explained 30% of mussel variability and the most significant factors were salinity (9.44%), presence of *Nucella lapillus* (5.76%), iron (2.80%), maximum temperature (1.04%) and primary production (1.19%). Future studies should consider another factors to improve the knowledge about factors shaping *M. galloprovincialis* abundance.

Acknowledgement:

This research was developed under Project No. 30181, co-financed by COMPETE 2020, Portugal 2020 and the European Union through the ERDF, and by FCT through national funds.

- **15111 | Synthesis of marine derived xanthone with antimicrobial activity**

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Recently, marine environment has gained a huge importance in the search of novel secondary metabolites, in the hope of finding new "hits" and "leads" for drug discovery 1. Several marine products show a diversity of biological activities, such as antibacterial and antifungal 2. Infectious diseases are responsible for high morbidity and mortality across the globe. In addition, many antibiotics and other antimicrobials are no longer effective due to the development of resistances 3. These facts justify the high urgency of finding new, effective and safe antimicrobials. In 2013, one new xanthone isolated from marine fungus *Aspergillus wentii* showed antibacterial activity against *Escherichia coli* and *Staphylococcus aureus* and antifungal activity against *Colletotrichum lagenarium* 4.

In this work, we propose the total synthesis of this natural occurring xanthone. Reactions steps such as protections/deprotections, reductions, directed ortho-lithiations, halogen-lithium exchange and oxidations were used to obtain the desired compound. The compound was purified using chromatographic techniques, and its structure was interpreted by spectrometric techniques (FTIR, GC-MS and NMR (1H,13C, HSQC and HMBC)).

Acknowledgements: This research was partially supported by the Strategic Funding UID/Multi/04423/2013 through national funds provided by FCT - Foundation for Science and Technology and European Regional Development Fund (ERDF), in the framework of the programme PT2020 and the project PTDC/MAR-BIO/4694/2014 (reference POCI-01-0145-FEDER-016790; Project 3599 - Promover a Produção Científica e Desenvolvimento Tecnológico e a Constituição de Redes Temáticas (3599-PPCDT)) in the framework of the programme PT2020.

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- **15113 | Identification of new MDM2-p53 interaction inhibitors using yeast cell-based models**

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TP53 is one of the most relevant tumor suppressor genes, which is frequently mutated in human cancers. In about half of human cancers retaining wild-type (wt) p53, the p53 pathway is inactivated due to the overexpression of endogenous negative regulators, particularly murine double minute 2 (MDM2). Therefore, the disruption of the MDM2-p53 interaction represents an efficient and selective therapeutic strategy against wt p53-expressing tumors [1].

Recently, our research group have shown that the antitumor activity of some chalcones can be related with activation of a p53-dependent pathway [2]. In order to proceed with the identification of new p53-activating agents with improved activity, a series of chalcone analogues were synthesized and tested for their MDM2-p53 interaction inhibitory effect. The synthetic approach was based on the reaction of ketones with appropriately substituted benzaldehydes in alkaline medium. The effect on MDM2-p53 interaction was evaluated using a yeast-based screening assay previously developed by our group [2]. Using this phenotypic assay, some of the tested compounds revealed to be potential inhibitors of the MDM2-p53 interaction.

#Authors contributed equally to this work.

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Acknowledgments: This research was partially supported by the Strategic Funding UID/Multi/04423/2013 and UID/MULTI/04378/2013 through national funds provided by FCT - Foundation for Science and Technology and European Regional Development Fund (ERDF), in the framework of the programme PT2020, the projects POCI-01-0145-FEDER-028736, PTDC/MAR-BIO/4694/2014 (reference POCI-01-0145-FEDER-016790; Project 3599-PPCDT), PTDC/AAGTEC/0739/2014 (reference POCI-01-0145-FEDER-016793; Project 9471-PPCDT), and PTDC/DTPFTO/1981/2014 (reference POCI-01-0145-FEDER-016581; Project 3599-PPCDT). Joana Moreira acknowledge for her grant (SFRH/BD/135852/2018).

- **15114 | Synthesis and structure elucidation of new chiral selectors for liquid chromatography**

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The enantioseparation resorting to liquid chromatography and to chiral stationary phases (CSPs) is one of the most versatile and widely applied method to analyse and isolate enantiomers [1]. Over the last few years, CSPs have been applied for resolution of racemates, determination of enantiomeric composition, monitorization of asymmetric reactions, analysis of the stereochemistry of natural compounds, pharmacokinetic, and enantioselective studies [1-4].

The strategies adopted for development of CSPs include, essentially, the introduction of new selectors and chromatographic supports, and different techniques of binding/coating onto chromatographic support [5].

Herein, the synthesis and structure elucidation of new selectors inspired on Pirkle-type CSPs were performed. This type of CSPs are known by their versatility and flexibility since it is possible to create and adapt a variety of small molecules to chiral selectors. In addition, they are compatible with a wide range of solvents used as mobile phase and stable to temperature and pressure [5].

Acknowledgements

This research was developed under the projects PTDC/ MAR-BIO/4694/2014 and PTDC/AAG-TEC/0739/2014 supported through national funds provided by FCT/MCTES, PIDDAC and ERDF through the COMPETE - POFC programme (POCI-01-0145-FEDER-016790 and POCI-01-0145-FEDER-016793) and RIDTI, Project 3599 and 9471, in the framework of the programme PT2020, as well as Project No. POCI-01-0145-FEDER-028736, co-financed by COMPETE 2020, Portugal 2020 and the European Union through the ERDF, and by FCT through national funds, and CHIRALXANT-CESPU-2018.

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- **15115 | Characterization of the genetic profile of a consecutive series of papillary thyroid carcinomas**

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Thyroid cancer (TC) incidence has been continuously increasing and this increase seems to be limited to the papillary thyroid carcinoma (PTC) subtype. Although usually presenting an excellent prognosis, some patients experience disease recurrence, persistence or progression. Initiation and progression of thyroid cancer have been consistently associated with genetic and epigenetic events. Studies have demonstrated the application of genes or gene panels for prognosis determination of PTC and in the individual patient management. BRAF, RAS and hTERTp genes have been described as altered in PTC by our group and others. Yet, discordance has existed on how these genes influence tumor behavior and patient outcome. The main aim of this study is to establish the status of these genes in a non-selected series of PTC patients, in order to correlate gene status with the tumor's clinicopathologic characteristics and patient outcome indicators. 175 samples of primary tumors and lymph node metastases (LNM) from 157 patients were collected, along with the available clinical information. Molecular alterations were detected and confirmed by Sanger Sequencing analysis. Univariate and multivariate analysis were performed to verify if and how mutational status contributed to the development of LNM, distant metastases, patient outcome and PTC related death. We found that BRAF point mutations were associated with aggressive clinicopathologic features but not with worse patient outcome. Conversely, RAS point mutations were related to better patient outcome on univariate analysis. On multivariate analysis we found hTERTp mutations to be a predictive factor for disease persistency, recurrence and progression, being a molecular marker of worse outcome in PTC patients. Vascular invasion was the only predictive clinicopathologic factor for worse outcome. Notably, no additional tumor aggressiveness was observed when hTERTp mutations were concomitantly present with BRAF or RAS point mutations.

- **15120 | Rediscovery and redescription of *Bryodelphax mateusi* Fontoura, 1982 (Tardigrada: Heterotardigrada) an endemic species from Portugal**

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Tardigrades are micrometazoans (50 - 1200 µm) that occur in marine, freshwater and limnoterrestrial habitats. They have a bilaterally symmetrical body with four pairs of lobopodous legs with claws. Tardigrades are known for their ability to undergo cryptobiosis, a state in which metabolism is strongly reduced or discontinued. When in cryptobiosis they are able to resist to extreme environmental conditions [1].

The knowledge of limnoterrestrial tardigrades from Portugal is far from complete and many habitats that may harbour unrecorded species or even new species, are still unexplored. In Portugal about 70 species were recorded, 9 of which are endemic [2,3,4]. One of these species, *Bryodelphax mateusi*, an armoured tardigrade of the family Echiniscidae, was only found in mosses from Serra do Buçaco in 1982 [5].

A new population of this rare species was recently (September 2018) extracted from mosses collected from trees in Bom Jesus, Braga (41°33'18"N; 8°22'35"W). Specimens were sorted under a dissecting microscope and mounted in Hoyer's medium [6]. Measurements and photographs were made under oil immersion, using a Zeiss phase and differential interference contrast Microscope equipped with digital camera and using Zen Imaging Software.

The discovery of this population allowed to make an updated description of this species. *Bryodelphax mateusi* is characterized by having dorsal plates ornamented with granulation and pores. Median plates 1 and 2 divided and median plate 3 undivided. Supplementary platelets present. Ventral plates absent. The lateral filament A is the only present. Papilla and dentate fringe (4-6 teeth) on hind legs present. Internal claws with spurs.

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- **15123 | In vitro screening of neuroactive properties of *Fucus serratus* L. phlorotannin-rich extracts**

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Given the increasingly high incidence of age-related neurodegenerative disorders, researchers have been focusing their attention on the discovery and development of marine-derived products as neuroprotectants [1].

Phlorotannins, exclusively found in brown seaweeds (Ochrophyta, Phaeophyceae), are amongst the most promising marine bioactives.

The formation of advanced glycation end-products (AGEs) has been recognized as a crucial player in the pathogenesis of neurodegenerative disorders, causing neurotoxicity *via* oxidative stress [2]. On the other hand, the inhibition of brain monoamine oxidases (MAO) has been implicated in the attenuation of such stress [3].

This work aims at exploring the neuroactive potential of a phlorotannin-rich extract obtained from *Fucus serratus* L. (Phaeophyceae, Fucales) harvested along the Portuguese coast. Phlorotannin profiling of *F. serratus* extract was established through advanced mass spectrometry tools (HPLC-DAD-ESI/MSⁿ and UPLC-ESI-QTOF/MS) and the dimethoxybenzaldehyde (DMBA) specific assay. In preliminary *in vitro* assays, *F. serratus* extract, rich in low molecular weight phlorotannins, displayed antiradical activity, reduced lipid peroxidation, and significantly inhibited AGE formation. The extract also inhibited the activity of human recombinant MAO-A isoform, in a concentration-dependent manner.

The capacity of the phlorotannin-rich extract to interact with CNS-related targets underpinning neurodegeneration points to the potential interest of the selected seaweed species as promising neuroactive candidate, opening doors for further studies.

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Acknowledgements:

FCT/MEC (UID/QUI/50006/2013), FEDER (Partnership Agreement PT2020), NORTE 2020, PORTUGAL2020, ERDF (NORTE-01-0145-FEDER-000024), POCTEP (0377_IBERPHENOL_6_E). DCS thanks FCT (SFRH/BD/130998/2017).

- **15127 | Cultivation of *Codium tomentosum* a native seaweed specie with commercial potential**

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Europeans are increasingly recognizing seaweeds as a healthy food. With this increase in demand, the risk of overexploiting the natural resources is very high. As such, developing sustainable alternatives of producing biomass is crucial.

Codium tomentosum is an abundant specie with several studies highlight not only its nutritional potential for human food but also its versatility as a source of diverse bioactive compounds with interest for the cosmetic and pharmaceutical industries.

In this project, cultivation methodologies for *Codium tomentosum* were studied. As a first step, trials in the laboratory were performed to determine the best temperature (12°C, 16°C and 20°C), density (5, 10, 15 g/L) and light intensity (100 and 200 $\mu\text{mol m}^{-2} \text{s}^{-1}$) for biomass production. The best results were obtained at 16°C and 200 $\mu\text{mol photons m}^{-2} \text{s}^{-1}$, with no significant differences between the 3 densities tested.

Alongside, this species was also cultivated in an outdoor cultivation system during 2 different seasons of the year (winter and summer). In winter presented a positive growth rate for most of the time and few epiphytes were present, whereas in summer growth was observed during the whole trial. Despite the faster growth of this seaweed in summer, this was also accompanied by overgrowth of epiphytes in the tanks, which compete with *C. tomentosum* for light and nutrients. The biochemical analyses of this seaweed showed that the cultivation process didn't affect the values of antioxidant activities and the content in protein and improved the phenol content.

In conclusion, *Codium tomentosum* is a specie with potential for aquaculture. Further studies are still needed to better understand the best conditions for the cultivation of this seaweed. This work was developed in the context of FCT project INSEAFOOD (Norte-01-0145-FEDER-000035).

- **15134 | Development of cultivation methods for *Ulva intestinalis* - a native seaweed species with commercial value**

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In Europe, interest in seaweed has been increasing steadily during the past decade. *Ulva intestinalis* has several applications with potential for the European market, being even able to constitute a novel food for the crescent blue market. The increasing biomass demand creates a need to develop sustainable methods of cultivation of this species.

Laboratory trials were conducted to study which conditions (temperature, light, density) are best for this species. A first trial tested the effect of three different temperatures (12, 16 and 20 °C) on the growth of *U. intestinalis*. The species demonstrated higher growth at 16 °C, and sporulated the most at 20 °C, suggesting temperature is one of the factors that influence sporulation. The second trial tested the effect of three densities (5, 10 and 15 g/L) at two different photon fluency rates (100 and 200 $\mu\text{mol m}^{-2} \text{s}^{-1}$). Growth was significantly higher at 200 $\mu\text{mol m}^{-2} \text{s}^{-1}$ during the first three weeks of the trial but caused higher sporulation. In the last two weeks, growth at both photon fluency rates did not show significant differences.

Furthermore, an assessment of the growth and biochemical composition seasonality of the algae, cultivated in a tank system in two distinct seasons: winter and spring, was also performed. In the winter trial, *U. intestinalis* demonstrated an opportunistic behaviour, tending to sporulate when light intensity was low and to grow when light exposure increased. In the spring trial, temperatures caused sporulation in the same light levels in which higher growth occurred in the slow-growth trial. This suggests an interaction between the two factors. Biochemical results were inconclusive in determining the best time to harvest *U. intestinalis*.

The obtained results demonstrate that *U. intestinalis* has potential for aquaculture incorporation.

This work was developed in the context of FCT project INSEAFOOD (Norte-01-0145-FEDER-000035).

- **15141 | Laboratory evaluation of the suitability of a geotextile for geomembrane protection in a waste landfill**

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Geosynthetics are polymeric materials applied in many different civil engineering structures, such as waste landfills, due to their high versatility, ease of installation and low cost. The base liner systems of waste landfills (designed to avoid soil and groundwater contamination) are often formed by a combination of geosynthetics: a geosynthetic clay liner (a hydraulic barrier typically consisting of bentonite sandwiched between geotextiles), a geomembrane (impermeable sheet used for fluid containment) and a geotextile. A granular drainage layer (often gravel) is placed over the geosynthetics. The function of a geotextile in a base liner system is to protect the geomembrane from damage (tears or punctures) induced by the particles of the overlying drainage layer.

This work describes the selection process of a geotextile for protecting a geomembrane in a waste landfill. The main goal of the work was to evaluate if the geotextile was suitable for being applied in the base liner system of the landfill. For that purpose, laboratory tests (characterisation and degradation tests) were carried out for determining some relevant properties of the geotextile.

By comparing the results obtained in the laboratory tests with the requirements established by the construction project, it was possible to evaluate the suitability of the geotextile for performing the required function in the waste landfill. For being considered suitable for application, the properties of the geotextile must be in accordance with the construction project requisites (if any property does not comply, the geotextile is considered unsuitable for application).

This work was financially supported by project POCI-01-0145-FEDER-028862, funded by FEDER funds through COMPETE 2020 - "Programa Operacional Competitividade e Internacionalização" (POCI) and by national funds (PIDDAC) through FCT/MCTES.



Base liner system of a waste landfill.

- [15142 | Progressive rock goes to school: a sociology of education perspective of "Another Brick in the Wall" clip](#)

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On its broader sense, education is an institution that dates on antiquity, period when linguistic skills and human socialization were developed. Together with the risen of more complex societies, comes the need to develop an education system focused on values, knowledges and behaviors shared among people.

The essay has the purpose to discuss the relationship between Pink Floyd's clip of "Another brick in the wall" and the sociological approach on education and its transition from a functionalist position to the critic social reproduction theory, which is contemporary to the clip, emerging on the 70s.

The development of the argument bases itself on the chronology of sociology of education along with its historic contexts, as follow: a) structural functionalism approach of Émile Durkheim; b) critic social reproduction approach, based on authors like Bourdieu, Althusser e Saviani, among others, related to the presentation of some frames of "Another brick in the wall" clip.

The critic stablished at the time, both from artists and theorists, has shown a school that reproduces the logics of the current society, cutting off students imagination and individuality by keeping them as instruments of the nation-state. It will be proposed a reflection on whether the ongoing education process still works under this functionalist logic or, if, in the present days, we watch a result of the critic approach movement that led schools to a more democratic environment that preserves each students potentialities and promotes a social awareness.

After all, are we doomed to be free, with our own choices, or are we still just bricks on the invisible wall that uses and limits us?

- **15143 | Computational study of the reaction mechanism of the aromatic L-amino acid decarboxylase, an enzyme involved on the biosynthesis of serotonin and melatonin**

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Melatonin, a hormone involved in sleep regulation, is a molecule whose mechanism of biosynthesis is still poorly understood from a chemical point of view. It is known that this hormone is biosynthesized by the action of four consecutive enzymes, namely tryptophan hydroxylase, aromatic L-amino acid decarboxylase, N-acetyltransferase and hydroxyindole-O-methyltransferase. This project will have a major focus on the study of the mechanism of the second enzyme referred to, the aromatic L-amino acid decarboxylase (AAAD), a PLP-dependent enzyme in which a decarboxylation reaction of hydroxylated tryptophan (5-HTP) to serotonin (5-HT) occurs. This latter molecule also plays a role as important as that of melatonin, since its biosynthesis affects melatonin levels, with reflexes not only in sleep, but also in the control of appetite, sexual desire, aggression, mood, body temperature, and other functions where serotonin is involved. The study of the AAAD enzyme using molecular computational modeling will help to understand the catalytic mechanism of this enzyme. Since there is no three-dimensional structure of the enzyme:5-HTP complex, we combine known similar enzyme:substrate complexes and molecular modeling to build a catalytically competent model of the enzyme:5-HTP complex. The reaction mechanism of the formation of serotonin from 5-HTP by AAAD is studied with quantum mechanics/molecular mechanics calculations. The obtained results will complement the knowledge on the mechanisms of biosynthesis of serotonin and melatonin. In addition, future studies may be developed to model the serotonin and melatonin receptors and develop protocols for new therapeutics for sleep regulation, namely in jet-lag cases.

- **15147 | Papaya seeds: a sustainable by-product of excellence of natural compounds with beneficial effects for health**

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Consumption of tropical fruits has been increasing in international markets due to their nutritional and organoleptic properties. However, during the fruit production, a high generation of by-products such as skin, seeds and non-edible pulp are obtained [1]. Disposal of these by-products represents a serious problem related to waste handling, environmental considerations, legal restrictions and economical limitations [2]. Currently, an alternative to decrease this problem is to use these by-products in the design and development of functional foods or nutraceutical ingredients. Despite this, many countries such as USA, Australia and European Union do not use the papaya by-products [3]. According to some authors, 6.51% of seeds, 8.47% of skin and 32% of unusable pulp are produced during papaya processing [1].

The main natural bioactive compounds reported in papaya seeds are carotenoids, phenolic acids and flavonoids [1]. Due that, papaya seeds could be used as source of antimicrobial, antioxidants, colorants, flavouring and thickening agents [1]. In this work, we reviewed nutritional composition and overview the main compounds associated with health beneficial effects, namely those with interesting biological activities that have been described in papaya seeds with economic potential for several applications [1-3]. More studies about the functional properties of papaya by-products are needed.

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- 15148 | Phytotoxicity assessment of nano-NiO in *Solanum lycopersicum* L. under *in vitro* conditions – growth dynamics and photosynthetic pigments

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The growth expansion of industrialization and the progress of technology has a direct impact in the emission of contaminants to the environment, where they can affect all living organisms. Although nanotechnology has its benefits, with several industrial and medical applications, it also contributes to the release of different nanomaterials (NMs) to the environment, which can easily interact with plants due to their small size and unique features. However, knowledge about the potential risks of different NMs to plants is still limited. In this way, this study aimed to evaluate the effects of nickel oxide NMs (nano-NiO) on *Solanum lycopersicum* L. (tomato plants) growth under *in vitro* conditions. Indeed, although nickel is an essential micronutrient for plant growth, the presence of high levels of this metal can induce phytotoxicity at multiple stages. For this purpose, seeds of *S. lycopersicum* cv. Micro-Tom were cultured in half-strength Murashige and Skoog (MS) media, supplemented with 1.5% (w/v) sucrose, containing 30 mg/L of nano-NiO. After 14 days of growth, plantlets were collected and used for the evaluation of growth (total fresh weight, root and shoot length) and photosynthetic pigments. The analysis of the obtained results showed that, although root and shoot length was not affected by nano-NiO, a reduction of 30% in total fresh weight, in comparison with the control, was observed. Moreover, nano-NiO also induced inhibitory effects in the photosynthetic pigments, mainly in the content of chlorophylls, with a clear tendency to show reduced values in comparison to the control. Based on this set of preliminary results, it can be concluded that 30 mg/L NiO NMs impaired the normal plant growth and, in the future, studies will be designed to assess the biochemical basis of nano-NiO phytotoxicity, as well as to test the potential of different antioxidants (e.g. proline, ascorbate, glutathione) to increase tomato tolerance to nano-NiO.

- **15153 | Musculoskeletal complaints of lumbar origin in Portuguese university students.**

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Lumbar musculoskeletal problems are frequent throughout life, being one of the main causes of loss of quality of life, according to the latest official data¹.

This study was intended for undergraduates under 25 years, in order to assess to what extent this problem occurs in the university population.

For that, the Nordic musculoskeletal questionnaire was used, in its Portuguese version², adapted for online use. Its dissemination was achieved through the valuable help of student associations, based on AEICBAS links.

As a result, there were 787 valid responses to the questionnaire presented, namely the occurrence of episodes with some disability in the previous year. Of these 787 responses, 60% reported having at least one occurrence in the previous year. Of the total number of complaints reported, 81% were female and 19% male.

The values collected in this study suggest the need for a more exhaustive evaluation of the data thus obtained, since the problem seems to affect three fifths of the study group.

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- **15159 | Development of lipid nanoparticles containing LEM2 for topical treatment of skin cancer**

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Skin cancer affects millions of people around the world, being a major public health concern. Nanotechnology is a promising strategy to improve the treatment of skin cancer since it allows solving several limitations related to conventional therapeutic agents, such as their deficient water solubility, incapacity of targeting, nonspecific distribution, systemic toxicity, and low therapeutic effect. LEM2 is a synthetic xanthone derivative with tested antitumor effect in different cell lines including melanoma (work submitted for publication). However, this compound presents poor aqueous solubility, which is often linked with poor bioavailability. Thus, the aim of this study was to encapsulate LEM2 into nanostructured lipid carriers (NLC) for topical delivery in order to enhance the skin permeation and bioavailability of this compound. Empty nanoparticles (NLC) were produced by high pressure and high shear homogenization methods. NLC mean size, polydispersity index and zeta potential were evaluated by dynamic light scattering (DLS). The pH values of NLC colloidal dispersions were also measured. LEM2 was encapsulated in NLC using the high shear homogenization method. LEM2 loaded NLC were characterized by the methods described above and the encapsulation efficiency was also determined by an "in house" high performance liquid chromatography (HPLC) method. The presence of the compound increased the mean size of NLC ($227.2 \pm 4.7 \text{ nm}$), and the values of polydispersity index and zeta potential were 0.310 ± 0.006 and $23.90 \pm 0.90 \text{ mV}$, respectively. The encapsulation efficiency was 36.25%. In future work, the impact of NLC on LEM2 antitumor activity against skin cancer will be evaluated.

- **15161 | Investigation Proposition: Barriers and facilitators of the report by General Practice Doctors of cases of Domestic Violence**

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Introduction: Domestic violence is a serious and preventable public health problem. It comprises actual or threatened psychological, physical or sexual harm perpetrated by a current or former partner. Even though the number of reported cases has increased in recent years, it is thought that only a small percentage of domestic violence episodes are reported. Many studies have proven that victims of domestic violence tend to have more health problems and frequently ask for medical help in the context of both acute and chronic health sequels. General practice doctors, by having contact with their patients and family for long periods of time, are in a particularly privileged position to detect cases of domestic violence. Having in account that in Portugal domestic violence is a public crime, doctors that know about a domestic violence episode have the duty to report it to the authorities. Still, little is known about what motivates doctors to present, or not, an official report.

Objectives: To understand the common view of general practice doctors about domestic violence, what experience they have dealing with these cases and what factors may lead them to report, or not, episodes of domestic violence to the authorities.

Methods: The project is going to be based on semi-structured interviews, performed on ten to twenty general practice doctors of each of the five Health Regional Administrations of continental Portugal. These interviews are going to be conducted either in person or through Skype and audio recorded for posterior analysis. The participants are going to be recruited through their work email address and asked to sign a consent form emphasizing their rights as voluntary participants. All the information provided by participants will be anonymous and confidential. The interviews will be transcribed by the researcher, coded and analyzed, using thematic analysis techniques.

- **15163 | Automatic Detection of Physiological Events in Neurocritical Patients**

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Patients with acute brain lesion are admitted in neurocritical care units in hospitals for many reasons, such as brain trauma or cerebrovascular diseases. Frequently, these patients develop intracranial hypertension phenomena such as plateau waves, which may cause secondary injury. Plateau waves have been defined as a sudden increase of intracranial pressure(ICP) above 40 mmHg during at least 5 minutes. They may be triggered by a vasogenic positive loop activating vasodilation and are accomplished with an increase in cerebral blood volume(CBV) and a decrease in cerebral perfusion pressure(CPP). A brain with active brain autoregulation can block the vasodilation with a vasoconstriction and restoring ICP to normal values. If the brain autoregulation is impaired, an increase in ICP will potentiate the vasodilation and would increase continuously the ICP. Apart from ICP and CPP, neurocritical patients have multimodal monitoring with arterial blood pressure(ABP), heart rate(HR), cerebral blood flow and others. The continuous evaluation and management can reduce secondary brain injury and improve prognosis. The aim of this work is to develop an algorithm that automatically detect and if possible predict the development of a plateau wave, based on multimodal monitoring. The algorithm will be developed in MATLAB using supervised machine learning techniques that are capable, based on known input and output values, to build a model that according to data and its behaviour fits better and gives the best result. This project is being developed in partnership with Biomedical Engineering and the neurocritical care unit(NCCU) of Centro Hospitalar Universitário São João(CHUSJ). The anonymised monitoring data provided will be used to train and test the algorithm. It is expected that the algorithm developed could provide a fast, feasible and easy way to earlier detect plateau waves and other intracranial hypertension phenomena to intervene in time and try to avoid secondary brain lesions.

- **15167 | Feminisms, Internet and Learning Objects: A Proposal for Art Education**

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This presentation aims to investigate the way in which feminist studies can relate to the internet in the context of the Visual Arts classes in Brazilian high schools. With this, we present a discussion about the origins and consequences of feminists' experiments on the internet, emphasizing in the way we relate to technologies as part of the processes of our subjectivities' construction. The theoretical framework that underlies our discussion has as its starting point the essay *A Cyborg Manifesto*, written by Donna Haraway (2009), unfolding in the Remedios Zafra's idea of "a connected room of one's own" (2011) and its possibilities of relations with the multidimensional notions of subjectivities proposed by Félix Guattari (1992). It is also structured around the definitions of Learning Objects (LO) and Poetic Learning Objects (PLO), the latter proposed by Tatiana Fernández (2015). We used as methodology the propositions of the Arts-Based Educational Research (ABER) to create a PLO named *in_filtrate*. The *in_filtrate* links the possibilities of poetic learning to the relationships between the subjects, the technologies and the feminist perspectives presented in this research. Finally, we analyze the main characteristics of the proposed PLO and possible openings that the discussion of these themes can bring to Art Education.

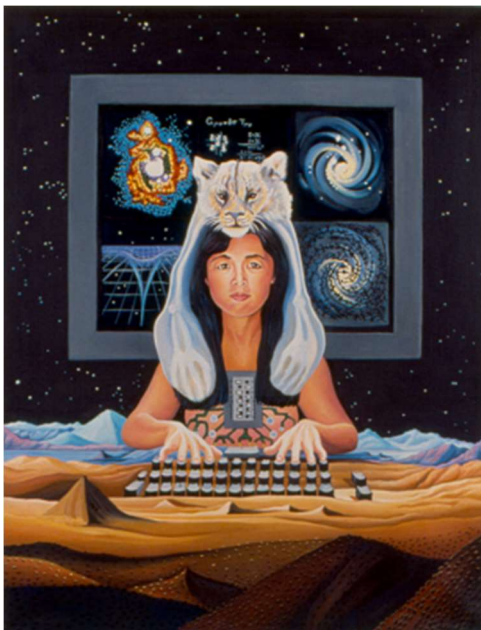
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Lynn Randolph, *Cyborg*, 1989.

- **15173 | Itinerant memorial to the victims of the fires in 2017**

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This project is a proposal for the building of a memorial to the victims of the recent fires of October 15th and June 17th 2017 in Portugal. In those two tragic days many people died and other were left without their houses and properties. In total, during those days there were 115 mortal victims, 325 people injured and about 107 000ha of burned area.

In our current senior year at the University of Porto Fine Arts Sculpture's program we were challenged, in one of our specialization courses, to develop a concept for a memorial in an area affected by the fires. Considering that a memorial is a comprehensive concept that is frequently associated with sculpture or architecture as a way to signal a special event or preserve a memory, our interest was to challenge the conventional approaches.

We started by developing our approach based on the idea of a "human chain" as a symbol of solidarity among population and firefighters. Because we feel compelled to honour the human effort in these traumatic situations, we decided to define a concept of memorial that could be disseminated in the various regions of the country. This way we believe we are contributing to reinforce a symbolic connection between the various regions affected by this tragedy and simultaneously increasing the sense of emotional support among the victims. Therefore, instead of a stone memorial we propose to develop a sculptural concept as a sign of renovation in a social and environmental friendly way. Our memorial project implies the use of common materials in the Portuguese building activity together with a selection of trees species that are more resistant to fires, commonly known as "firefighter's trees".

Along with the various memorials installed throughout the country, it will be distributed a map that depicts all the memorials installed. This map will support the memorials visibility and promote people to visit them and get to be more familiar with the locals, villages and territories harmed.

- **15174 | 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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Insects are all around us. They have colonized virtually every terrestrial and freshwater habitat and now amount to over a million known species of essential herbivores, predators and decomposers. That being said, understanding the ecology of insects and the way in which human activities influence them, is a vital step to promote preservation of wildlife.

This work has two main goals: to characterize, in two areas, a selection of families of the orders Coleoptera and Hemiptera in a one-year cycle regarding the species richness and the number of individuals and to compare the results obtained in both areas.

Two sampling sites were chosen: Parque Oriental da Cidade do Porto (POP), an urban park, and the area around the village of Couce (Valongo, a Site of Community Importance of the Natura 2000 network and part of the Parque das Serras do Porto) in the valley of the river Ferreira.

Sampling was performed by sweep net, with three replicates for both sampling sites and a sweeping period of ten minutes for each replicate. Targeted families were conserved in 70% ethanol for later identification. Captured individuals were identified using a stereomicroscope and the available identification keys.

Despite initial expectations, the species richness and the number of individuals captured at Couce were lower than those at POP. This is likely due to the vegetation clearing for fire prevention conducted at Couce, which decreased the density of herbaceous and shrub-like vegetation in the valley.

As the work progresses, seasonal variation should be expected. The species richness and the number of individuals in both sites should increase significantly (more markedly in Couce). A variation in these parameters between densely planted areas and herbaceous or scarcely planted areas is also expected.

- **15176 | The contribution of the estuaries of northern Portugal to global warming**

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The continuous increase of emissions of greenhouse gases to the environment, such as carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O), and chlorofluorocarbons, leads to the increase of their concentration in the atmosphere with commensurable impact on the climate. In the last 100 years, the global average temperature has increased by 0.6 °C, and forecasts point to a quite larger increase in the next 100 years, if no corrective action is taken. Our research focused on two of the gases responsible for global warming, CH₄ and N₂O, due to their high capacity to absorb infrared radiation. Estuaries are one of the natural sources of emissions of those gases to the atmosphere. As such, the objectives of this work were to estimate the emission of N₂O and CH₄ to the atmosphere by Douro, Ave, and Cávado estuaries, as well as to ascertain the possible regulation of emissions. Water and sediment samples were collected seasonally at three different sites at each estuary. N₂O and CH₄ water levels were determined by GC-ECD and GC-FID, respectively. Additionally, the emissions of these gases by sediments were estimated using slurry incubations. The presence of dissolved CH₄ and N₂O was detected in all locations, with higher levels generally found in low salinity upstream sites. Preliminary results indicate that the Douro estuary appears to be the main estuarine emission source of CH₄ and N₂O in the studied area. Controlling factors of the gas emission are being investigated in order to assess possible mitigation measures.

Acknowledgments: Project UNNOWN (PTDC/BTA-BTA/31098/2017), co-financed by COMPETE 2020, Portugal 2020 and the European Union through the ERDF, and by FCT through national funds. FCT postdoctoral grant (ref. SFRH/BPD/110730/2015) funded through POCH, cofunded by MCTES and the European Social Fund.

- **15177 | Toxicity assessment of two commercial pesticides: lambda-cyhalothrin and lambda-cyhalothrin nano-based formulation**

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Nowadays, the development and use of ecofriendly formulations of pesticides, including encapsulated and nano-encapsulated active ingredients is becoming more frequent, once they are described as potentially safer and more effective than the conventional formulations. However, the mechanisms involved in the effectiveness of these new compounds remain largely unknown, consequently their toxicity and environmental impact, particularly in the terrestrial compartment, need to be addressed. The aim of this work is to perform a comparative toxicity analysis of the commercial formulation containing lambda-cyhalothrin (Karate, Syngenta) and its more recent commercial nano-encapsulated formulation (Karate Zeon, Syngenta). This chemical formulation ($C_{23}H_{19}ClF_3NO_3$) is approved as a pyrethroid insecticide, modulator of sodium channels, in most European Union countries (<http://sitem.herts.ac.uk/aeru/iupac/Reports/415.htm>). The aim of this study is to assess the toxicity of the nano-based formulation, in comparison with its previous formulation. For this purpose, two species of soil invertebrates (*Eisenia fetida* L. and *Folsomia candida* L.) and four species of terrestrial plants (*Lactuca sativa* L., *Solanum lycopersicum* L., *Hordeum vulgare* L. and *Avena sativa* L.) were selected as test species for ecotoxicological tests. These organisms were chosen due to their importance in soils dynamics, soil functions and economical relevance, as well as due to their recurrent use in standard assays. Reproduction, avoidance, seed germination and seedlings growth tests will be conducted on artificial OECD soil, testing eleven concentrations of both formulations in an artificial soil, following standard guidelines. At the end of the assessments, toxicity data for each species will be generated and it is expected to clarify if there are differences in the toxicity behavior of both formulations.

- **15178 | Determining the impact of dendritic cells in T-cell leukemia/lymphoma**

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As in normal T-cell development, cells from the microenvironment support both the initiation, as well as the progression of T-cell acute lymphoblastic leukemia (T-ALL). Study of the TEL-JAK2 transgenic mouse model of T-cell leukemia/lymphoma revealed significant alterations in thymic stromal cell composition, including an increase in Dendritic Cells (DCs). CD8 α + DCs, which are part of the thymus normal/diseased microenvironment, are the only DC subtype that matures inside the thymus, in parallel to T-cell development. Based on this evidence, we aimed to identify which DCs, and in what proportion, are increased in leukemic TEL-JAK2 transgenic mice. Furthermore, we aimed to assess the possible impact of a specific DC subset, in leukemia/lymphoma development. To achieve this goal, TEL-JAK2 mice, were combined with Batf3+/- or Batf3-/- genotype. The Batf3 knockout results in the ablation of CD8 α + DCs in lymphoid organs, allowing the assessment of the effect of this specific DC subtype, on disease development and severity. A significant increase in the total DC population of the thymus was observed in leukemic mice, although the proportion of specific subsets of DCs analyzed, namely plasmacytoid, resident and migratory conventional DCs, were not altered. TEL-JAK2 transgenic Batf3 knockout mice did not differ from Batf3 heterozygous littermates, regarding the age of leukemia onset (median survival of 11.75 and 11.5 weeks, respectively) and lymphoid and non-lymphoid organ weight. Leukemia cell invasion analysis showed that the Batf3 knockout transgenic mice had a higher level of organ invasion than heterozygous littermates, which might indicate that the absence of CD8 α + DCs somehow attenuates the invasion potential of the leukemic cells. Our work provides evidence that DCs are increased in the thymus of leukemic mice, and that CD8 α + DCs specifically might probably have a role in controlling leukemic cells propagation throughout the body.

- **15183 | Influence of the environment on pre-eclampsia: a preliminary spatial-temporal analysis**

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Pre-eclampsia is a disease characterized by increased blood pressure during pregnancy. This condition is globally the main cause of maternal death and has consequences for the fetus, such as preterm birth or fetal death. Air pollution is one of the risk factors for several diseases, but there are other environmental parameters of interest in epidemiological studies, such as temperature, relative humidity, atmospheric pressure and the amount of vegetation.

A preliminary retrospective study using pre-eclampsia hospitalizations as outcome was performed, considering the variables temperature, relative humidity, atmospheric pressure, NDVI (normalized difference vegetation index) and several atmospheric pollutants, namely benzene, monoxide carbon oxides, nitrogen oxides, ozone, particulates and sulphur dioxide.

Punctual data from meteorological stations and satellite data were used to obtain the concentrations of the environmental variables. Pre-eclampsia data was estimated as the ratio between the number of pre-eclampsia cases and the total number of births. All data were used with a monthly time resolution and a spatial resolution at the level of the districts of Aveiro, Braga and Porto, from 2001 to 2015.

Pre-eclampsia was weakly and positively correlated with some air pollutants such as carbon monoxide ($r = 0.147$), PM10 ($r = 0.103$), nitrogen oxide ($r = 0.108$), nitrogen dioxide ($r = 0.144$) and sulphur dioxide ($r = 0.113$), whereas it was negatively and weakly correlated with ozone ($r = -0.110$), temperature ($r = -0.092$) and moderately correlated with NDVI ($r = -0.414$).

This is the first known study using remote sensing data to estimate the concentration of several environmental variables within the scope of a pre-eclampsia epidemiological study. The obtained preliminary results, showing a relation of pre-eclampsia with some pollutants and the vegetation index, require further studies with more complex (multivariable) models in order to consider confounding factors.

- **15185 | Seeking for new p53-activating agents**

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The p53 tumor suppressor protein is a major anticancer therapeutic target due to its involvement in all hallmarks of cancer. Actually, the activation of p53 inhibits crucial cancer processes associated with high proliferation, metastasis and angiogenesis [1]. In about half of human cancers, the TP53 gene is inactivated due to mutation, which is often associated with poor prognosis, particularly increased drug resistance [1].

In the present work, we report the identification of a new compound (called HR-53) with pronounced antitumor activity against mutant p53-expressing tumor cells. Moreover, in mutant p53-expressing SW837 cells, HR-53 induced cell cycle arrest and apoptosis, and increased the protein expression levels of several p53 target genes. In addition, HR-53 led to mutant p53 thermal stabilization, suggesting a possible interaction with mutant p53. These results suggest that HR-53 is a potential reactivator of mutant p53 to be explored in future works.

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Acknowledgments: This research was partially supported by the Strategic Funding UID/Multi/04378/2013 through national funds provided by FCT - Foundation for Science and Technology and European Regional Development Fund (ERDF), in the framework of the programme PT2020, and the project (3599-PPCDT) PTDC/DTP-FTO/1981/2014 - POCI-01-0145-FEDER-01658. Helena Ramos thanks FCT for her fellowship (SFRH/BD/119144/2016), and the BiotechHealth Programme (Doctoral Programme on Cellular and Molecular Biotechnology Applied to Health Sciences; PD/00016/2012).

- **15187 | Consumption of Dietary Supplements among Students from University of Porto**

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Introduction: Dietary supplements (DS) are intended to complement / supplement the normal diet regimen and shouldn't be used as a substitute for it. Its popularity and consumption have been increasing over the years.

Objective: Assess the consumption, type, reasons, monthly expenses and sources of information in the selection of dietary supplements.

Methods: A digital questionnaire was developed and sent to students belonging to 14 faculties of the University of Porto in order to collect personal data, including anthropometric data, physical activity level and dietary supplement use. After proper screening, 813 questionnaires were analyzed.

Results: From all students surveyed, 27,4% reported consuming DS, with male students being more likely to do so ($p < 0,001$). The most consumed DS were *whey* protein, caffeine, multivitamins/minerals, magnesium and vitamin D. The main reasons for consuming dietary supplements were gaining muscle mass (significantly higher in male students, $p < 0,05$), reducing fatigue and being healthy. On average each student spends 20.4 EUR per month and their main sources of information are the internet, nutritionists, scientific articles and doctors. Female students are more likely to choose the doctor as a source of information, while male students are more likely to choose the nutritionist ($p < 0,05$). Male students are more likely to be athletes and to practice physical activity ($p < 0,05$). The practice of physical exercise is positively associated with the consumption of DS ($p < 0,05$).

Conclusion: It is important to develop activities that allow qualified health professionals (nutritionists) to educate people about the responsible use of DS.

Keywords: Dietary supplements, Students, Physical Activity, BMI

- **15189 | Study of the Cultivable Actinobacteria Associated with the Marine Sponge *Hymeniacidon perlevis***

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Bacterial resistance to antibiotics is a serious problem to society and it is causing many concerns in the human health. In addition to multiresistant bacterial infections, cancer diseases are also very serious and highly mortal, and for many of them no effective treatment is available. Actinobacteria are a group of microorganisms well known for their remarkable capacity to produce bioactive molecules with several biotechnological applications, including important antimicrobial and anticancer compounds. Oceans represent a wealthy and underexplored source of new bioactive compounds due to their vast ecosystems, very different from the terrestrial ones.

This study had as objective to investigate the community of Actinobacteria associated with a marine sponge - *Hymeniacidon perlevis* - using a culture dependent approach. The potential of each actinobacterial isolate to produce secondary metabolites with antimicrobial, antifungal and anticancer properties will be explored in a near future. The marine sponge used in this study was collected in the intertidal zone of Praia da Memória, in the north of Portugal. For the isolation of Actinobacteria, different pretreatments and selective culture media were used. The selection process allowed the isolation of 185 strains of which 118 were taxonomically identified through 16S rRNA gene sequencing. Several rare actinobacterial genera have been isolated from the studied sponge such as *Nocardia*, *Nocardiopsis*, *Brevibacterium*, *Gordonia*, *Tsukamurella*, but a high abundance of *Streptomyces* isolates was also obtained.

- **15192 | The impact of normal and tumor extracellular matrix on colorectal cancer cell stem-like properties**

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Colorectal cancer (CRC) is one of the most common types of cancer worldwide. To improve conventional diagnosis and treatment, not only cancer cells but also other elements of the tumor microenvironment need to be considered. The extracellular matrix (ECM), the most abundant element at this microenvironment, is a dynamic macromolecular structure that provides mechanical support to tissues, serves as storage of several growth factors and has also been recognized as a crucial modulator of cell behavior. In CRC, the ECM is remodeled and reorganized, inducing biochemical and biomechanical modifications which increase its stiffness and cause an impact on cellular differentiation, invasion, sustaining the cancer stem cell (CSC) niche. CSC represent a small subpopulation of cells with the ability of self-renewal and clonal tumor initiation. Abnormal changes of the ECM are known to alter cellular differentiation, polarity and induce epithelial-to-mesenchymal transition.

The objective of this work is to evaluate the impact of normal and tumor ECM on CRC cell stem-like properties and to 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. The repopulation procedure was optimized and characterized by immunofluorescence and confocal microscopy. Normal and Tumor Matrices were successfully recellularized with CRC cells. Expression of stem cell markers was evaluated by flow cytometry. Our results evidenced that CRC cells in normal or tumor matrices displayed identical levels of CSC surface markers. Nevertheless, tumor matrices induced CRC cells to express and secrete higher levels of TGF- β and lower levels of TNF- α . Importantly, qRT-PCR analysis revealed that tumor matrices alter the expression of certain stemness-associated genes (SLUG, Vimentine, ZEB1). In conclusion, normal and tumor ECM are capable of differently modulate CRC cells stem-like properties.

- **15193 | Magnetic nanodiscs for biomedical applications**

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Almost one and a third million people died from cancer in Europe in 2014, which equated to more than one quarter (26.4 %) of the total number of deaths. The current cancer therapies are commonly associated with undesirable side effects, due to their cytotoxic and poor tumor targeting. A major advance in therapy could be achieved if drug carriers presented an efficient dual triggering: treatment and transport/release of the drug at the target tumor site. In this context, this project aims to develop a novel multimodal generation of targeted nanocarriers, loaded with anticancer drugs and combined with a magneto-mechanical action through a magnetic core. Beyond the use of classic magnetic spherical nanoparticles, novel and promising high-aspect-ratio nanoparticles synthesized by template assisted nanofabrication and lithography will be optimized, with unique spin configurations.

Currently, the work is being developed in collaboration with Universidade del País Vasco (UPV), where an interference lithography system is used to create templates with the desired dimensions. Then Ti/Fe/Ti nanodisks of different sizes are deposited in a vortex state spin configuration at Faculdade de Ciências da Universidade do Porto (FCUP). The morphological, structural and magnetic properties of those nanostructures are being studied to understand the influence of the nanodiscs dimensions in their application in magneto-mechanical cell damage.

- **15199 | Computational study of the PhaA enzyme, a key for the synthesis of bioplastics**

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Plastics are polymeric materials widely used by humans in applications that include, among others, packaging, aircraft engineering and medicine. The main reason behind the widespread usage of plastics is the fact that they are inexpensive, light and durable. However, the increasing consumption of plastic materials raise important concerns for our society, since most petroleum-based plastics take from 450 to 1000 years to degrade. Thus, the development of more sustainable alternatives has attracted significant attention. Polyhydroxyalkanoates (PHA) are natural polyesters that arise as environment-friendly substitutes to conventional plastics. These compounds are naturally produced by numerous bacteria as an energy storage material, usually in the presence of an abundant carbon source. PHAs share similar properties to common synthetic plastics and can also be synthesized at an industrial scale using specific bacterial strains. The PHA biosynthetic pathway is catalyzed by the sequential action of three enzymes: Acetyl-CoA acetyltransferase (PhaA), Acetoacetyl-CoA reductase (PhaB), and PHA synthase (PhaC). Despite the PHA synthesis has been extensively studied in various microorganisms, the catalytic machinery behind each biosynthetic enzyme is still poorly understood.

In this work, we have applied computational methods to study PhaA, the first enzyme of the PHA biosynthesis, responsible for the condensation of two acetyl-CoA molecules into acetoacetyl-CoA. A detailed analysis of the available crystallographic structures of PhaA from different organisms allowed for a better understanding of the active site environment, the substrate binding pocket, and the orientation of the catalytic residues. This knowledge will be employed in subsequent computational Quantum Mechanics/Molecular Mechanics methodology that will clarify, with atomic-level detail, the PhaA catalytic mechanism.

- **15211 | Development and characterization of transdermal delivery system of an antiemetic**

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The hydrochloride salt form of promethazine, a phenothiazine derivative with antihistaminic, sedative and antiemetic properties. Promethazine hydrochloride also blocks the central histaminergic receptors, thereby depressing the reticular system causing sedative and hypnotic effects. In addition, promethazine hydrochloride has also centrally acting anticholinergic properties and probably mediates nausea and vomiting by acting on the medullary chemoreceptive trigger zone.

In the field of topical and transdermal drug delivery, PLO (Pluronic lecithin organogel) is emerged as one of the most novel and effective topical vehicle base for the drugs that have to be taken by injection or by mouth. In addition, PLOs have the advantage of being thermodynamically stable, viscoelastic, and biocompatible gel, and have specific and localized action, increasing the potential analgesic effects at the painful site. Thus, PLO appears to be an effective alternative vehicle for delivering a drug through the topical and transdermal route.

PLO it is made up of two phases, first pluronic phase (aqueous phase) and second lecithin phase (oil phase), i.e., pluronic gel combined with a lecithin based oil. When the aqueous phase (pluronic gel) is combined with the lecithin oil base creates an emulsion that forms together due to the pluronic gel and the viscosity of that gel at room temperature.

The objective of this study was to develop a transdermal gel with antiemetic action. The rheology and texture were investigated as well the pH, centrifugation test and particles size analysis.

- **15214 | Molecular modifications on hydroxycoumarins**

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Coumarins are oxygen-containing molecules with a benzopyrone nucleus and with derivatives identified as secondary metabolites from plants, micro-organisms, and animals.¹ Coumarin itself and its derivatives have been attracting great interest because of the diversity of biological activities reported.¹ Click chemistry reactions are popular between chemists for their advantages in organic synthesis such as good yields, low by-products formation, selectivity, and simplicity.² The copper-catalyzed alkyne-azide cycloaddition (CuAAC) emerged as the first and leading example of a "click chemistry" reaction.² In this work, three hydroxycoumarins were selected for molecular modification applying CuAAC. This type of reaction originates a triazole linked derivative of the original compound which could offer several advantages, because of its stability, amide bioisoster properties and due to several biological activities associated to this privileged motif.³ Firstly, the three selected hydroxycoumarins were submitted to propargylation to obtain the respective alkyne intermediate. Afterward, the three propargylated coumarins were submitted to microwave assisted CuAAC with acetoglucose azide (in-house synthesis) in order to obtain the desired coumarins linked by a 1,2,3-triazole to an acetylated glucose. The structure elucidation of the six synthesized coumarin derivatives was established by IR, ¹H NMR and ¹³C NMR.

Acknowledgements:

This work was financial supported under the projects PTDC/MAR-BIO/4694/2014 (reference POCI-01-0145-FEDER-016790; Project 3599-PPCDT), PTDC/AAGTEC/0739/2014 (reference POCI-01-0145-FEDER-016793; Project 9471-RIDTI) and POCI-01-0145-FEDER-028736.

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- **15217 | Visual exploratory behavior of bottles and labels and how it relates to the purchase decisions and perception of wine quality**

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The decision-making process when buying wine is complex and involves risk, mainly because the wine's quality can only be assessed after it is bought. The choice is primarily guided by the bottle's visual salience in the shelf, but possible indicators of the wine's quality, such as aesthetic and informative properties of the label, are proved to be decisive. The goal of this study is firstly to understand which label features mainly modulate consumers preference, and, based on this knowledge, how preference for a label modulates the perception of wine's quality.

The study is composed by three tasks: an eye-tracking study to analyze the pattern of shelves exploration and visual fixation; a second study to assess several labels with visual and self-report measures; and lastly a wine tasting study where labels with different evaluations related to different wine qualities are presented, with self-report and psychophysiological measures, namely heart-rate variability and pupil dilatation. All tasks will be applied on a sample of both novice consumers and expert consumers, in order to include possible experience effects.

The results of this study provide an understanding on the factors that influence the wine choice decision-making process, such as labels properties, and also on how these factors can objectively alter the perception of wine's quality. The inclusion of samples with different experience levels also represents an innovation regarding the present literature, which mainly resorts to novice consumers. Preliminary results on the characterization of novice and expert wine consumers will be presented.

(Project grant PP-IJUP2017-SOGRAPÉ-37)

- **15219 | Computational Insights on the Mechanism of Serotonin N-acetyltransferase – The main regulator of melatonin synthesis**

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Melatonin (N-Acetyl-5-methoxytryptamine) is a hormone produced and released in the brain, essentially by the pineal gland, whose synthesis is connected to the circadian cycle. The production of melatonin also occurs in the skin and intestinal tract, where the hormone exhibits antioxidant, oncostatic and anti-inflammatory effects. Melatonin is synthesized from L-tryptophan, through a 4-step reaction mediated by 4 different enzymes: tryptophan hydroxylase, aromatic L-amino acid decarboxylase (AADC), arylalkylamine N-acetyltransferase (AANAT), and N-acetylserotonin methyltransferase. AANAT is a small globular protein that catalyses the transfer of an acetyl-Co-A group to serotonin converting it into N-acetyl-serotonin, being the main regulator of melatonin synthesis.

This work aims to study the mechanism of AANAT. For this purpose, computational methods will be used, namely the ONIOM method that allows the treatment of different parts of the enzyme with different theoretical levels. In short, the enzyme is divided into two regions, a high layer that comprises the most important residues for the reaction, and a low layer containing the remainder of the protein residues. The high layer is treated with high-precision methods - quantum mechanics theory, while the low-layer is treated with a less precise method - the molecular mechanics theory.

Our model of AANAT was built from the PDB file 1KUV. The results so far suggest that the reaction mechanism of AANAT unfolds in a two-step process. The first is the deprotonation of the amine group of serotonin (from -NH₃⁺ to -NH₂) by the neighboring Glu132, (or His93) and the second is the nucleophilic attack of the same amine group to the carbon of the acetyl group of acetyl-CoA.

The study of the catalytic reaction of AANAT is of extreme importance for the understanding of the processes involved in melatonin synthesis. The characterization of the active site of AANAT may also allow the development of new drugs targeting it.

- **15222 | Dissecting the niche for haematopoietic stem cells expansion at the developing haematopoietic system - foetal liver crossroads**

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Haematopoietic stem cell (HSC) transplantation is the definitive treatment for several fatal haematological diseases. Widely used sources of HSC yield limited numbers of HSC, urging the need to develop strategies for efficient HSC expansion *ex vivo*. Although HSC expansion on the adult bone marrow (BM) at steady-state has not been reported, evidence is large for its occurrence in the foetal liver (FL). Understanding and mimicking the biological processes taking place when the adult haematopoietic system is developing is anticipated to translate on the control of HSC expansion.

Herein we focused on the non-haematopoietic (Ter119-CD45-) stromal FL compartment and showed that CD54+CD31- cells at embryonic day (E)14.5 hold a transcriptome typical of hepatic progenitors/hepatoblasts (Afp, Alb) and display key haematopoietic cytokine transcripts for angiopoietin, thrombopoietin, Cxcl12 and Scf. However, a sharp decrease observed on the expression of hepatoblast and hepatocyte markers (Afp, Alb, Ttr, AldoB), and haematopoietic cytokines following *in vitro* culture indicate a need for conditions that better emulate the native tissue. Analysis of genes putatively involved on the interaction of the CD54+CD31- cells with their natural FL extracellular matrix was performed to guide a future selection of culture substrates optimal for hepatoblasts. Interestingly, hepatoblasts display higher transcript levels of Fibronectin and Vitronectin as compared to all other non-haematopoietic cells in the FL. In parallel, optimisation of a protocol for multi-colour image acquisition (up to 8 colours) of thick tissue sections of up to 200 µm was launched to interrogate the spatial inter-relationship the haematopoietic supportive cell subsets keep with the other populations. Overall, this study is expected to unravel cues unique to the anatomical site and time, i.e. the developing hepatic organ, that drive the expansion of the future adult haematopoietic system.

- **15227 | Synergy of Sentinel-3 Radar Altimeter and OLCI for detection of internal waves (algorithm development)**

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Internal waves (IWs) of tidal frequency (i.e., internal tides) are successfully detected in sea surface height (SSH) by satellite altimetry. Shorter period internal solitary waves (ISWs), whose periods (and spatial scales) are an order of magnitude smaller than tidal internal waves, have been generally assumed too small to be detected with conventional altimeters. This is because conventional (pulse-limited) radar altimeter footprints are somewhat larger than the typical wavelengths of the ISWs.

Santos-Ferreira et al. (2018) demonstrate that the synthetic aperture radar altimeter (SRAL), which is a Delay-Doppler altimeter on board the Sentinel-3A and 3B, can detect short-period ISWs. A variety of signatures owing to the surface manifestations of the ISWs are apparent in the SRAL Level-2 products over the ocean, such as radar backscatter (σ_0), sea level anomaly (SLA), and significant wave height (SWH). The ISW signatures are unambiguously identified in the SRAL because of the exact synergy with OLCI (Ocean Land Colour Imager) images, which in cloud-free conditions allow clear identification of the ISWs in the sunglint OLCI images.

Here, the parameter "differenced mean square slope" (mss) is calculated from σ_0 and provides a method to automatically detect ISWs. This is a significant improvement from previous observations recently reported for conventional pulse-limited altimeters (such as Jason-2 and Jason-3; Magalhaes and da Silva, 2017).

Several case studies of ISW signatures are interpreted, and the developed Matlab code is ready to be used in any region of the ocean. Wavelets were used for a first analysis of the mss variations because ISWs can be readily identified in high frequencies signal. Other geophysical parameters such as SLA are used to exclude phenomena that are unlikely to be ISWs. Furthermore, the algorithm can be easily modified to detect other high frequency upper ocean processes, such as surface film slicks and sharp ocean fronts.

- **15232 | Isolation and characterization of biotechnologically and environmentally relevant strains of cyanobacteria**

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The isolation and characterization of strains of cyanobacteria and their availability in culture collections, as well as all associated information, are nowadays of great importance for the pursuit of research activities in the biotechnology area, such as the discovery of new compounds natural products; and environmental, such as in the evaluation of possible problems and risks for the environment as well as for humans due to the presence of cyanobacteria in certain biotopes.

This work, which has an exploratory character, is divided into two chapters. In the first chapter, new isolates of cyanobacteria from a biogeography and some habitats different from those represented in the Blue Biotechnology and Ecotoxicology (LEGE-CC) collection of cultures was studied and obtained. In addition, the diversity obtained was analyzed and its potential for the synthesis of potentially bioactive secondary compounds was characterized. In the second chapter, the potential of a variety of LEGE-CC cyanobacterial strains, including the isolates obtained in the first chapter, for the production of odoriferous compounds - geosmin and 2-methylisoborneol (MIB) was studied. Moreover, the efficacy of the molecular tools currently available for the detection of genes involved in the synthesis of these compounds was tested. The development of methods for the early detection of odoriferous compound producers is essential for the monitoring of surface water and /or water treatment systems, which aim to eradicate the occurrence of episodes of odor and taste that cause the degradation of water quality for human consumption. This is a scientific line that has emerged recently, still relatively unexplored, however in strong expansion.

Key-words: LEGE-CC, cyanobacteria, isolates, diversity, geosmin, MIB, PCR, primers, water quality

- **15236 | Antibiotic Resistant Bacteria in Bovine Meat**

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Since 2006, European countries cannot use antibiotics as growth promoters in animals. Nevertheless, they can be used to treat infections, just like in humans and for prophylactic use. The use of these drugs can lead to the development of antibiotic resistant bacteria. These can then thrive in the guts of animals, leading not only to contamination of meat at slaughterhouses but also to dissemination in the environment.

The aim of this exploratory ongoing work is to detect and identify antibiotic resistant bacteria in bovine meat with different types of packaging, different cuts and origins, with particular focus on extended spectrum beta lactamase (ESBL) producers and carbapenem resistance. To achieve this, beef samples were inoculated in a Gram negative selective medium with and without antibiotics. Antibiotic susceptibility tests by agar diffusion were performed under EUCAST guidelines with β -lactams and fluoroquinolones. Identification of the species/genera was performed presumptively, using CHROmagar Orientation medium and biochemical assays.

Results show that there is a presence of at least ampicillin and cefotaxime resistant bacteria in the majority of the samples and resistance to different antibiotics in other samples. Moreover, in the particular case of minced meat, it was observed the presence of resistant bacteria even in meropenem supplemented medium, suggesting possible cross contamination with other meats or poor hygienization of the meat grinder. Further work comprising the analysis of additional samples and the identification of resistance genes must be performed in order to obtain conclusive results.

- **15245 | Spread of antibiotic resistance in domiciliary care**

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Extensive antibiotic use over the years has led to the emergence and spread of antibiotic resistant bacteria. This resistance poses a major threat to public health. Hospitals and other healthcare settings are focal points for resistant bacteria spread.

The aim of this work was to detect and identify multidrug resistant bacteria in hands of domiciliary care providers. Sterile gauzes impregnated with culture broth were used for collection of bacterial contaminants in nails of providers of domiciliary care. This broth impregnated gauze was incubated at 37°C overnight in adequate culture media. Incubated broth suspension was spread on Mannitol salt agar, MacConkey agar and MacConkey agar with ampicillin, cefotaxime, ciprofloxacin and meropenem (2mg/L). Colonies were randomly selected to perform susceptibility tests, using agar diffusion method, according to The European Committee on Antimicrobial Susceptibility Testing (EUCAST). Chromagar Orientation, ID 32 GN and biochemical tests were used to perform presumptive and confirmatory bacterial identification.

Isolates presenting relevant resistance to the antibiotics tested were studied. All isolates were resistant to β -lactam antibiotics and three presented resistance to quinolones (ciprofloxacin).

These results show that different care settings might be focal points of dissemination of bacteria resistant to antibiotics including domiciliary care. To prevent dissemination is very important adequate hand hygiene and effective infection control practices in community elder and health-care providing.

- **15250 | Green roofs implementation and assessment in coastal areas**

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During the last century, an increase in the urban:rural population ratio has occurred, being a tendency that is expected to continue in the upcoming years. In order to counter some of the negative impacts of rapid urbanization as loss of biodiversity, floods, greenhouse gases emission and others, green roofs have been implemented. They offer economic, environmental and social advantages such: reduction of roof storm-water runoff, thermal buffering, sound insulation and addition of aesthetic value to buildings, mitigation of urban heat and solar radiation, improvement of water and air quality and promotion of biodiversity through connection and creation of habitats.

The aim of the present study is to assess the performance and resilience of three different autochthonous drought-tolerant plants (*Helichrysum italicum* subsp. *picardi*, *Corema album* and *Ammophila arenaria*) in pilot green roofs, implemented on a building in the coast line, being subject to extreme climate events. The green roof pilot systems were designed with plants, commercial substrate (Landlab), a filter membrane and a GUL-Green Urban living board (cork agglomerate working as a water retention and drainage layer). Three replicates were set for each specie monoculture, polyculture (with all species) and the control (without plants).

The pilot systems are being monitored concerning the associated soil biota through pitfall traps, analysis of the microbiota along seasons through molecular biology tools, water quality evaluation through analysis of nutrients, chemical oxygen demand, conductivity and pH and climate conditions are being registered with a data logger.

Although there is increasing knowledge regarding green roofs, more research is needed to select suitable and more ecological constituents, for each location and building type. The intention is to improve green roof functionalities, longevity, and effectiveness to promote better, and more resilient, urban environments.

- **15252 | Synthesis of carboxyxanthenes as suitable building blocks to obtain bioactive derivatives and chiral stationary phases**

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Xanthenes (9H-xanthen-9-ones) are heterocyclic oxygenated compounds composed by a dibenzo- γ -pirone scaffold with particular interest in Medicinal Chemistry [1]. Several substituents can be bound to this scaffold, including methyl, methoxy, carboxylic acid groups, among others, being responsible for different chemical properties [2]. Moreover, depending on the nature and position of those substituents, xanthone derivatives may present diverse biological and pharmacological activities [1]. In the last few years, our research group has been interesting in synthesis of carboxyxanthenes as building blocks in order to obtain other bioactive derivatives [3,4] as well as for development of chiral stationary phases for liquid chromatography [5]. Herein, the synthetic pathway to obtain different carboxyxanthenes are described.

Acknowledgements

This research was developed under the projects PTDC/ MAR-BIO/4694/2014 and PTDC/AAG-TEC/0739/2014 supported through national funds provided by FCT/MCTES, PIDDAC and ERDF through the COMPETE – POFC programme (POCI-01-0145-FEDER-016790 and POCI-01-0145-FEDER-016793) and RIDTI, Project 3599 and 9471, in the framework of the programme PT2020, as well as Project No. POCI-01-0145-FEDER-028736, co-financed by COMPETE 2020, Portugal 2020 and the European Union through the ERDF, and by FCT through national funds, and CHIRALXANT-CESPU-2018.

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- **15254 | Coffee by-products as sources of bioactive compounds**

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Coffee is one of the most well-known and consumed beverages all over the world. During post-harvest processing, roasting and brew preparation, a huge amount of coffee wastes is generated. According to the type of coffee processing, different by-products can be obtained, such as coffee husks (from dry method) or coffee pulp and parchment (from wet method), and immature and defective coffee beans. During roasting, coffee silverskin is detached from the beans, and after beverage preparation, or instant coffee production, huge amounts of spent coffee grounds are also obtained [1,2].

Coffee by-products are considered an environmental issue due to their content in caffeine and phenolic compounds, which in high amounts are antinutrients and phytotoxic, narrowing a direct use in feed or soil, respectively. With the emergence of renewable policies, a sustainable use of coffee by-products is expected, since those bioactive compounds can be extracted and used for several purposes [2].

This review describes the steps involved in coffee processing and the respective generation of by-products along the chain. Their chemical composition is detailed as well as methods for a sustainable management and potential applications. Indeed, coffee by-products can be a sustainable source of several bioactive compounds, thereby reducing their toxic effects on the environment.

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Acknowledgements: The authors thank the financial support to the project Operação NORTE-01-0145-FEDER-000011 and by the project UID/QUI/50006/2013-POCI/01/0145/FEDER/007265 (financial support from FCT/MEC through national funds and co-financed by FEDER) and by the project 033351-POCI/01/0247/FEDER/033351 (financed by FEDER).

- **15256 | BIODEGRADATION OF THE WIDELY PRESCRIBED FLUORINATED PHARMACEUTICAL ATORVASTATIN**

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The worldwide use of pharmaceuticals in human and veterinary medicine is of growing concern, as tons of pharmaceuticals are produced and consumed annually. Many of these drugs find their way into the environment through different routes, causing ecological disturbances and potential consequences to human health.

Atorvastatin (ATO), a cholesterol lowering agent mainly known by its trade name Lipitor, is one of the top ten most sold drugs in the world. Due to its high use, this pharmaceutical has been detected as a contaminant of natural waters and wastewater effluents. Once in the environment, ATO is expected to be resistant to most degradation mechanisms, mainly due to the presence of a fluorine atom in the molecule which renders it more stable and recalcitrant. This work aimed to investigate the role of bacteria in the biodegradation of ATO. For this, two bacterial consortia previously enriched with fluorinated drugs, enrofloxacin (ENR) and paroxetine (PRX), were used as inocula to investigate their capacity to biodegrade ATO. Biodegradation of ATO (3 mgL⁻¹) was investigated in aerobic conditions, in static mode, and in cometabolism with sodium acetate (500 mgL⁻¹). Biodegradation was followed by monitoring bacterial growth by spectrophotometry and the release of fluoride by potentiometry, on a weekly basis.

Results so far obtained have shown that both of the tested consortia have a capacity to biodegrade ATO, but the bacterial consortium enriched with PRX seems to have a more promising performance as it was capable of defluorinating ca. 50% of ATO in 21 days. Future work will focus on this consortium and will include new biodegradation studies with other bacterial cultures currently available at CIIMAR that were enriched with different fluorinated substrates.

- **15259 | Mitochondrial Dynamics in Thyroid Cancer: Unravelling the Role of DRP1**

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The Warburg effect is common in cancer cells, that rely mostly on glycolysis, rather than on oxidative metabolism. Changes in mitochondrial shape and activity also occur. Mitochondrial morphology is in a dynamic balance between fusion and fission. Our group showed an increase in the expression of mitochondrial dynamic related proteins in thyroid cancer, including dynamin-related protein 1 (DRP1), responsible for mitochondrial fission.

In thyroid cancer, MAPK signalling is frequently activated. It was described that BRAF (one of the main proteins of this signalling pathway) was related with a higher expression of DRP1 - suggesting a synergistic effect of both pathways.

We aim to assess the functional relevance of DRP1 and to understand the interplay between mitochondrial fission and MAPK signalling, in thyroid cancer.

The effect of DRP1 inhibition -Mdivi-1 (mitochondrial division 1 inhibitor)- and MAPK inhibition -Dabrafenib (BRAF inhibitor)- alone or in combination in cell viability and apoptosis in two thyroid cancer cell lines (TPC1 and C643), were evaluated by Presto Blue assay and by Annexin V/Propidium Iodine (PI) staining and flow cytometry, respectively.

Our results show a reduction in cell viability in a dose-dependent manner in both cell lines after treatment. Within the range of concentrations used, Mdivi-1 seems to have a higher effect in cell viability than Dabrafenib. We observed induction of apoptosis (more accentuated in C643 cell line), but the therapeutic combination does not appear to have synergistic effects.

We will next address the effects of these drugs in cell cycle (PI staining) and in mitochondrial reactive oxygen species production (MITOSOX staining). Lately, we will perform DRP1 silencing to confirm its importance in cancer cell viability.

- **15261 | *Cyanobium* sp. extracts – a potential source of natural antioxidants**

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Cyanobacteria are a group of photosynthetic prokaryote organisms with great diversity in habitat distribution, morphology and physiology. Several industries - pharmaceutical, cosmetic, food and feed among others, have been showing interest in these microorganisms due to their ability to synthesize multiple high value compounds with several bioactivities, such as antioxidant capacity. Oxidative stress is caused by several reactive oxygen species from endogenous or exogenous origin that may be associated to the development of several human neurodegenerative and inflammatory diseases or even cancer. Although there are actually synthetic produced antioxidants available, these have been associated with harmful side effects, so cyanobacteria have come up as solution since they can be a source for natural antioxidants. This study aims to exploit the potential of an autochthonous cyanobacteria in terms of its antioxidant capacity. For that, several extracts of *Cyanobium* sp. LEGE 06113 were obtained and evaluated. Bead beater assisted solvent extractions were made, using various solvents with different polarities in order to extract different groups of compounds. Seven extracts were obtained using acetone (A), dichloromethane:methanol (2:1, v/v) (DM) ethanol (E), ethyl acetate (EA), ethanol:water (1:1, v/v) (EW), hexane:isopropanol (3:2, v/v) (HI) and water (W). Four more extracts were obtained by successive extractions: three with water using the remaining biomass from the first extracts of EA, HI and A (EA>W, HI>W, A>W); a fourth ethanolic one was obtained using the remaining biomass of the former successive A>W extraction (A>W>E). The antioxidant capacity of all the extracts was then assessed by ABTS, DPPH, ORAC, -NO₂ and O₂ o- assays. This Portuguese strain showed an interesting biotechnological potential since the results of the assays revealed a high antioxidant capacity, particularly the E, EA HI, W and A>W>E extracts.

- **15262 | New anti-inflammatory drugs: novel or old effects on membrane lipids?**

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The efficacy of nonsteroidal anti-inflammatory drugs (NSAIDs) against inflammation, pain, and fever explains their worldwide use in the treatment of inflammatory conditions. However, the long-term therapy with NSAIDs is associated with a high incidence of adverse effects. This fact led to a long journey in the search for novel anti-inflammatory drugs with improved tolerability. One of the main strategies to improve NSAIDs safety comprises the modification of existing NSAIDs to release *in vivo* protective mediators, such as nitric oxide (NO) and hydrogen sulfide (H₂S) (1).

Since the therapeutic and toxic effects of NSAIDs are related to their effects on membrane lipids (2), this project aims to evaluate the effect of novel NSAIDs, namely H₂S-diclofenac, and the corresponding parent NSAID (diclofenac) on membrane lipids to give insights into the membrane interactions and pharmacological mechanisms of the novel drugs. Langmuir monolayers made of 1,2-dipalmitoyl-*sn*-glycero-3-phosphocholine (DPPC) were used as membrane mimetic systems. The interactions of drugs with membrane lipids were evaluated using surface pressure-area isotherms, Brewster angle microscopy and grazing incidence X-ray diffraction.

Differential effects of diclofenac and H₂S-diclofenac on the organization of membrane lipids were found, suggesting that both drugs may alter the structure of biological membranes *in vivo*.

This project is another step toward the enlightenment of the membrane lipid-related pharmacological actions of NSAIDs, and the prediction of novel drugs ability to induce toxicity *in vivo*.

Acknowledgements: This work received financial support from EU (POCI/01/0145/FEDER/007265), FCT/MEC (UID/QUI/50006/2013), FCT (IF/00293/2015) and Operação NORTE-01-0145-FEDER-00011.

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- **15264 | Phase transformation diagram determination for the 25Cr-7Mo-Ni-N Super Duplex Stainless Steel**

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Duplex stainless steels (DSS) are advanced materials with remarkable properties due to the chemical composition in conjunction with the bi-phasic microstructure, consisting of ferrite (δ) and austenite (γ) in approximately equal proportions. Comparing to other families of stainless steels, DSS exhibit higher mechanical strength and higher corrosion resistance, in particular to pitting and crevice mechanisms. This material features various forms of use, including tanks reserving corrosive liquid and automobile components. During the cast processing, the material is subjected to several heating/cooling cycles, resulting the formation of undesirable intermetallic phases, such as sigma (σ) and chi (χ) phases, these phases are detrimental to performance because they affect significantly the corrosion resistance and the toughness of the material.

From the industrial practice perspective, continuous cooling transformation (CCT) diagrams are very important tools that can be used to predict the microstructures, depending on the cooling rate. Moreover, CCT diagrams enable to establish the most suitable cooling condition to avoid the formation of intermetallic phases. So, the main purpose of this work is the experimental determination of a CCT diagram for the 25Cr-7Mo-Ni-N SDSS. In this regard, thermal cycles will be carried out at several cooling rates, ranging from 0,05 °C/s to 1 °C/s. The results of microscopic analysis show that the duplex microstructure composed of δ and γ is disrupted at the slowest cooling rates by the formation of intermetallic phases. These intermetallic phases (σ and χ) are not differentiated from each other in the microscopic examination, so they have been quantified together. It was also verified that the amount of γ is not affected by the cooling rate, while δ undergoes transformation into intermetallic phases at the slowest cooling rates.

- **15265 | Functional coating for industrial cork applications**

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Cork is increasingly used as a flooring in homes, whether on pavements or on walls. When using cork in civil construction, it is common to protect it with paints and varnishes. Thus, the goal of this work was to develop a water-based paint system that can be applied directly to cork sheets. The main studied properties were the tannin blocking performance, gluing strength to a PVC sheet and the tackiness. The project may be divided on five main phases: 1) solvent characterization, 2) resins characterization, 3) anti-tannins additives selection, 4) filler/extender selection and 5) overall assessment of the results and reformulation in order to successfully achieve the set goal.

The solvent characterization was performed using two tests, the solubility of tannin in a co-solvent and in water at different pH values. Nine co-solvents were selected, and the best results were obtained with ester alcohol, butyl diglycol acetate and dipropylene glycol, which could be used in the subsequent formulation and tested for binders, anti-tannin agent and extenders. Resins based on a cationic acrylate copolymer and on a copolymer dispersion based on vinyl acetate showed appropriate properties.

The formulation, composed by the solvent butyl diglycol acetate, the resin vinyl acetate, a topcoat, the anti-tannin agent zinc oxide and the copolymer dispersion based on vinyl acetate as filler, was the best one to attain the proposed goals i.e. good adhesion to PVC, less tackiness, adhesion to cork, blocking action to tannins migration and good stability in climatic chamber tests. The developed formulation has high interest for cork sheets protection.

Acknowledgements:

The support of the Barbot - Industria de tintas, SA company.

- **15266 | Is there a role for membrane lipids on drug-induced cardiovascular toxicity?**

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Nonsteroidal anti-inflammatory drugs (NSAIDs) are widely used due to their effectiveness in the treatment of acute and chronic inflammatory conditions. In spite of their efficacy, they are associated with high incidence of adverse effects as cardiovascular (CV) toxicity, which is particularly challenging for patients with high CV risk (1). In this sense, it is important to understand the molecular mechanisms underlying CV toxicity.

As CV diseases seem to be related to alterations in membrane structure and composition (2,3), the aim of this study is to characterize the interactions between NSAIDs and membrane lipids. Various anti-inflammatory drugs were studied, namely rofecoxib and diclofenac (high CV risk), naproxen (low CV risk) and quercetin (cardioprotective). Liposomes made of 1-palmitoyl-2-oleoyl-glycero-3-phosphocholine (POPC) and POPC:cholesterol (4:1) were chosen as membrane model systems. The drug-membrane interactions were studied by determining the drugs' stability and affinity for the membrane and the drugs' effect on the membrane permeability and fluidity, using derivative spectrophotometry and fluorometric assays, respectively.

The stability and the affinity of drugs for the membrane models, as well as their effects on membrane permeability and fluidity were dependent on diverse factors, namely molecular structure and ionization state of the drug, and composition of the membrane model.

Ultimately, this project aims at gaining insights into a possible correlation between drug effects on lipid bilayers and drug-induced CV toxicity.

Acknowledgements: This work received financial support from EU (POCI/01/0145/FEDER/007265), FCT/MEC (UID/QUI/50006/2013), FCT (IF/00293/2015) and Operação NORTE-01-0145-FEDER-00011.

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- **15268 | A multi-target approach towards diabetes based on the metabolic versatility of *Diospyros* spp. from Thailand**

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An overview on the therapeutic arsenal evidences that medicinal plants constitute the major source of lead therapeutic agents. Despite the number of studies on the therapeutic properties of Asian plants, reports on the Thai flora are still scarce. As such, with the current work we aimed to identify new sources of antidiabetic agents, profiting from the metabolic versatility of Thai *Diospyros* spp. Extracts obtained from the leaves of *D. mollis* and *D. decandra* were chemically characterized and assessed for their ability to interfere with biological events associated with diabetes. Phenolic profiling evidenced that the aqueous extract obtained from the leaves of *D. decandra* was mainly characterized by a series of caffeoylquinic acids, while the methanolic extract obtained from the leaves of *D. mollis* was found to be rich in catechin derivatives. Antidiabetic properties were evaluated through the interference with the activity of carbohydrate-absorption enzymes. Concentration-dependent inhibitory effects upon α -glucosidase were noted, the extracts obtained from the leaves of *D. decandra* and *D. mollis* exhibiting IC₅₀ values of 86.5 and 22.3 μ g mL⁻¹, respectively, evidencing a stronger inhibitory effect than that observed with the reference antidiabetic drug acarbose (IC₅₀ = 106.65 μ g mL⁻¹). Concerning the effects towards α -amylase, while *D. decandra* leaves extracts was unable to interfere with its enzymatic activity, the extract obtained from the leaves of *D. mollis* was found to significantly inhibit the enzyme ($p < 0.05$) at the highest concentration tested (500 μ g mL⁻¹).

This work received financial support through the project UID/QUI/50006/2013, from NORTE 2020, under the PORTUGAL 2020 Partnership Agreement, through the European Regional Development Fund (NORTE-01-0145-FEDER-000024), and from Programa de Cooperación Interreg V-A España – Portugal (POCTEP) 2014–2020 (project 0377_IBERPHENOL_6_E)

- **15270 | Response of denitrifying microorganisms to the increase of copper nanoparticles: case study of the Douro Estuary**

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The increased use of nanoparticles in many industrial applications has led to their accumulation in the environment. Sediments can adsorb nanoparticles and act as a sink or source of contaminants to the water column, and metal speciation determines bioavailability and toxicity of metals to the biota. Denitrifying microorganisms can perform the complete reduction of nitrate to molecular nitrogen under anoxic conditions playing an important role in the loss of fixed nitrogen in the nitrogen enriched environments. This work will characterize interactions of copper nanoparticles (Cu-NPs) with estuarine sediments from Douro River, namely to determine if their deposition in sediments can introduce metals into the environment that impact denitrifying communities. For this purpose, microcosm experiments will be carried out with intertidal sediments incubated with three concentrations (0.01, 0.1 and 1 mg/L) and sizes (<50, <100 and <150 nm) of Cu-NPs in triplicate. The response of microbial communities to Cu-NPs will be accomplished by studying the prokaryotic profile based on the next-generation sequencing of the 16S rRNA gene (V4-V5 regions) and denitrification pathways will be quantified by targeting cytochrome cd1-containing reductase (nirS) and copper-containing reductase (nirK) encoding genes and transcripts by real-time PCR. The effect of different Cu-NPs sizes and concentrations on denitrification pathway in the Douro Estuary microbial communities will be presented.

- **15272 | Impact of Cannabis tetrahydrocannabinol on aromatase and estrogen receptor expression by placental cells**

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The development of placenta is dependent on tightly regulated processes of proliferation, differentiation and apoptosis of trophoblasts. These cells are also responsible for placental endocrine function. Delta9-Tetrahydrocannabinol (THC) is a phytocannabinoid, found in Cannabis sativa, the most commonly used illicit drug among pregnant women. THC is able to cross the placental barrier and it may lead to intrauterine growth restriction, preterm labour and miscarriage that are gestational alterations associated with cannabis consumption during pregnancy. However, the biochemical mechanisms underlying the impact of THC on the endocrine function of trophoblasts and placenta are unknown.

This study aims to investigate the effects of THC on estrogen production in placenta by using the trophoblastic Bewo cell line (ATCC, USA). For this, cells were treated with THC (10, 20 and 40 μ M) for 24 h. Gene expression for the enzyme involved in estrogen biosynthesis (CYP19A1 that codifies aromatase) and for estrogen receptor-alpha and -beta (ER- α and ER- β) were evaluated through qPCR. The protein expression levels of aromatase and ER- α and ER- β were assessed by Western Blot.

After 24 h of treatment, both mRNA and protein levels of aromatase and estrogen receptors were significantly increased for the highest concentrations of THC. These results suggest that THC may alter estrogen signalling and trophoblast endocrine function, which may affect normal placental development and pregnancy outcome. Moreover, these results may contribute to disclose the biochemical and cellular effects of cannabis-derived drugs.

Work financed by FEDER through COMPETE and FCT through PTDC/DTP-FTO/5651/2014-POCI-01-0145-FEDER-016562; FCT/MEC and FEDER, under PT2020 (UID/01/0145/FERDER/007728) and CCDR-N/NORTE2020/Portugal 2020 (norte-01-0145-FEDER-000024).

- **15273 | Floating wetland islands to promote water quality enhancement**

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A Floating Wetland Island (FWI) is a phytoremediation technology that intends to mimic natural processes for water quality enhancement, promotion of biodiversity and ecosystem rehabilitation. It has been tested in multiple contexts as the remediation of eutrophic lakes and stormwater, presenting notable results in reducing nutrients and even removal of other types of pollutants. However, knowledge associated to their ability for contaminant removal is still scarce and more research is needed to support this ecotechnology.

The present study final goal is to investigate the application of FWI to promote water quality enhancement in port marina environments, a harsh environment due to water salinity. To our knowledge, this has not yet been explored, being an important issue to address. Having that in consideration, a pilot FWI was implemented in the marina of the Porto Cruise Terminal in Matosinhos. The pilot system (1.5×1.0 m) was assembled with three interconnected floating modules of agglomerated cork (Cork Floating Island®, provided by the company Bluemater), and planted with several plant species: *Sarcocorniasp.*, *Juncus sp.*, *Halimione sp.* and *Phragmites sp.* The first step of this study involves the implementation of the FWI and the assessment of the biotic communities that will be established in the cork floating modules. At this moment, mapping of the biotic communities associated to this pilot FWI has been carried out to understand their dynamics along time and possible relation to water depuration processes. Microscopy and molecular biology tools have been used. Further on, several water quality parameters such as nutrients, chemical oxygen demand, salinity and pH were also determined. Obtained results will be presented.

- 15286 | Investigating the role of CD44v6 as a modulator of chemotherapy response in gastric cancer cells

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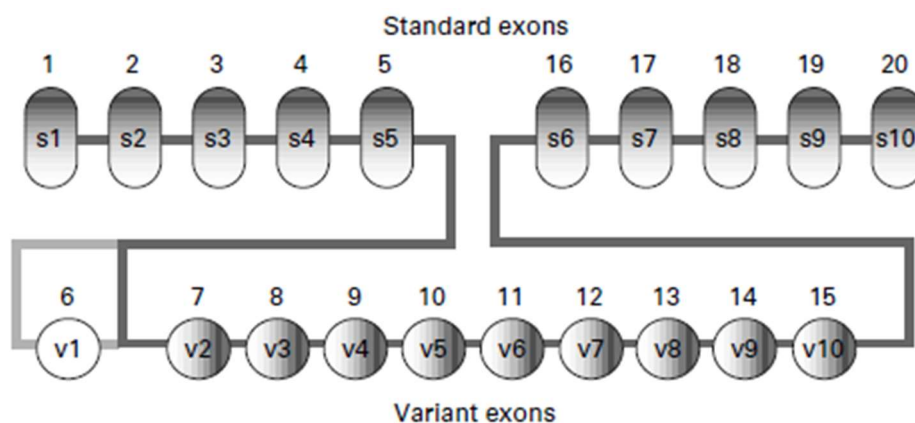
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Gastric cancer (GC) is the 5th most common cancer and the 3rd leading cancer related cause of death. Most GC patients are diagnosed at advanced stages of disease, being chemotherapy the treatment of choice, with an overall survival of ~1 year, even when targeted therapies are used. Therefore, it is important to improve treatment of GC patients.

CD44 is a major cell surface adhesion protein, encoded by one gene that undergoes intensive alternative splicing, resulting in different transcripts. CD44 standard is constituted by the constant part of the gene and is found in most epithelial cells. CD44v6 is an isoform only expressed in specific epithelia and has been associated with certain types of cancer, including GC, regarding tumor invasion, progression and metastasis. In addition, previous work from our group indicated that CD44v6 may be involved in resistance to chemotherapy in GC cells. Hence, we aim to explore CD44v6 as a modulator of therapy response in GC.

To address our main goal, we are generating GC cells without CD44v6 expression, either through CRISPR-Cas9 system or Morpholino Antisense Oligonucleotides (MSO), from GC cell lines that endogenously express CD44v6. CRISPR-Cas9 genome editing is a powerful tool that allows precise DNA double-strand breaks through Cas9 nucleases. We are permanently deleting exon V6 by targeting the flanking introns to create a different protein. MSO are constructs of nucleic acids complementary to mRNA target enabling splicing modulation through ligation of MSO to splice sites, blocking their recognition by the spliceosome, skipping the target region. In this project, we are testing two MSO at 5' and 3' splice sites of exon V6 to induce exon skipping.

Ultimately, upon establishing GC cell lines without exon V6, we aim to understand how modulation of CD44v6 expression influences response to chemotherapeutic agents. This work is currently ongoing and its preliminary results are presented here.



Schematic diagram of CD44 gene structure. Goodison S. et al., Mol Pathol (1999)

- **15287 | Functionalization of cotton with TiO₂-based Nanostructured Materials 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, deodorants, sterilizing and self-cleaning agents (1). Following UV-photoexcitation, the TiO₂ photocatalyst generates an electron-hole pair, that leads to reactions with O₂ and H₂O molecules that create superoxide and hydroxyl radicals (2). 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 and more practical alternative to the impregnation methods used in the textile industry, such as dip-pad-dry-cure processes (2). The use of this NPs in organic cellulose is even more prosperous because porous coating materials may resist to rinsing (3). Furthermore, a parallel comparison between SiO₂@TiO₂ core-shell particles, anchored on cotton substrates, and TiO₂-Cotton, prepared by a hydrothermal route, will be established, regarding its photocatalytic, structural and morphological properties. The hydrothermal methodology follows a sol-gel technique, using titanium butoxide (Ti(OBu)₄) as the precursor, and enables the growth and nucleation of the NPs at lower temperatures, through an 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. Additionally, the photocatalytic activity of this system towards the photodegradation of Rhodamine B has also been addressed.

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- **15288 | Adenosine deaminase activity is inversely correlated with inflammatory parameters and prognostic score in patients with cardiogenic shock**

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Introduction: Adenosine is cardioprotective and an important regulator of inflammation. Adenosine deaminase (ADA) regulates adenosine concentration by catalyzing its deamination to inosine. Although inflammation contributes to cardiovascular disease, the role of ADA has seldom been investigated in heart failure (HF). Aims: To evaluate ADA activity in acute HF (AHF) and cardiogenic shock (CS), as well as its correlations with inflammatory parameters, cardiac biomarkers and prognostic scores. Methods: This study was approved by the Health Ethics Committee of Centro Hospitalar São João, Porto. Patients with the diagnosis of AHF (n=13), CS (n=16) and non-cardiogenic shock (NCS) (n=9) were included and blood samples were collected. ADA activity, C-reactive protein (CRP), B-type natriuretic peptide, high-sensitivity troponin I (hs-trop I), creatine kinase MB isoenzyme, myoglobin and leukocyte count were evaluated using automated analyzers. APACHE II and SAPS II scores and neutrophil-to-lymphocyte ratios (NLR) were also calculated. Results: ADA activity did not differ between the groups. CRP (mg/L) was significantly higher in CS and NCS when compared to AHF values (AHF:47±14; CS:141±21; NCS:246±42; CS vs. AHF, p=0.02; NCS vs. AHF, p<0.001), but no differences were observed for NLR. Regarding cardiac biomarkers, significant differences were found only for hs-trop I and myoglobin in NCS when compared to CS (p=0.01) and AHF (p=0.01) groups, respectively. SAPS II, but not APACHE II, was significantly different between groups (p=0.04). ADA activity was inversely correlated with CRP (r=-0.72; p=0.02), NLR (r=-0.68; p=0.03) and APACHE II scores (r=-0.66; p=0.04) only in CS. No correlations were found between ADA activity and cardiac biomarkers. Conclusions: Although preliminary, these results suggest that lower ADA activity values are associated with higher inflammation and poorer prognosis in CS patients.

[Funded by FCT/FEDER (COMPETE, Portugal 2020), PTDC/MEC-CAR/32188/2017].

- **15291 | Chromosome instability in lymphocytes from patients treated with inhaled corticosteroids**

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Asthma is a chronic disease of the respiratory system, in which bronchial airways inflammation is the most prominent pathological feature. Inhaled corticosteroids have been used as the main treatment for asthma, due to the effect on the reduction of inflammation, swelling, and mucus production.

Since corticosteroids are so widely used in clinical practice, their possible side effects are a constant issue in biomedical research studies. The potential genotoxicity of these agents does not appear to affect individuals under normal physiological and therapeutic conditions. However, in extreme or chronic conditions, where oxidative stress (OS) is a main manifestation, genotoxicity may appear. Since the role of OS in the onset of chromosomal instability (CI) and, consequently, in cancer predisposition is well known, it is of great importance to carry out studies correlating clinical situation/treatment/genotoxic effect, in order to establish limits/prevention for harmful effects with carcinogenic potential.

The objective of this study was to evaluate the potential presence of CI in cells from patients treated with the corticosteroids most frequently used in clinical practice.

The study was performed on lymphocytes from individuals with asthma ($n = 5$) treated with the drug symbicort. For each individual the following cultures were performed: spontaneous, DEB-induced (a known clastogen) and DEB-induced with anti-oxidant treatment. A comparative in vitro study was performed using lymphocytes from normal subjects ($n = 10$) in order to study the effect of the drug independently from the disease. For each individual the following cultures were performed: spontaneous, DEB-induced, with symbicort (at therapeutic dose) and DEB-induced with symbicort.

The results showed a significant increase in CI associated with the presence of corticosteroids, which was significantly reduced when an antioxidant treatment was added. The possible clinical importance of these results is discussed.

- **15292 | Synthesis of Chiral Derivatives of Xanthenes with Potential Antimicrobial Activity**

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Xanthenes derivatives are being associated to relevant biological activities[1]. Many natural bioactive xanthone derivatives are chiral, while most of synthetic derivatives are not chiral or the stereochemistry is ignored. Chiral derivatives of xanthenes (CDX) of amino esters and amino acids have been pointed as potential antimicrobial agents due to the penetration of the xanthone hydrophobic scaffold in the microbial membrane, where the amphiphilic moiety, the amino ester or amino acid, interferes with the negative charges of the membrane, disrupting it and leading to the microbe death.[2]

In order to develop new CDX with potential antimicrobial agents, we synthesized a series of CDX using the 2-((9-oxo-9H-xanthen-3-yl)oxy)acetic acid (XCAR1) as chemical substrate and the coupling reagent (1-cyano-2-ethoxy-2-oxoethylideneaminoxy)dimethylamino-morpholinocarbenium hexafluorophosphate (COMU) to bond XCAR1 to a variety of commercial amino esters.[1] XCAR1 was synthesized with an overall yield of almost 60%. The reactions of XCAR1 to obtain the CDX were performed with yields higher than 50%. Afterwards, a hydrolyse reaction was carried out to obtain the amino acid CDX. The enantiomeric purity of the synthesized CDX was evaluated by liquid chromatography using a polysaccharides derivative chiral stationary phase.

Acknowledgements

This research was developed under the projects PTDC/ MAR-BIO/4694/2014 and PTDC/AAG-TEC/0739/2014 supported through national funds provided by FCT/MCTES, PIDDAC and ERDF through the COMPETE - POFC programme (POCI-01-0145-FEDER-016790 and POCI-01-0145-FEDER-016793) and RIDTI, Project 3599 and 9471, in the framework of the programme PT2020, as well as Project No. POCI-01-0145-FEDER-028736, co-financed by COMPETE 2020, Portugal 2020 and the European Union through the ERDF, and by FCT through national funds, and CHIRALXANT-CESPU-2018.

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- **15294 | The utility of multiplex ligation-dependent probe amplification analysis in congenital hypothyroidism**

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Congenital hypothyroidism (CH), defined as thyroid hormone deficiency, is the most common inborn endocrine disorder with a prevalence of 1 in 3000-4000 newborns and in 80-85% of the cases is due to thyroid dysgenesis. Although mostly sporadic, approximately 5% of these cases have a genetic origin with pathogenic variants in genes playing a role in thyroid morphogenesis such as PAX8, FOXE1, NKX2-1 and TSHR. The remaining cases (15-20%) are caused by thyroid dyshormonogenesis and characterized by enlargement of the gland (goiter). Inborn errors of thyroid hormonogenesis are commonly associated with an autosomal recessive form of inheritance and caused by mutations in genes coding proteins involved in thyroid hormone biosynthesis such as thyroid peroxidase (TPO). A mutation in TPO gene is associated with iodide organification defect.

Multiplex ligation-dependent probe amplification is a multiplex PCR method for abnormal copy number detection (CNV). The SALSA® MLPA® "Probemix P319 Thyroid" allows quantification of deletions or duplications in five CH related genes.

DNA samples of ninety-six children with CH diagnosis following neonatal screening were previously sequenced in order to identify variants in TPO gene. MLPA utility in CH molecular diagnosis will be determined based on the CNV analysis of cases in which TPO Sanger sequencing revealed the absence of pathogenic variants or the presence of only one potentially pathogenic variant.

A precise molecular diagnosis that includes copy number changes detection will expand TPO as well as other genes mutational spectrum and improve the genetic analysis for CH.

Funding:

UMIB is supported by National Funds through the FCT - Fundação para a Ciência e a Tecnologia (Portuguese national funding agency for science, research and technology) in the frameworks of the UID/Multi/0215/2016 project - Unit for Multidisciplinary Research in Biomedicine - UMIB/ICBAS/UP.

- **15295 | Preparation and characterization of films based on biopolymers**

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In recent years, there has been a decline in natural resources, as well as an increase in the negative impact that companies wastes have on the environment, which has led to the emergence of a "circular and sustainable economy". Within this theme, the objective of the present work is the use of components extracted from wastes or by-products of the fishery industry in order to explore its potential application in membrane synthesis for later use in areas such as optical sensors of heavy metals based on membranes of biopolymers.

The preparation of the membranes was based on the use of polysaccharides, such as chitosan, chondroitin sulfate and fucoidan, extracted from the wastes, of crustaceans, fish and brown seaweed, respectively.

Different membranes were synthesized based on two biopolymers, optimizing a synthesis already described in the literature and adapting it. [1] Biopolymers and siloxanes-based membranes were also synthesized, adjusting the already described method and recreating to other biopolymers. [2] Due to the flexible chemical structures of these biopolymers it was possible to use molecular imprinting of Pb^{2+} as an attempt to improve the selectivity and capacity of these membranes for this species (Figure 1).

The synthesized membranes were further characterized using different techniques such as FTIR, TGA, BET and its interactions with selected cations were evaluated.

Acknowledgment

This work was financed by the Pest-C./QUI/UI0081/2013 project (FEDER/COMPETE and Portuguese Foundation for Science and Technology (FCT)) and by Projeto CVMar+i, INTERREG V-A Espanha - Portugal (POCTEP) 2014-2020, nº de Exp. 0302_CVMAR_I_1_P.

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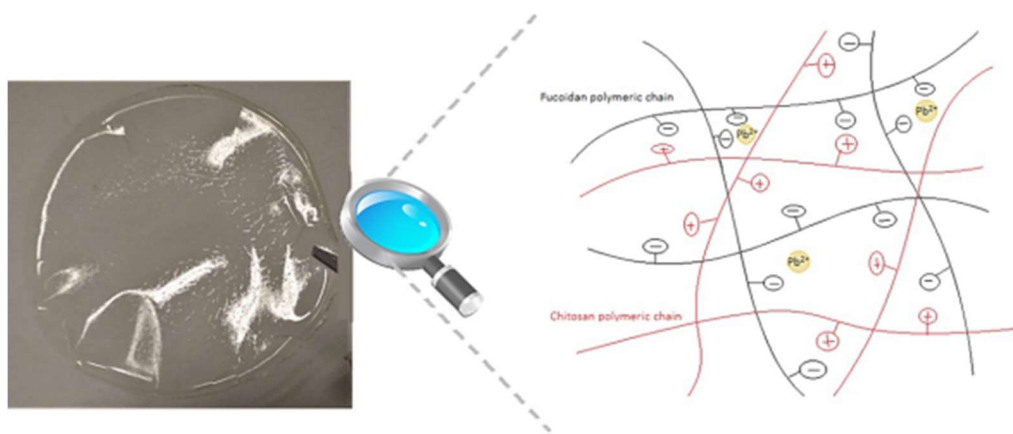


Figure 1 - Image of a membrane with the scheme of reticulation and example of interactions between biopolymer chains and metal cation.

- **15297 | Ecotoxicological evaluation of fungicides commonly used in viticulture in aquatic microorganisms**

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Fungicides are used intensively in modern agriculture in order to control pests and, consequently, plant diseases. The application of fungicides in the fields can lead their accumulation in the environment or the production of new molecules by their degradation that leach to the aquatic ecosystems. In these ecosystems, fungicides can dissolve freely in water or bind to suspended matter and sediments, which may interfere with non-target aquatic organisms becoming incorporated into food webs. The main objective of this study was to evaluate the toxicity of three fungicides (Myclobutanil, Cymoxanil and Azoxystrobin) on organisms from different trophic levels (e.g. bacteria and microalgae). These non-target organisms occur in natural water bodies, playing a key role in the base of the food web of aquatic ecosystems, but general data on fungicide toxicity is missing for this type of microorganisms. To achieve our objective, acute toxicity assays were carried out, with organisms from each species being exposed to ecological relevant concentrations of each fungicide. Endpoints such as cell viability, growth inhibition, mortality and physiological parameters were evaluated.

Keywords: Fungicides, Non-target organisms, Acute toxicity, Aquatic ecosystem, Standard species

- **15299 | Wheat as a potential allergenic food**

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Cereals have been part of human diet for more than 10,000 years, especially wheat. Nowadays, wheat is one of the most widely consumed cereals, being considered a very versatile food with several applications in industry. However, wheat is associated with 3 important health conditions and its presence in processed foods represents a public health risk. This work intends to review the potential applications of wheat in the food industry and its impact in human health.

Wheat belongs to the genus *Triticum*, which encompasses about 23 species, being the most relevant ones, the hexaploid (*T. aestivum* - common wheat, *T. spelta* - spelt) and tetraploid (*T. durum* - durum wheat) species. This cereal is widely used not only in bakery products (bread, cakes, cookies) and pasta, but also as an ingredient in several processed foods (meat products) mostly due to its technological proprieties. Conversely, wheat consumption has also been associated with celiac disease, hypersensitivity to wheat and wheat allergy, affecting a significant portion of the world's population. All these health conditions are related to the protein fraction of wheat, namely the gluten fraction (celiac disease and hypersensitivity to wheat) and more than 28 different proteins (wheat allergy). Therefore, in the attempt to safeguard the life of these patients, special focus has been devoted to the potential application of food processing technologies that might help reducing gluten content, such as deamidation of gliadins (hydrolysed wheat protein). With the same focus, different food processes have been used to mitigate the allergenic potential of wheat protein fraction. Still, much research is need to determine which technologies are more effective in reducing the allergenicity of wheat proteins.

- **15300 | EcoSan - promoting the integral ecological sanitation**

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The EcoSan project aims to promote the integral ecological sanitation model, based on solutions inspired by nature, namely "dry toilets" and "floating islands / constructed wetlands" and contribute to Environmental Education in the domains of territory valorization and circular economy, among several economic sectors, namely agriculture, industry and tourism. This will be accomplished through the promotion of programs, activities and campaigns of Environmental Education aimed at adopting more sustainable practices regarding the efficient use of water, with special focus on reducing consumption. It is also intended to contribute to an open, critical and reflexive dialogue on the actual environmental challenges, in particular the promotion of a new attitude towards the valorisation of water resources, as well as the creation of value, more sustainable environmental policies and practices, inducing the change of individual and collective behaviors.

Authors will present the methodology underlying the implementation of this project that encompasses, action-education activities, ideas competitions, training and capacity-building actions to promote the dissemination of knowledge, environmental awareness campaigns, preparation of teaching materials, practical digital guides, sustainability plans, conferences / seminars, activities of education-action and exhibitions.

- **15304 | *Escherichia coli* and *Klebsiella pneumoniae* from urinary and intestinal microbiota: friends or foes?**

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Background: *E. coli* (Ec) and *K. pneumoniae* (Kp) are frequently involved in human urinary infections, often with multidrug resistance patterns, being the intestinal and urinary microbiotas recognized sources of these bacteria. In this study we will assess their occurrence and diversity in intestinal/urinary microbiota of healthy people or patients with urinary disorders.

Materials/Methods: Urines (100 µL) from 20 healthy young women, patients with overactive bladder (n=7 OAB) or recurrent UTI (n=4 rUTI) and rectal swabs (200 µL) from 199 healthy individuals were processed in Blood/Chromogenic/Simmons citrate agar+1% inositol. All presumptive Ec/Kp from urines or Kp from rectal swabs (1-5 morphotypes/plate) were identified by MALDI-TOF MS and further characterized. Antibiotic susceptibility testing was performed by disk-diffusion (EUCAST). Isolates were characterized by Fourier-Transform Infrared (FT-IR) spectroscopy; PCR/wzi sequencing (Kp) and identification of phylogenetic groups(PhG)/ST131 by PCR (Ec).

Results: Twenty-two representative Ec were found in 4 healthy (PhG 3 B2, 3 F and 1 E), 2 OAB (4 B1, 4 B2) and 2 rUTI (7 B2) urine samples (26% occurrence), and all B2-*E. coli* (63.6%) were presumptive ST131. 2 Kp were isolated from 1 OAB/1 rUTI. Most of the isolates (Ec, Kp) were fully susceptible to antibiotics, and occasionally resistant to tetracycline (16.7%) or fluoroquinolones (8.3%). Among rectal swabs, eleven (5.5%) healthy people were colonized with 13 Kp, displaying resistance only to certain beta-lactams (54%). Diverse Kp from both sources carried infrequent (K8, K39, KL25, K31) or unknown K-types.

Conclusion: A high diversity of *E. coli* and *K. pneumoniae* were found as gastrointestinal or urine colonizers apparently different from those causing infections (antibiotic susceptible or different genetic backgrounds). Nevertheless, the identification of B2-ST131 is of highlight and reinforces the need to understand its role in the urinary microbiota.

- **15305 | Honey produced from plants containing pyrrolizidine alkaloids: quality control and safety**

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Honey is a nutritious food consumed worldwide, being recognized for its health-promoting properties. Its consumption is associated with a healthy diet, as it contains many beneficial bioactive compounds, including flavonoids and other polyphenols. However, some molecules with potentially harmful effects can also be found when using plants containing molecules such as pyrrolizidine alkaloids, which have been described as toxic. These alkaloids are distributed in plants throughout the world, frequently in species relevant for human and animal consumption, rendering their toxicity a concern. Therefore, Portuguese monofloral and multifloral honeys derived from *Echium plantagineum* L., a species known for its pyrrolizidine alkaloids, were analysed regarding the presence of these toxic molecules and phenolic compounds by HPLC-DAD. No pyrrolizidine alkaloid was detected, whereas phenolic compounds were found in low concentrations. The samples were also assessed for their potential anti-inflammatory activity (RAW 264.7 macrophages), cytotoxicity (AGS gastric adenocarcinoma cells) and safety (MRC-5 foetal lung human fibroblasts). In general, neither cytotoxic effect or appreciable biological activity were observed. Furthermore, the study of the potential anti-inflammatory activity of the alkaloid- and phenol-targeted extracts in a cellular model of RAW 264.7 revealed a decrease in nitric oxide radical production of *ca.* 30% and 40%, respectively. Additionally, the botanical origin of the samples was ascertained by the palynological analysis.

This work received financial support from Programa de Cooperacion Interreg V-A Espana - Portugal (POCTEP) 2014-2020 (project 0377_IBERPHENOL_6_E), through the European Regional Development Fund (ERDF).

- **15306 | 2,4-Dihydroxy-3-propilacetophenone derivatives as synthetic intermediates: synthesis and structure elucidation**

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o-Hydroxyacetophenones are widely used in the synthesis of pharmaceuticals, perfumes, flavors, fragrances, dyes, plastics, antioxidants, stabilizers, and fungicides. Moreover, these small molecules are important building blocks for the synthesis of diverse bioactive compounds, namely flavonoids, alkaloids and heterocyclic compounds 1. In this work, synthesis, purification, and structure elucidation of four derivatives of 2,4-dihydroxy-3-propilacetophenone (DHPA) are described (Scheme 1).

1-(2-Hydroxy-4-methoxy-3-propylphenyl)ethan-1-one (1) was synthesized by the methylation of DHPA with dimethyl sulphate with 90% yield 2. Acetylation of acetophenone 1 and DHPA performed by Friedel-Crafts acylation using $AlCl_3$ as Lewis acid gave acetophenone 2 and 3 with 81% and 10% yield, respectively 3. The synthetic approach used for the synthesis of acetophenone 4 was based on the reaction of DHPA with propargyl bromide in the presence of K_2CO_3 , in reflux in acetone 4. Acetophenone 1 and 2 were purified by crystallization with ethyl acetate and acetone, respectively. Compounds 3 and 4 (yield of 44%) were purified through flash chromatography and the structure elucidation was established using spectroscopic methods, namely, IR and ^1H and ^{13}C NMR.

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Acknowledgments: This research was supported by under the projects PTDC/MAR-BIO/4694/2014 (POCI-01-0145-FEDER-016790; Project 3599-PPCDT), PTDC/AAGTEC/0739/2014 (POCI-01-0145-FEDER-016793; Project 9471-PPCDT), and POCI-01-0145-FEDER-028736. Joana Moreira acknowledge for her grant (SFRH/BD/135852/2018).

- **15307 | Marine nature as a source for cancer therapy: xanthone loaded fucoidan/chitosan nanoparticles**

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Xanthenes are carbonyl compounds which consist of a 9-position oxidized xanthene heterocycle and which can be of natural or synthetic origin. Due to their large number of biological applications, they have been studied in the treatment of several diseases. Some studies have presented xanthenes as potential antineoplastic agents, in addition to their antioxidant potential, antimicrobial, among others. [1] However, the toxicity of xanthenes sometimes limits the administered dose, which motivates their application in nanoparticles, in order to control possible undesired side effects of these compounds in the human organism.

Marine polysaccharides, like fucoidan and chitosan, have been explored as nanoparticles to produce drug delivery systems, intending to improve effectiveness and safety of drug oral administration. [2]

In the present study, fucoidan (MW 50,000 - 190,000 Da) and chitosan (MW < 10,000 Da) were combined in order to prepare stimuli-responsive polymeric nanoparticles. These carriers empty and loaded with a xanthone were physicochemically characterized, in terms of size, polydispersity index, zeta potential, pH response and drug content. Evaluation of storage stability was also accessed.

The obtained results show promising future applications of these systems for the oral delivery of xanthenes.

Acknowledgments

This research was partially supported through national funds provided by FCT and European Regional Development Fund (ERDF) and COMPETE under the Partnership Agreement PT2020 UID/QUI/50006/2013-POCI/01/0145/FEDER/007265 and the projects PTDC/MAR-BIO/4694/2014, POCI-01-0145-FEDER-016790. AIB acknowledges her fellowship under project PTDC/MAR-BIO/4694/2014 and SCL thanks funding from FEDER-Operational Competitiveness and Internationalization Programme (COMPETE 2020) through project NORTE-01-0145-FEDER-000011.

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- **15309 | Metabolic requirements of human spermatozoa and their impact on sperm quality during storage**

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Infertility affects about 13-18% of the couples worldwide, in which the male factor is a cause in about half of the occurrences. However, in the majority of the cases the causes remain unknown and the usage of assisted reproduction techniques (ART) is mandatory. An important factor in ART is sperm quality. Hence, the development of experimental conditions which allow the maintenance of sperm-quality is fundamental. Among these, the establishment of the optimal metabolic conditions for human spermatozoa is a key feature.

It is known that mature spermatozoa present specific metabolic needs to accomplish their function: fertilize the oocyte. With this aim, sperm use external hexoses, such as glucose and fructose, as their main energy substrates, glycolysis enzymes are localised in the principal piece of the tail. Moreover, spermatozoa can obtain energy by phosphorylation oxidative localized in the mitochondria at the midpiece.

In this study, we aim to describe the impact of the exposure to specific metabolites (D-Glucose, D-Fructose, Docosahexaenoic Acid) on specific sperm quality parameters (viability and motility) and on sperm metabolism and bioenergetics. We evaluated sperm motility and viability following the WHO guidelines. We evaluated metabolite consumption and production by proton nuclear magnetic resonance spectroscopy and mitochondria bioenergetic by using standard fluorometry (JC-1).

Our results suggest that the metabolic content of the sperm storage media have a direct influence on sperm quality, modulating the usage of specific metabolic pathways in sperm and with a direct impact on mitochondria function. Further studies will be needed to explore the mechanisms by which these metabolites exert their effect on human spermatozoa helping us to improve ART extender media.

- **15310 | A new method towards the hatching of planktonic organisms from alpine ponds**

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Alpine ponds are natural waterbodies with short dimensions that appear at high altitudes. These freshwater habitats, characterized by extreme environmental conditions, are totally covered in ice during the unfavourable season. Therefore, the organisms of these ponds developed different life strategies like resistance structures that are fundamental to withstand environmental fluctuations. Indeed, there is still a lack of ecological studies in alpine ponds, with more evidence in Portuguese context. Due to this scarce of scientific information, this work attempted to develop an efficient method (adapted of methods for other types of waterbodies) to promote the hatching of resistance structures of planktonic organisms present in the sediments of Serra da Estrela alpine ponds. The collected sediments were frozen, and this thermal shock allowed to mimic the local environmental conditions of snowfall and ice formation during the winter. Three replicates of each sediment sample (pond) were incubated with desionized water in a chamber with regulated photoperiod and temperature, to simulate the environmental and natural stimulus to initiate the hatching procedures. This incubation was run along one month with hatching confirmation at day 2, 5, 8, 11, 14, 17, 22, 28 . This method was applied to sediments collected in 5 alpine ponds in two distinct seasons (spring and autumn). Hatchings were observed in both attempts in most of the ponds, namely for rotifers taxa. The period of the first hatching was different for each set of samples, with newly hatched planktonic organisms appearing earlier in the sediments collected in autumn. Moreover, a single emergence of a cladoceran taxa occurred, only in the autumn samples.

- **15312 | Beneficial effects of Fe₂O₃ nanoparticles on the growth and oxidative status of barley plants exposed to natural contaminated soils**

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As a result of anthropic pressures, such as industry, deforestation and waste disposal, soil contamination is increasing and, consequently, compromising soil functions and fertility. Among all contaminants, metals are one of the most common and important, being able to negatively affect the growth and development of plants. Thus, new and innovative ways to counteract the adverse effects of metals on plants are urgently needed. Nanotechnology, an emerging field in technological sciences, offers multiple tools that can be used for this purpose. In this way, this work aimed to evaluate the potential of Fe₂O₃ nanoparticles (NPs) to alleviate metal-induced stress in *Hordeum vulgare* L. (barley plants). For this goal, plants grew under two metal-contaminated soils (S1 and S2) of Estarreja (Aveiro, Portugal) treated and non-treated with 1% (w/w) Fe₂O₃ NPs. After 14 days of growth, biometric parameters (root length and fresh biomass) were evaluated, along with the analysis of several biochemical endpoints [photosynthetic pigments, lipid peroxidation (LP) and hydrogen peroxide (H₂O₂)]. After exposure to S1 and S2 contaminated soils, plant development was greatly affected, as evidenced by significant decreases in root length and fresh weight of roots and leaves. However, upon co-treatment with Fe₂O₃ NPs, this phytotoxicity was partially recovered, with less inhibitory effects on biometric parameters, especially in S1. This pattern was also noticed for levels of total chlorophylls and carotenoids. Regarding the oxidative damage, both S1 and S2 led to increases in LP, though H₂O₂ levels were only increased in S2. In response to the co-treatment with Fe₂O₃ NPs, barley plants exhibited less oxidative damage, which is evidenced by the decrease of H₂O₂ and LP in both soils. Altogether, the present study revealed that Fe₂O₃ NPs are able to enhance the tolerance of barley plants to contaminated soils, possibly by limiting the occurrence of oxidative stress.

- **15315 | Environmental studies of two new synthetic xanthenes**

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Although the side effects on human and animal health are usually investigated in thorough safety and toxicology studies, the potential environmental impacts of the manufacture and use of medicines/bioactive compounds with other applications are less well understood and have only recently become a topic of research interest. To determine the ecological impact of new drugs, knowledge of various parameters such as octanol/water partition coefficient (log Kow), solubility, and degradation evaluation is crucial [1].

In our research group, several xanthenes (XAs) were synthesized for potential pharmacological and other industrial applications. The aim of this work is to understand the ecological impact of two new synthesized XAs -XA13 and XA20- promising bioactive compounds, through the determination of the mentioned parameters.

In this work log Kow values were obtained through EPIWEB 4.1. Water solubility was evaluated by the shake-flask method. Degradation studies were performed during 2 months in different conditions of light and temperature. Following, XAs were extracted through solid phase extraction. Solubility and degradation assays went through the same treatment procedure: i) samples were evaporated to dryness; ii) resuspended with the respective organic solvent aiming to concentrate the analyte; iii) solubility and degradation concentrations were interpolated in calibration curves by HPLC-DAD.

Overall both XAs have a high log Kow (>3) demonstrating their potential to bioaccumulate. However, XA20 demonstrated a higher solubility value than XA13 plus a higher rate of degradation - half-life lower than 2 months.

Acknowledgments:

This work was funded under the project PTDC/AAG-TEC/0739/2014 (reference POCI-01-0145-FEDER-016793; Project 9471-RIDTI). C. Vilas Boas acknowledges the FCT support through the PhD fellowship SFRH/BD/136147/2018.

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- **15318 | The occurrence of the porpoise (*Phocoena phocoena*) in the mouth of the Douro river – state of conservation and anthropogenic threats**

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The harbour porpoise (*Phocoena phocoena*) is a small size protected cetacean with a distribution and food preferences that make it highly susceptible to anthropogenic threats. Its habitat varies in time and space and is influenced by natural and anthropogenic factors. Its habitat use is highly correlated with prey availability and density. However, there are possible limiting factors, often related with anthropogenic activities, that may, not only affect animals' behaviour and well-being, but also lead to habitat shifts and conditioning of the habitat use. Main threats to porpoises are: fishery bycatch, overfishing leading to prey depletion and pollution (chemical and noise pollution).

In 2017, harbour porpoises were spotted at the Douro river estuary for the first time. Then, a land-based monitoring programme started in the region in order to understand patterns of occurrence, the factors that condition them and their overlap with human activities. Surveys were made from "Molho do Douro", whenever environmental conditions allowed, and following a standard protocol. Observers searched for porpoises' presence, with or without binoculars, and then completed log sheets with number of animals sighted, behaviour, area of occupation, meteorology, number of boats, fishing lines, birds and fishermen.

In total, 52 monitoring surveys were undertaken, resulting in 154.13 hours of observation and 41 sightings of porpoises. The group has, at least, four animals, one of them with a rare morphological condition that makes him easily recognized: leucistic animal. Here, we present a preliminary analysis of i) the occurrence of this group of porpoises; ii) an evaluation of anthropogenic activities in the area (number of fishing lines and vessel traffic); iii) an overview of the relationship between the occurrence of the porpoises and the human activities.

- **15321 | Synthetic pathway towards a polyoxygenated xanthone with anti-aging potential**

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Natural products are privileged sources of antioxidants, which have been widely used in the cosmetic industry in sunscreens and anti-aging formulations. Particularly, seaweeds, chlorophyll-containing photosynthetic marine macroscopic algae, can be valuable source of natural antioxidant compounds since they have a well-developed antioxidant defence system, and include sulfated polysaccharides, bromophenols, xanthones, among others. Previous structure-activity relationship studies suggested that synthetic simple hydroxylated xanthones with vicinal diol groups have promising antioxidant activity.[1] Given that, this project aims to synthesize new trihydroxy-xanthones and to further evaluate their antioxidant properties by the 2,2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging effect.

Herein, the pathway towards the synthesis of 1,2,4-trihydroxyxanthone starting from salicylaldehyde and 1,2,4-trimethoxybenzene through acyl radical intermediates [2] will be presented and discussed. Structure elucidation of the intermediates was established by infrared (IR) and nuclear magnetic resonance (1D and 2D NMR) techniques. The intermediates and the target compound will be assessed for their antioxidant activities.

Aknowledgments

To FCT and ERDF, PT2020 by the Strategic Funding UID/Multi/04423/2013, the project PTDC/MAR-BIO/4694/2014 (POCI-01-0145-FEDER-016790;3599-PPCDT), POCI-01-0145-FEDER-028736 and INNOVMAR (NORTE-01-0145-FEDER-000035, within Research Line NOVELMAR), supported by NORTE 2020, under the PORTUGAL 2020 Partnership Agreement, through the ERDF. Mariana Almeida acknowledges the BYT CIIMAR 2018/19 scholarship and Diana I. S. P. Resende thanks for a postdoctoral grant (NOVELMAR/BPD_2/2016-019).

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- **15322 | Establishment of bioengineered glucose-responsive nanoparticles for type 1 diabetes mellitus therapy**

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Diabetes mellitus (DM) is one of the biggest health problems in the world with a high socio-economic impact. Type-1 (T1DM) is characterized by insufficient insulin secretion due to the destruction of pancreatic beta-cells and it accounts for 10% of the total cases of DM. Current treatment options do not restore pancreatic functions and new clinical approaches are urgently needed. Glucagon-like peptide-1 (GLP-1), an endogenous gastrointestinal incretin hormone that stimulates insulin secretion and β -cell proliferation, is considered an attractive therapeutic agent for T1DM treatment. Nevertheless, its very short half-life has led to the development of nanocarriers-based strategies using degradation resistant GLP-1 analogous to ensure the intended biodistribution profile of the drug. Here, we propose the production of polymeric pH-sensitive nanoparticles (NP) loaded with exenatide, an FDA-approved GLP-1 analogous, surface-functionalized with Glucose Oxidase (GOx) that will release its payload only at acidic pH. The pH-sensitive release will be achieved by the use of both PLGA and Eudragit E100 as polymeric matrix which will be soluble in the acidic environment created by the increased amounts of gluconic acid produced from glucose degradation by GOx. Monodisperse exenatide-loaded PLGA/Eudragit E100 NP with different polymer proportions were successfully produced and characterized, revealing sizes between 110 and 180 nm and zeta potentials between 40 and 50 mV. Also, a pH-dependent degradation study showed that NP disruption started at pH 6 and it increased with decreasing pH. Currently, GOx is being chemically conjugated to NP surface through two different methods, EDC/NHS chemistry and using BS3 as a crosslinker. Finally, the release profile of exenatide at different pH and the long-term stability will be evaluated and the best formulation will be part of a pancreas surrogate that could be part of a suitable and innovative cell therapy treatment for T1DM.

- **15324 | Exploring the potential of *Corema album* (L.) D. Don berries for human health: phenolic profile and neuroprotective effects**

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Corema album (L.) D. Don is an endemic specie of the Atlantic coast of the Iberian Peninsula. The fruit, designed "white crowberry", has been consumed by humans for many centuries and used to treat fevers and infections. Despite its traditional use, the phytochemicals composition and bioactivity of *C.album* berries is poorly characterized. Thus, the main goal of this ongoing work is to establish a correlation between phenolic composition of the aqueous extract of *C.album* berries and its biological activity in the context of degenerative brain diseases. HPLC analyses showed that aqueous extract of *C.album* berries is a mixture of phenolic compounds, particularly rich in phenolic acids (e.g.chlorogenic acid), flavonols (e.g.rutin) and anthocyanins (e.g.cyanidin 3-O-glucoside).*C.album* berries extract has the ability to scavenge DPPH and superoxide radicals, and a concentration-dependent ability to protect membrane lipids from the oxidation promoted by external oxidant agents. Cell-based assays also revealed that *C.album* berries extract has the ability to protect, at non-cytotoxic concentrations, the SH-SY5Y cells against the toxicity promoted by glutamate. Preliminary results with cells indicate that neuroprotective effects of *C.album* extract are associated with an improvement of the functionality of the antioxidant enzyme system (e.g.GR, GPx, SOD). Our data suggest that *C.album* berries extract has the ability to modulate several biochemical pathways with putative beneficial impact on neurodegenerative processes. Thus, this work opens new opportunities to value white crowberries by using them to prepare nutraceuticals and functional foods, and/or as resource of phytochemicals for drug development. Acknowledgments: FCT/MEC (UID/QUI/50006/2013), FEDER (Partnership Agreement PT2020), NORTE2020, PORTUGAL2020, ERDF (NORTE-01-0145-FEDER-000024), POCTEP (0377_IBERPHENOL_6_E). D. Mendes (SFRH/BD/138206/2018) thank FCT/ME.

- **15326 | Intracellular adenosine released from Leishmania infected macrophages is involved in an autocrine control of macrophage response, through A2 adenosine receptors activation**

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Visceral leishmaniasis is the most severe form of Leishmaniasis, being fatal if left untreated. Evidence showed that adenosine production at the site of infection is a crucial factor for the virulence of several Leishmania species. However, the immunoregulatory role of adenosine in visceral leishmaniasis is not completely understood. The present study aimed at clarifying the role of adenosine in Leishmania infantum infected macrophages. *L. infantum* promastigotes expressing luciferase were used to allow quantification of the parasitic burden. All adenosine receptor subtypes (A1, A2A, A2B, A3) are present in the macrophage model used in this study (THP-1 differentiated macrophages), as revealed by immunocytochemistry. After infection, treatment with adenosine deaminase (ADA), which deaminates adenosine into inosine, reduced the parasitic burden by $29,0 \pm 2.2\%$ ($p < 0.001$). Blockage of individual adenosine receptor subtypes showed that A2A and A2B adenosine receptors were tonically activated and involved in Leishmania persistence in macrophages. Moreover, activation of both A2A and A2B adenosine receptor were found to be critical for the suppression of nitric oxide release from infected macrophages, highlighting the role of both receptors in favouring Leishmania infantum survival in macrophages. This study also demonstrated that the observed tonic activation of A2 adenosine receptors in infected macrophages was highly dependent on the action of equilibrative nucleoside transporters. In line with these observations, this work showed that extracellular adenosine metabolic enzymes (CD39, CD73 and ecto-ADA enzymes) do not appear to have a relevant role for the tonic activation of the A2 adenosine receptors. These results open the possibility to use well-established nucleoside transporter inhibitors (dipyridamole) or A2 adenosine receptor antagonists (pentoxifylline) already approved to treat other conditions as new pharmacological approaches to treat leishmaniasis.

- **15331 | Dehydrated fruits: beneficial health effects and contribution to food security**

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From a nutritional point of view, fruits are an essential part of a balanced diet that provide dietary fiber, vitamins, essential minerals, and phytochemicals that confer significant health benefits besides basic nutrition [1]. According to the World Health Organization, there is a strong evidence that a sufficient fruit consumption helps to prevent diseases and promote good health, but most of the world's population consumes insufficient amounts [2].

Most of the fruits are seasonally produced and are not available along the year as fresh food. There is thus a need to process them to prolong their shelf life and availability for consumers. One of the techniques used is dehydration [3], which consists in reducing the amount of available water, inactivating microorganisms and enzymes that can lead to fruit deterioration. An enhance of their antioxidant activity with this processing was also described [4]. Based on that, dehydrated fruits are included in the category of healthy snacks, as they provide the nutritional content of fresh fruit in a more concentrated form, being a healthier alternative to salty or sugary snacks [3]. This review highlights the interest in the health benefits of dried/dehydrated fruits based on the type and amount of different groups of biologically active phytochemicals found in this type of products. The use of dehydrated fruits also avoids wastes, contributing for food security.

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Acknowledgements: The authors thank the financial support to the projects Operação NORTE-01-0145-FEDER-000011 and UID/QUI/50006/2013-POCI/01/0145/FEDER/007265 (financial support from FCT/MEC through national funds and co-financed by FEDER).

- 15335 | Can the cup foresee the coffee flavor? -An electronic nose proof of concept study

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The use of electronic nose in the food industry is an emerging technology. Coffee is one of the most popular and widely consumed beverages across the world and has strong cultural and economic impacts. The final quality of coffee is mostly due to its flavour highly dependent of its volatile organic compounds profile and as several materials are now available to serve coffee maintaining the sensory consistence is a demand. Therefore, we hypothesized that an electronic nose may discriminate coffee samples served in cups with different materials.

Coffee volatiles from the same Portuguese brand, served from the same vending machine were examined with a Cyranose 320 (Smith Detections, Pasadena, CA). Data acquisition after five minutes heating at 40°C of ten 3mL samples, of each coffee from a cup of glass, paper, plastic and porcelain was performed. The resulting data were analyzed using principal component reduction. The primary endpoint was cross-validated accuracy, defined as the percentage of samples correctly classified using the leave-one-out method. The cross-validated accuracy of the eNose in identifying coffee was 92.5%

These preliminary data indicate that coffee served in different cups has a distinct exhaled VOC profile that can be detected with eNose technology. Further studies should address the development of an "optimal" cup material for an "optimal" matrix of coffee volatiles.

- 15336 | Effects of soil contamination by glyphosate on a cover crop species (*Trifolium repens* L.)

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Nowadays, the need to meet the dietary requirements of a growing human population is becoming challenging, as supporting natural resources are each day more impacted. However, either due to infesting plants/pests or loss of soil quality and biodiversity, the yield of the crop can be highly conditioned. Thus, crop management is increasingly dependent on the application of pesticides and herbicides. Glyphosate (Gly) is a non-selective herbicide, produced by Monsanto®, and it is one of the most plant protection products in several countries. Although very efficient, its non-selective mode of action may end-up in several negative effects on non-target species (cover crops and wild herbs). However, Gly effects on these non-target species remain to be elucidated. Thus, this study aims to assess whether the use of this herbicide has negative impacts in populations of a cover plant species, *Trifolium repens* L. (white clover). In order to achieve this goal, *T. repens* plants were grown in an artificial soil contaminated by Gly at two ecologically relevant concentrations (5.9 and 7.3 mg kg⁻¹ soil). After 21 days, plants were harvested for growth evaluation (fresh weight) and for the analysis of the photosynthetic pigments (total chlorophylls and carotenoids). The results showed that, for the concentrations tested, Gly did not negatively affect the photosynthetic pigments. However, regarding fresh weight, the exposure of plants to Gly resulted in a marked decrease of this parameter in a concentration-dependent manner, unequivocally indicating that this herbicide is a serious threat to *T. repens*. In the future, other biochemical parameters, particularly related to the induction of oxidative stress, will be analyzed along with the evaluation of pollen fertility and morphology, to establish a relationship between the presence of Gly and other parameters more related with the sustainability of the populations of non-target species.

- **15337 | Endogenous components from fingermark residues: A chemical approach towards fingermark dating**

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Fingerprints are one of the oldest methods of personal identification, initially by visual and comparative analysis. Due to their undeniable utility in Forensics, nowadays fingermarks still constitute one of the most important physical evidence in criminal investigations. Recently, the analytical community has shown a huge interest towards pinpointing the fingermark chemical composition, as it became clear that its exploitation would have a huge potential to enhance the value of forensic evidence, significantly contributing to empower investigations and strengthen judicial debates.

As such, the chemical characterization of fingermark residues was achieved through GC-MS and HPLC-DAD, enabling the identification of a series of endogenous components such as fatty acids, fatty acid esters, cholesterol esters and uric acid derivatives, palmitic acid and squalene, being identified as the main constituents. Relevantly, quantitative analysis of aged fingermark residues evidenced a time-dependent degradation of squalene, being undetected seven days after the fingermark deposition. As such, this endogenous triterpene constituent can be portrayed as a time-dependent molecular marker with potential to estimate the age of fingermark deposits.

Acknowledgments: This work received financial support from IINFACTS: financial program GID-CESPU, 2018, PI4AC: Project LFCChemPro.

- **15339 | Selective oxidized carbon nanomaterials as electro-Fenton catalysts for pollutants degradation**

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Electro-Fenton processes are one of the most promising techniques for organic pollutants degradation [1]. In these processes, H₂O₂ is electrochemically produced by O₂ reduction in acidic medium, and used to generate extremely reactive HO· radicals, which oxidize the organic pollutant [2]. Iron salts are added to complete the Fenton process.

Oxidized graphene and multi-walled carbon nanotubes (MWCNTs), prepared by three different oxidation treatments (with O₂, nitric acid or nitric acid plus thermal treatment) [3], were tested as electrocatalysts for the production of H₂O₂ from the oxygen reduction reaction (ORR). A rotating disk electrode (RDE) of glassy carbon or a rotating ring disk electrode (RRDE) of glassy carbon with a Pt ring were used as working electrodes and modified with the carbon nanomaterials. The prepared electrocatalysts followed the 2 electrons pathway, promoting the reduction of O₂ to H₂O₂. The studies showed that, in general, the oxidized MWCNTs are more selective for the H₂O₂ production than the oxidized graphenes. The influence of the type of oxygen groups and their content in the amount of H₂O₂ produced was tentatively assigned. The most promising electrocatalysts were tested for the degradation of organic pollutants in water by electro-Fenton. Methyl orange, a widely used dye, was selected as pollutant model.

Acknowledgments:

FCT - Fundação para a Ciência e a Tecnologia, I.P. (UID/QUI/50006/2013; POCI/01/0145/FEDER/007265) and project WaterJPI/0007/2016.

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- **15340 | Exploring zinc deficiency response mechanisms to induce zinc biofortification in plants**

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Zinc plays several important roles in living organisms including protein structural and activity regulation. As a crucial micronutrient, zinc is of major interest in agronomy and for human and animal nutrition. However, the molecular mechanisms that regulate zinc homeostasis are poorly understood. Studies conducted with the plant model *Arabidopsis thaliana* connect zinc homeostasis with the metal transporter (Zrt/Irt)-like protein (ZIP) family. One member of this family, *ZIP4*, is highly expressed in both shoots and root tissues in response to zinc starvation conditions. The induction of *ZIP4* expression is dependent on the activity of two transcription factors of the bZIP family, bZIP19 and bZIP23. These transcription factors are essential for the plant to survive under zinc deficiency and are highly conserved across land plants. In the present work we will explore the functional connection between bZIP19/23 and *ZIP4* by using diverse molecular biology approaches. Understanding these molecular processes that control zinc levels and distribution in land plants will have a tremendous contribution not only to plant yield but especially to crop biofortification.

- **15341 | 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 zebrafish hoxd13a in developing fins, we found formation of additional distal bone tissue and reduction of the embryonic dermoskeleton (finfold), recapitulating the events thought to have occurred during evolution.

It is now crucial to understand how modulation of this master transcription factor may have affected the production of bone structures and the blockage of dermoskeleton formation during evolution of vertebrate appendages. Here, we have tested 10 putative downstream targets for Hoxd13 that are relevant for endoskeleton formation in mice limbs, after overexpressing this gene in transgenic zebrafish. We found that them to be ectopically up-regulated in the distal margin of these zebrafish. We also generated a transgenic line allowing bmp2 overexpression, which caused a phenotype characterized by shortening of the finfold. Taking in account the role of bmp proteins during limb development, we hypothesize that during evolution increased levels of Hoxd13 transcription factors may have up-regulate bmps that then inhibited factors responsible for the elongation of the finfold, which typically characterizes fish fin development. Currently we are working with a mutant zebrafish line, still uncharacterized, but with long-fin phenotype and our aim is to use it as a model to confirm that dermoskeleton size is dependent on hoxd13-bmp2 starting with comparative gene expression assays. Our hypothesis is that this zebrafish line might have a mutation that conditions the expression of these genes, being therefore useful to further explore the molecular mechanisms associated to the fin-to-limb transition.

- **15342 | Understanding reduced penetrance in Mendelian diseases.**

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In the many genetic diseases clear genotype-phenotype relationships are lacking, possibly due to distinct factors of complexity like amino acid interactions, gene-gene interactions, gene-environment interactions, etc. The reduced penetrance is also observed in single gene diseases (Mendelian) within affected families.

To further understand phenotypic heterogeneity, we will use as a model an urea cycle enzyme, ornithine transcarbamylase (OTC), in a study that will be focused on epistatic interactions between disease-associated amino acid residues and polymorphic sites, due to missense mutations. Arg40His is frequently found in OTC deficiency patients generally associated with a mild phenotype, but it can be lethal. However, it is intriguing that the wild-type amino acid residue at the analogous location of the OTC protein of the Rhesus Macaque (*Macaca Mulatta*) corresponds to histidine, the very same residue that is deleterious in humans. It is assumed that the presence of compensatory mutations might buffer the deleterious effect of the Arg40His. A critical residue in this hypothesis of compensation may be the Lys46Arg polymorphism. To understand the molecular basis of the putative interaction between position 40 and 46, we analyzed several protein models corresponding to distinct genetic backgrounds. Preliminary results show that the Lys46Arg polymorphism somehow stabilizes the OTC protein with the corresponding Arg40His mutation due to the formation of new H-bonds.

This work was financed by FEDER funds through the COMPETE 2020, Portugal 2020, and by Portuguese funds through FCT in the framework of the projects POCI-01-0145-FEDER-007274 and POCI-01-0145-FEDER-029723.

- **15344 | Influence of planctomycetes' natural carotenoids in zebra fishes' coloration as a dietary supplement**

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Planctomycetes are a phylum of bacteria that can be found in fresh, marine or brackish waters. Their colour can be white, orange and often pink, due to carotenoids. Previous studies showed that *Daphnia magna* can incorporate planctomycetes pink coloration and that their fertility was improved when the planctomycete *Rhodopirellula rubra* was provided as supplement to the normal food in a mixed diet (Antunes et al., 2016; Marinho et al., 2018). In line with this background information, this study aimed to assess if the natural carotenoids present in *R. rubra* could confer colour and also reproductive advantages to the organisms under study, two aspects of interest in fish aquaculture. A set of assays with zebrafish (*Dario rerio*) on larval stage fed with the pink planctomycete were conducted to assess the adequacy of this bacterium to be used as a food supplement to the fish. On the other hand, the juvenile stage of *D. rerio* will be fed with *D. magna*, previously enriched in color with *R. rubra* added as food source. Parameters like fish pigmentation, growth and fertility will be evaluated in several feeding experiments.

- **15345 | Luminescent Decatungstoeuropate@Metal-Organic Framework Composite Materials**

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Metal-organic frameworks (MOFs) are crystalline materials, consisting on metal clusters coordinated with organic linkers to form highly porous, chemically and thermally stable 3D networks. Such features make these materials highly regarded in studies involving catalysis, gas storage, or as a solid support in the preparation of functional materials by incorporation of large inorganic species, such as polyoxometalates (POMs) [1]. More recently, lanthanide MOF composite materials have gained attention, mainly due to their effective use at luminescent chemical sensing. Lanthanide-based luminescence is known for its line-like emission, resulting in high color purity of the emitted light [2]. The combination of the lanthanide's luminescence properties and MOF's robustness makes this type of material exceptional candidates for the selective detection of analytes [3].

The present work describes the synthesis and characterization of new luminescent composite materials based on MOFs and lanthanide-containing POMs. Three MOFs were synthesized using previously reported solvothermal methods, namely UiO-66, UiO-66-NH₂ and MOF-802. The composite materials were prepared by incorporation of the decatungstoeuropate into the MOF via direct impregnation. Characterization was performed by FTIR, XRD and SEM/EDS, confirming the successful preparation of the composite materials.

Acknowledgments

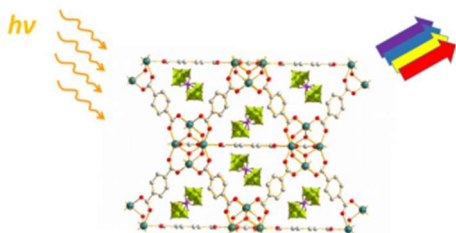
This work was partly funded through the project REQUIMTE-LAQV, POCI-01-0145-FEDER-007265 [FCT (Fundação para a Ciência e a Tecnologia) Ref. UID/QUI/50006/2013] financed by national funds through the FCT/MEC and when appropriate co-financed by FEDER (Fundo Europeu de Desenvolvimento Regional) under the PT2020 Partnership Agreement.

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Schematic representation of a lanthanide POM@MOF composite material

- **15347 | Effect of fluorophores on Lactoferricin antimicrobial peptides/membrane interactions**

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Bacterial resistance against antibiotics has been one of the major concerns in public health in the past decades. One of the most studied alternatives to antibiotics are the antimicrobial peptides (AMPs), as their mechanism of action aims at the bacterial membrane, being thus less prone to induce resistance. It has been widely demonstrated that AMPs (native or constructed) have a large activity against bacteria, fungus and even cancer cells.

This work is part of a larger study of AMPs from the bovine Lactoferrin family, characterizing their interaction with pathogens and model membranes with a composition that mimics bacteria's membranes, aiming at the understanding the mode of action of these AMPs.

Sometimes we need to include fluorophores in the peptides, e.g., for localization studies by fluorescence microscopy. As such, we need to ascertain the effect of the fluorophore on the interaction. In present study we compared the peptide LFcin 17-30 with its marked forms LFcin 17-30-TAMRA-C, LFcin 17-30-TAMRA-N and D-LFcin 17-30-TAMRA-C. The technique used to assess their interaction with membranes was Differential Scanning Calorimetry (DSC).

The different effect of the various peptides upon the membrane transition - profile and temperature - will be shown and discussed.

- **15352 | Gene loss in Chiroptera evolution**

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The evolution of Chiroptera, commonly known as bats, entailed specific adaptations, including the notorious refitting of forelimbs into webbed wings, but also other morpho-functional innovations related with sensory organs, immunity, diet or even fertilization and reproduction.

Here, we aimed to identify and investigate gene loss events associated with Chiroptera evolution. By screening available low quality protein predictions, suggesting coding sequence rearrangements to match expected protein translation, we identified a candidate gene, equatorin (*Eqtn*). *Eqtn* is responsible for encoding a membrane protein which is located in the acrosomal membrane of sperm cells. Using a knockout mouse model *Eqtn* was suggested to participate in acrosome reaction during egg fertilization.

Thus, to determine the coding status of Chiroptera *Eqtn*, the corresponding coding sequences were manually reconstructed in 6 species. Using *Homo sapiens Eqtn* as reference, exonic sequences were mapped to the corresponding genomic regions. Next, aligned regions were individually analyzed in order to identify possible protein-altering mutations.

Preliminary results highlighted several mutations, across all analyzed Chiroptera species (*Desmodus rotundus*, *Eptesicus fuscus*, *Hipposideros armiger*, *Myotis brandtii*, *Pteropus vampyrus*, *Rhinolophus sinicus*) that may affect protein function. However, future studies are required to fully address the physiological outcome of *Eqtn* erosion in light of Chiroptera reproductive strategies.

- **15354 | Images speak louder than words: the botanical illustration printing collection of the MHNC-UP Herbarium**

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Before digital photography and modern digital printing, all publications had to go through a mechanical printing process. For this purpose, typographic plates were made with the necessary schematic drawings, photographs and illustrations. Linking typographic plates to academic articles is important for a better understanding of the process of making of scientific journals and other academic publications from a historical science perspective. This type of research can also lead to a more profound knowledge of the lives of researchers and artists, and the history of typography in the city.

The 196 metal printing plates studied in this work are part of the Porto Herbarium (PO) collection of the Museum of Natural History and Science of the University of Porto (MHNC-UP). Through research of the catalogue of the Library of FCUP and books belonging to the museum, the scientific printing plates existing in the MHNC-UP Herbarium's collection were matched to their images and to the respective papers. This collection has metal plates linked to articles with publication dates ranging from 1934 to 1963, and 92% of specimens have been matched to some paper or publication. All the plates are linked to scientific papers, mostly on biology but a few on medicine, except for two: eulogies of Cacilda Roseira Dias and Augusto Nobre. Additional information was gathered, material condition assessed and photographs taken for inventory purposes. Each plate was individually conditioned and tagged with an inventory number.

Further study on the topic would be of interest given the lack of existing research as well as the avenues of study not pursued in this paper such as the registry of purchase of these objects. This paper benefited from the use of the Portuguese Infrastructure of Scientific Collections (PRISC.pt) (POCI-01-0145FEDER-022168)

Keywords: Botany, Portuguese Flora, Museum Studies, Scientific Illustration, Natural History

- **15355 | Reflections on Professionalism in Educational Sciences: Internships in School Management**

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Our curricular internships (3) as students of FPCEUP and of the Master of Educational Sciences in Administration, Management and Implementation of Leadership, we present reflexes of professionalism in Educational Sciences, through the experiences from the articulation of the directions of two different schools.

Our main objective is to promote a global and creative citizenship through the participation of young people in the decisions of and about their school. One of the internships is developed in an elementary and secondary school, which shows many concerns regarding the participation of young people in the decision. This intervention has its focus on the creation of school assemblies, to promote the sharing and discussion of ideas, and sessions will be structured with the students to raise awareness of active participation and citizenship.

The other two internships are being developed in another group of schools. The first is in a 1st cycle elementary school with kindergarten. Thru the coordination, involving the educational community and other partners, we propose the creation of a space where it is possible to hear the children's voices regarding how they play and behave in the playground; and organize assemblies about it - giving the possibility of older kids to be mentors of the newest.

The other internship, developed in the same group, but on a elementary school, has as subject of intervention from the school direction, articulate school mediation and education for global and creative citizenship, through a collaborative work between mentors and mediators (young students), in addition to sociocultural activities, like cultural and musical events.

Following an interactive epistemology (Correia, 2018) in the course of this work we imagine a conceptualization and implementation of the Pedagogic and Educational Action Lab which senses are built with educational sciences specialists and as an innovative practice in development according to the directions.

- **15357 | Renin-angiotensin system markers and established scoring systems for acute heart failure**

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Background: Acute heart failure (AHF) causes high morbidity and mortality. Scoring systems as APACHE II and SAPS II are used to determine severity and predict mortality, but biomarkers are needed to stratify patients and ground therapeutic decisions. The renin-angiotensin-aldosterone system (RAAS) is linked to the pathophysiology of heart failure and its components might emerge as biomarkers for AHF.

Aim: To evaluate whether components of the RAAS correlate with APACHE II and SAPS II scores in patients with AHF.

Methods: Protocols were approved by the Health Ethics Committee of Centro Hospitalar São João. Patients gave their informed consent and APACHE II and SAPS II scores were taken. Blood and spot urine samples were collected from patients with AHF (n=9), cardiogenic shock (CC, n=7) and non-cardiogenic shock (NCC, n=6) within 48 h of hospital admission. Plasma aldosterone levels, renin and ACE activities were measured by routine laboratory analysis; urinary excretion of angiotensinogen (UAGT) was quantified by ELISA. Spearman correlation analysis was performed between RAAS parameters and APACHE II and SAPS II scores.

Results: There was a positive correlation between renin activity and both scores when all patients were considered ($r=0.497$, $p<0.05$ for APACHE II and $r=0.609$, $p<0.05$ for SAPS II). No significant correlation was found between UAGT, aldosterone levels or ACE activities and the scores ($p>0.05$).

Conclusions: Our preliminary results suggest that renin activity might be associated with the severity of AHF or the risk of mortality.

Acknowledgements: This work was funded by FEDER funds via COMPETE (Portugal 2020) and by national funds through the Portuguese Foundation for Science and Technology (FCT) (project RIFF-HEART; PTDC/MEC-CAR/32188/2017).

- **15360 | Phytotoxic effects of Glyphosate on the growth and physiological status of a cover plant species, *Medicago sativa***

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The extensive application of pesticides in agriculture has resulted in the contamination of soil ecosystems. As a result, soil contamination by pesticide residues has become a matter of increasing concern due to their persistence and toxicity to non-target species. Therefore, it becomes important to understand the reliability and biological effects of such compounds, to ensure a sustainable use of soils in areas of great economic value. Glyphosate (Gly) is a systemic herbicide of broad spectrum, that, due to its intensive use, has been gaining special attention regarding its potential hazards for the environment. This work presents an analysis of the impact of Gly on a cover plant, which primarily manages soil erosion, fertility and quality. These plants are of extreme importance as many of them improve the sustainability of the agroecosystem attributes and may also indirectly improve qualities of neighboring natural ecosystems. Thus, the main objective of this work was to unravel the effects of soil contamination by Gly on a cover plant species, *Medicago sativa*. For this purpose, plants were grown in an artificial soil contaminated with increased doses of Gly (0-40 mg kg⁻¹) and, after 21 days, several biometric parameters (fresh mass, root and shoot length), and lipid peroxidation (LP) were analyzed. Based on our data, it was possible to observe that Gly greatly impaired *M. sativa* growth in a concentration-dependent manner, reaching reductions up to 90% in both root and shoot fresh biomass. Regarding LP, Gly induced an increase of this parameter in both analyzed organs, especially in the highest treatments. Altogether, our findings suggest that Gly negatively affects the physiological status of *M. sativa*, inhibiting their growth and triggering the occurrence of oxidative stress. Future studies will focus on the evaluation of other oxidative stress markers, such as cell death and hydrogen peroxide, as well as on Gly effects on nitrogen metabolism.

- **15362 | Effect of Different White Tea in testicular somatic Cells**

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Tea is the second most popular drink in the world. It is prepared by infusing leaves of the plant *Camellia Sinensis* (L.) into hot or cold water. Tea is divided in four types: green, black, oolong and white. The white tea (WTEA) remains as the less studied though our previous reports show that it has more biological activity than green tea. Based on the processing, WTEA can be classified as: Bai Hao Yin Zhen (BHYZ), Bai Mu Dan (BMD), Gong Mei (GM) and Shou Mei (SM). These WTEA differ in quality, flavour and performance being that BMD and BHYZ are the most consumed in oriental countries. Many beneficial health effects are attributed to WTEA since it is a potent antioxidant. Spermatogenesis depends of an oxidative homeostasis, particularly in Sertoli cells which are responsible for the physical and nutritional support of the developing germ cells. In this work we evaluated the effects of WTEA extracts (particularly BMD and BHYZ) in primary culture of human Sertoli cells (hSCs). Primary cultures of hSCs were established from testicular biopsies of men with conserved spermatogenesis seeking for fertility treatment due to anejaculation. Reaching confluence of 85% cells were exposed to increasing different concentrations of WTEA extracts, BMD and BHYZ (0, 0.05, 0.5 and 5 mg/mL) during 24h. Cellular growth and cytotoxicity was analysed using two distinct methods: the SRB and the MTT assay. Our results show that both extracts have distinct outcome regarding the in vitro growth of hSCs. While the BMD extract failed to have any effects on hSCs growth, the BHYZ extract stimulated hSCs growth after 24h at the concentrations of 0.5 mg/mL and 5 mg/mL. These results provide clear evidence that WTEA extracts biological activity on hSCs depends of the processing. Further studies will be needed to characterize how these changes in hSCs functions have an impact on spermatogenesis and if there is any reproductive health benefit in the consumption of any of these WTEA grades.

- **15367 | Assessment of water quality in Leça river using benthic macroinvertebrates as bioindicator.**

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The water pollution in the rivers and the changes in the biotic communities of freshwater ecosystems are issues that have been discussed along the recent years and are a social, economic and conservation concern. Limnological studies allowed to perceive continuous modifications in the waterbodies and to understand the implication of these disturbances. The present study aimed to characterize and evaluate the water quality in a specific point of Leça river. To achieve our goal, in situ physical and chemical water parameters were assessed. Additionally, water samples were collected to conduct further analyzed (e.g. nutrients content) in laboratory. Benthic macroinvertebrates were also collected and screened in laboratory conditions, and further identified to the family taxonomic level in order to apply water quality biotic indexes (IBMWP and IASPT). Regarding physical and chemical parameters, the studied site presented high amounts of water nutrients as phosphorous and nitrates, classifying the river water as in poor status. Macroinvertebrate communities presented low diversity and richness values. Results of IBMWP demonstrated that the studied site in the Leça river presented poor ecological status. IASPT index also presented low values due to the low scores of the families taxonomical groups found. With this work, it was possible to verify the poor water quality in the studied site of the Leça river and to verify that the results obtained were below the minimum values of good quality proposed by the WFD.

- **15372 | PREVALENCE OF FALLS AND ITS ASSOCIATED VARIABLES IN OLDER ADULTS ACROSS EUROPE**

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As a person ages, the risk of falls increases. The risk factors that can lead to a fall are biological, environmental, behavioural and socio-economic. Falls can lead to a lower quality of life of the patients as it leads to depression, decreased activity and mobility, reduced social contact, higher medication use, hospitalizations or fatal injuries. This study aims to evaluate the prevalence and factors related to falls in older adults across 17 European Countries, plus Israel, in population aged 55+.

In this cross-sectional analysis, we used data from participants aged 55 or more from Wave 6 of the Survey of Health, Ageing, and Retirement in Europe (SHARE). Falls prevalence was assessed through the answer "Falling down" to the question "For the past six months at least, have you been bothered by any of the health conditions on this card?", and its association with age, gender, frailty status, network satisfaction, depression and polypharmacy was explored.

From all the 68231 participants included on SHARE's wave 6, we only included the participants that answered to all the questions related to gender, frailty status, network satisfaction, depression and polypharmacy, aged 55 or more, resulting in a final sample of 42023 participants, being 56.3% female, with an average age of 70.0 ± 8.9 years. Greece, Slovenia and Sweden are the countries with lower prevalences of falls, while Luxembourg, Czech Republic and Portugal have higher prevalences. The overall prevalence of falls was of 7.6%, being higher in women (9.1% compared with 5.6% on men) and increasing along age groups. Age, gender, frailty status, network satisfaction, depression and polypharmacy were significant variables associated with falls.

Falls were found to be a highly prevalent condition in the elderly population. Identification of variables associated with falls, such as those identified in this study, is important to identify and monitor the elderly groups, which are most vulnerable to falls.

- **15374 | Effect of iNKT cells on macrophage polarization and survival in human Colorectal Cancer**

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Invariant Natural Killer T (iNKT) cells are CD1d restricted, lipid reactive, T lymphocytes that have a semi-invariant TCR. This T lymphocyte subset has important immune-regulatory properties including regulation of macrophages, dendritic cells and B lymphocytes activity. iNKT cells are known to play a protective role in cancer progression, which has been clearly demonstrated in cancer mouse models. Cancer progression depends on the interaction between several cells. Although immune cells work usually as inhibitors of tumour proliferation, sometimes they can be reprogrammed to attain a pro-tumour activity as it happens with macrophages. According to stimuli present in the microenvironment, macrophages may polarize to M1-like (pro-inflammatory), that exert immune-stimulatory and anti-tumour activities, or to M2-like (anti-inflammatory) macrophages with pro-tumour and immune suppressive roles. In mice, iNKTs have been shown to play a key role in macrophage polarization, favouring the polarization in the M1 phenotype and displaying a protective role in prostate cancer. Recently, we have shown that normal and tumour Extracellular Matrices (ECM) differently influence the polarization of macrophages into distinct phenotypes. On human tumour decellularized matrices derived from colorectal cancer patients surgical resections, macrophages polarize to a M2-like anti-inflammatory phenotype, beneficial for cancer progression. Based on these two works, we are doing functional in vitro studies to evaluate the effect of human iNKT on macrophage polarization in colorectal carcinoma extracellular matrix. Our preliminary results suggest that iNKT induce macrophage death mediated by the expression of CD40. Currently, we are optimizing the macrophages and iNKT co-culture ratios to, then, access by flow cytometry the macrophage viability, polarization and phagocytic activity.

- **15375 | IMPACT OF GLUTATHIONE PEROXIDASE AND CATALASE INHIBITION ON OXIDATIVE STRESS MODIFICATIONS OF ERYTHROCYTE MEMBRANE**

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In this work, we aimed to study the impact of glutathione peroxidase (GPx) and catalase (CAT) inhibition on oxidative stress (OS) changes on red blood cell (RBC) membrane.

We performed in vitro assays (n=3) by incubating with RBCs from healthy volunteers without and with specific inhibitors of GPx (mercaptosuccinic acid) and/or of CAT (sodium azide); RBC membranes were isolated, membrane bound GPx and CAT amounts were assessed by western-blot; membrane bound hemoglobin (MBH) and lipid peroxidation (LPO) were also evaluated by spectrophotometric methods.

MBH and LPO (OS biomarkers) showed the highest values when GPx was inhibited, intermediate when both enzymes were inhibited; MBH presented the lowest value for CAT inhibition, and LPO was lowest for no enzyme inhibition. Catalase was detected in the RBC membrane for all conditions, presenting the lowest values when CAT was inhibited and the highest when both GPx and CAT were inhibited. GPx bound to the membrane whenever CAT was inhibited (alone or together with GPx), and its amount was the highest when both enzymes were inhibited.

In conclusion, inhibition of GPx and CAT, either alone or simultaneously, leads to OS membrane modifications, as showed by the increase in MBH and LPO. Moreover, GPx inhibition presented more impact on oxidative changes in RBC membranes and, when CAT is inhibited, GPx appeared to shift to the membrane. It is known that GPx has the ability of detoxifying the cell from hydroperoxides, contrary to CAT, that is only capable of H₂O₂ scavenging. Our data strengthens the importance of GPx for the protection of the RBC membrane specifically.

Acknowledgments: Financial support from FCT/MEC through national funds and co-financed by FEDER, under the Partnership Agreement PT2020 (UID/MULTI/04378/2013 - POCI/01/0145/FERDER/007728) and Norte Portugal Regional Coordination and Development Commission (CCDR-N)/NORTE2020/Portugal 2020 (Norte-01-0145-FEDER-000024).

- **15376 | Evaluation of anti-Leishmania and anti-trypanosomal potential of an optimized library derived from an active lead compound.**

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Parasitic diseases such as leishmaniasis or Human African trypanosomiasis (Sleeping Sickness) continue to impose a heavy toll on human health. The small handful of treatments available to control this enormous health burden is limited by serious adverse effects, high costs, difficulties in administration and is threatened by the advancing problem of drug resistance. Market inertia in anti-parasite drug development has meant the outlook remains bleak with few new drugs exiting the drug development pipeline over the past two decades. In this context, a defined small library of chemically diverse compounds derived from a promising hit obtained in the context of a previous project were evaluated for anti-Leishmania and anti-trypanosomal potential. The new molecules were screened in vitro against *Leishmania infantum* promastigotes and *Trypanosoma brucei* and also for basic toxicity in THP1 cells. The EC50 and CC50 were determined by non-linear regression to enable the calculation of selectivity index. The compound-specific lytic activity was also determined and correlations with anti-parasitic activity performed. With the exception of one derivative that was more potent in *T. brucei* than the parental molecule, most compounds from the library retained the activity or presented inferior activity when compared to the parental compound. Importantly, there were specific modifications that abrogated the activity in *T. brucei* suggesting parasite specific compounds modifications. Further work will be performed in the most promising compounds to address their bio-availability in animal models to evaluate their potential for in vivo models of infection.

- **15380 | A chemo-sensor based on cadmium-free quantum dots for the determination of primaquine**

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Primaquine (PQ) is one of the most widely used antimalarial drugs. Considering the huge social and health burden of malaria, particularly in tropical countries, the development of simple and cost-effective methods for the determination of PQ in pharmaceutical formulations is of great need [1].

Quantum dots (QDs) are colloidal semiconductor nanocrystals frequently used as chemo-sensors in analytical applications [2]. However, its application is hampered by the toxicity of the QDs composition, namely the presence of cadmium. AgInS₂ QDs have coming out as an alternative to the classical QDs due to their biocompatibility, composition-dependent optical properties, and high biochemical stability [3].

The aim of this work was to design a chemo-sensor based on AgInS₂ QDs for the determination of primaquine. To achieve this goal, different AgInS₂ QDs were synthesized with different capping ligands, namely 3-mercaptopropionic acid and thiomalic acid. Upon the presence of PQ, the fluorescence of QDs was quenched, which was exploited to the detection and determination of primaquine. Furthermore, kinetic and time-resolved fluorescence assays were performed in order to investigate the interaction between QDs and PQ.

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[2] Rodrigues, S.S.M., et al., Application of nanocrystalline CdTe quantum dots in chemical analysis: Implementation of chemo-sensing schemes based on analyte-triggered photoluminescence modulation. *Coordination Chemistry Reviews*, 2017. 330, 127-143.

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- **15381 | Study of the influence of sterilization and isotonic agents addition on the physicochemical properties of hydrogels sensitive to external stimuli**

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Hydrophilic gels or hydrogels have a wide applicability as dermatological bases for the administration of drugs through different routes, such as ophthalmic, oral, topical, parenteral, vaginal and rectal. These systems have many advantages, such as good stability, patient acceptance, ease of production and application. The development of hydrogels using smart polymers, that is, agents that can modify their properties due to variations of external factors, such as pH, temperature, ionic strength, among others, increase drug's efficacy.

It is important to highlight that for some routes of administration, such as ophthalmic and parenteral, hydrogel-based formulations should accomplish requirements of sterility and isotonicity. In this sense, the main objective of this research project was to evaluate the effect of steam sterilization and the addition of isotonic agents on the properties of hydrogels composed of different polymers sensitive to external stimuli (sodium alginate, Pluronic® F127 and gelling PFC®). The properties of the different hydrogels, namely pH, texture and rheological behavior were evaluated to select the most suitable base for the transport of active substances for ophthalmic administration.

The results showed that Pluronic® F127 hydrogel experienced the smallest changes when submitted to sterilization at 121°C for 15 min and an improvement on its properties when added of an isotonic agent, being selected as the most promising for ophthalmic administration of drugs.

- **15382 | Follicular fluid composition: a source of oocyte quality biomarkers**

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There is increasing evidence that oocyte quality is a key to a successful fertilization. Follicular Fluid (FF) is a complex mixture of proteins, metabolites and ionic compounds, that fills the antrum of the ovarian follicle. It is produced during folliculogenesis and, among others, is rich in oxidative stress mediators. FF forms the biochemical microenvironment of the oocyte before ovulation and assists in estimating the developmental competence of female gametes. It represents a non-invasive and easily accessible source of biomarkers. As already described, the composition of FF varies among patients and can be affected by infertility-associated complications, such as obesity, polycystic ovary syndrome and endometriosis. Fluctuations on FF composition may interfere with follicular development, by affecting viability and morphology of granulosa cells, as well as cause an imbalance in ROS production. Thus, the aim of this study is to understand the impact of different FF on granulosa cells (COV434). We also intend to investigate if there are differences in thiol group levels. Thiol is a recently identified oxidative stress marker, and works as an antioxidant mechanism with critical roles in folliculogenesis and ovulation. FF were obtained from patients involved in IVF treatments. To investigate the effect of FF on COV434 cells, FF were divided in 3 groups: (a) control/exclusively male factor (n=15), (b) obesity (n=20) and (c) endometriosis (n=20). Cells were treated with 10% FBS or 10% FF. GC viability was explored by the MTT assay while cell morphology was studied by phase contrast microscopy and Giemsa staining. Thiol groups were measured by colorimetric method. The results suggest that there are no significant differences in COV434 cell viability when cultured under different FFs. Further studies are being performed to understand how FF composition is compromised by different pathologies and how it correlates with reproductive success.

- **15383 | : In silico and in vivo evaluation of new synthetic antifouling compounds**

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Biofouling is defined as the undesirable colonization of submerged man-made surfaces by fouling organisms (microfoulers and macrofoulers) and represents a major economic nuisance for the maritime industries worldwide caused by the increased weight of ships inducing over-consumption of fuel and maintenance costs [1]. The development of effective but less toxic and low bioaccumulative antifouling agents for practical use has been a priority[2]. In this work, *in silico* calculation of log Kow (octanol-water partition coefficient) was performed using KOWWINTM v1.68 program developed by Syracuse Research Cooperation jointly with the Environmental Protection Agency (EPA), in order to evaluate the bioaccumulative potential of a series of *in house* synthesized phenolic compounds inspired in natural products and *in vivo* anti-settlement test was conducted to evaluate their antifouling effectiveness. Results showed that all tested compounds exhibited low bioaccumulative potential (log Kow <3). *Mytilus galloprovincialis* adhesive larvae were used in the *in vivo* anti-settlement test and results showed that some compounds were active against the settlement of these larvae (% of inhibition higher than 75% at 50µM). Furthermore, some structure activity relationship features were possible to observe. With this study, four compounds were selected for further studies, namely environmental studies concerning ecotoxicity against non-target organisms, to explore their future as new eco-friendly antifouling agents.

[1]Wang,K.L. et al,Marine drugs 2017,15(9). [2] Almeida, J.R. et al, Scientific Reports 2017,7,42424.

Acknowledgments:This work was supported through national funds provided by FCT/MCTES-PIDDAC and ERDF through the COMPETE -POFC programme, under the project PTDC/AAGTEC/0739/2014(ref POCI-01-0145-FEDER-016793; Project 9471-RIDTI) in the framework of the programme PT2020.ARN acknowledge FCT for the PhD scholarship(SFRH/BD/114856/2016).

- **15384 | THC effect on pre frontal cortex dopamine and COMT metabolism**

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Medical and even recreational marijuana legalization are spreading worldwide and an increased interest on this plant is mobilizing new discoveries about cannabinoid properties. THC is the main psychoactive constituent in cannabis and its effects can be partially explained by its influence on dopaminergic metabolism. Acute THC administration triggers increased nerve firing and dopamine release, but long term-use is more related to dopaminergic blunting. Excessive or insufficient dopamine activity on brain tissue can be damaging for neuronal structure and there is even some evidence about how dopamine can be involved in psychosis pathogenesis. Dopamine availability in PFC is mostly controlled by COMT, a catabolic enzyme. There are different COMT genotypes, and their activity variance reflects the brain's sensibility to cannabinoids. As so, previous studies pointed a disruptive effect of THC, probably dependent on COMT genotype.

Concerning these intricate associations, we wanted to study THC effect on dopamine metabolism. We started by measuring THC effect on COMT activity in vitro and our results showed that THC did not change enzyme activity, except for higher concentrations. After that, to see how the this drug performed in vivo, we treated a group of mice for 10 days with intraperitoneal THC and compared the results to a control group. We measured several biological parameters such as body and brain weight, dopamine, L-DOPA and DOPAC plasma and brain tissue levels and COMT activity in pre-frontal brain. No significant differences were found in any of the measured parameters.

This study helped understand that THC can have some influence on COMT activity when in high concentrations, but, overall, a subacute treatment with this drugs does not produce significant changes in brain dopamine metabolism.

- 15385 | *Trioza erytreae*: Physiological studies of Citrus hosts exposed to the African citrus psyllid

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Trioza erytreae, also known as African citrus psyllid (ACP), is an emergent vector of the causal agent of the African form of citrus *Huanglongbing* (HBL) disease, or *citrus greening disease*, a very destructive disease of citrus plants, and only recently detected in Portugal. The host plants of ACP are from the Rutaceae family, preferably lemon trees (*Citrus limon*) and lime trees (*Citrus aurantiifolia*), although it can also affect other species. In Europe, it was first observed in 1994, in Porto Santo Island (Madeira) and later, in 2002, in Canary Islands. In 2014, it was identified for the first time in Pontevedra providence (Galicia) and in mainland Portugal. As of 2018, HBL still hasn't reached Portugal, however, the vector, which was first detected in Porto in January 2015, currently occurs in the North and Central regions, and has rapidly become a species of concern for various citrus producers. The deposition of *T. erytreae* eggs can cause the leaves to become distorted, galled, curled and with chlorosis, which will damage the plant's development and will affect fruit production.

The aim of this project is to collect samples of infected (with ACP nymphs) and non-infected (without nymphs) citrus leaves. A first characterization of the insects at different developmental stages will be followed by stereoscope photograph-profiling. Also, this sampling will be followed by an analysis of leaf oxidative stress during insect infestation (enzymatic assays, antioxidant capacity, MDA, CMS, etc.) by spectrophotometry, as well as gene expression, among others. This data will allow us to understand, not only the visual traits of the insect in the Center/North of Portugal, but also, how different host species of the Citrus genus react to the presence of the insect and what are its possible defence mechanisms.

- **15390 | INTEGRATED MULTITROPHIC AQUACULTURE SYSTEM (IMTA) FOR EUROPEAN SEABASS AND SEA URCHIN PRODUCTION VERSUS MONOPRODUCTION OF EUROPEAN SEABASS**

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Integrated multi-trophic aquaculture systems (IMTA) is an environment-friendly model of aquaculture production, involving the simultaneous production of fed and extractive species, recycling the wastes and converting it into valuable products. The present study aims to test the feasibility of a pilot scale out-doors IMTA combining the production of fish (European seabass, *Dicentrarchus labrax*), invertebrate (sea urchin, *Paracentrotus lividus*) and seaweed (*Ulva* sp.), comparing it with monoproduction of European seabass. Six outdoor, independent IMTA systems (2400 L) were implemented, composed by 4 tanks, in a closed recirculation system. Trial was conducted for 9 weeks, during winter conditions (October to December), under natural abiotic conditions (temperature 12°C; ranging from 6-16°C). At the beginning of the trial 2 seaweed stocking density were established, in duplicates: 2 and 3 kg/m³; fish initial stocking density was 6 kg/m³ and sea urchin initial stocking density was also 6 kg/m³. In the seabass monoproduction system, no seaweed or sea urchin were included. Fish were daily fed with a commercial diet (42%Prot;18%Lip) and sea urchin were fed two times a week with an agar-based diet (36%Pro;2%Lip). Seaweed stocking density was maintained throughout the trial. At the end of the trial, mono and IMTA seabass production was similar. Fish growth and feed utilization efficiency of monoculture production was similar to that of 3 kg/m³ seaweed IMTA system, and higher than in the 2 kg/m³ seaweed IMTA system. Sea urchin total diameter gain was similar irrespective the seaweed stocking density. Simultaneous production of seabass and sea urchin under IMTA system is feasible, providing seaweed stocking density is adequately established to guarantee maximum growth of fish. This study needs to be performed under Summer conditions to confirm its repeatability under fast growth conditions.

- **15391 | Anti- versus pro-oxidant effects of the carotenoids β -carotene, trans- β -apo-8'-carotenal and β -cryptoxanthin in a synaptosomal lipid peroxidation model**

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Carotenoids are bioactive compounds widely distributed in nature and largely present in the human diet. Various biological properties have been attributed to carotenoids, mainly credited to their ability to scavenge physiologically relevant reactive species (1). However, this property of carotenoids is not broadly accepted as some authors state that they may have a dual anti- and/or pro-oxidant activities (2).

The main aim of this work was to evaluate the anti- versus pro-oxidant effects of the carotenoids β -carotene, trans- β -apo-8'-carotenal and β -cryptoxanthin. For this purpose, rat brain synaptosomes were used as experimental model. Carotenoids were added during the synaptosomal preparation and oxidative stress was induced by peroxynitrite. The lipid peroxidation modulatory effect of the different carotenoids was assessed by measuring its widely accepted biomarker, thiobarbituric acid reactive substances.

The tested carotenoids, β -carotene, trans- β -apo-8'-carotenal and β -cryptoxanthin, under these experimental conditions, presented distinct effects on lipid peroxidation, from the inhibition to the induction. These results confirm the existent doubts about the antioxidant potential of carotenoids and indicate that more studies are needed as carotenoids may present different effects according to their structure and also according to the physiological processes they are directed to.

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2. Ribeiro D et al. Food Chem Toxicol. 2018;120:681-99.

Acknowledgements:

This work received financial support from the European Union (FEDER funds POCI/01/0145/FEDER/007265) and National Funds (FCT/MEC, Fundação para a Ciência e Tecnologia and Ministério da Educação e Ciência) under the Partnership Agreement PT2020 UID/QUI/50006/2013, and "Programa Operacional Competitividade e Internacionalização" (COMPETE) (PTDC/QEQ-QAN/1742/2014 – POCI-01-0145-FEDER-016530), and under the framework of QREN (NORTE-01-0145-FEDER-000024).

- **15393 | Effects of phenolipids on the human erythrocyte oxidative damage**

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Phenolic antioxidants are attracting a growing interest as potential therapeutic agents to counteract diseases associated with oxidative stress. Covalent modification of antioxidants through lipophilization (phenolipids) is aiming at developing antioxidants with improved efficacy. Red blood cells (RBC) are particularly exposed to oxidative damage. However, they have poor repair and biosynthetic mechanisms, suffering oxidative lesions whenever oxidative stress develops. Usually, oxidative hemolysis does not occur in great extension in healthy subjects since the cell is marked for removal before that, but it is very important in hemolytic diseases and in patients with hemodialysis treatments. Whenever the hemoglobin is released from RBCs it is potentially dangerous and play a major role in pathophysiology of cerebral hemorrhage, blast pressure injury and myocardial ischemia reperfusion injury. During this process, cells can actually "leak" to the plasma several kinds of reactive oxygen species that will cause injury to cells.

This study aimed to investigate the protective effects of caffeates with increasing liposolubility against the RBC oxidative injury. Several parameters were evaluated: inhibition of hemolysis, hemoglobin oxidation and RBC morphology. All compounds were found to protect RBCs from AAPH-induced oxidative hemolysis after 4h incubation, except for caffeic acid. In the case of the more hydrophilic (C1-C4) caffeates, this protection was dose-dependent but in the case of more lipophilic caffeates, the activity was almost concentration independent. The hemolysis studies were in agreement with the results observed in the analysis of cellular density performed by optical microscope. An increase in % of membrane bound hemoglobin (MBH) was observed in the presence of AAPH and the compounds. However, the hemoglobin analysis showed that the caffeates were able to inhibit its oxidation, so the increase in MBH is not exclusively due to the its oxidation.

- **15394 | Micropropagation of *Actinidia deliciosa* and evaluation of the pathosystem kiwi-Psa**

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Pseudomonas syringae pv. *actinidiae* (Psa) is the causal agent of bacterial canker disease on kiwifruit (*Actinidia deliciosa*). Symptoms manifest as a bacterial ooze in the trunks, leaders and canes; browning or darkening of vascular tissues; and development of wilting and blight symptoms in leaves, which may reduce fruit production. In Portugal, the bacteria occurs mostly in the Northern regions, and it has caused major losses in Spain, France, Italy and New Zealand. Bacterial canker was reported in Portugal, for the first time, in 2010 in Entre Douro and Minho regions, which are the ones with highest number of kiwi production farms. According to Moura et al. (2015), the strain found in those regions is the Psa3, which is the most virulent and responsible for the outbreak in Europe and New Zealand. As Portugal has a considerable area of kiwi production, it is of major importance to understand the Psa-kiwi interactions. In order to study these interaction seeds of cv. Hayward (*A. deliciosa*) and buds were germinated and cultivated in vitro using Murashige and Skoog medium. The aims of our project are to develop: a) kiwi to germplasm in vitro collection; b) use these in vitro plants to understand the host-Psa interactions using our Psa collection from Portuguese orchard confirmed by Duplex PCR following the EPPO guideline. . These work will allow the identification of possible resistant and non-susceptible genotypes of green flesh kiwi to Portuguese Psa strains. The pathosystem characterization could be important to identify new combat strategies or identify genes of resistance. As preliminary data we already obtained a genotype collection of cv. Hayward. This work is supported by a research project and the obtained collection is essential to the comprehension of this disease. In the meantime we will do a genotype resistance screening to Portuguese isolates of Psa.

- **15395 | Reactivity to angiotensin II in the proximal colon of rats with experimental inflammatory bowel disease**

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Background: Inflammatory Bowel Disease (IBD) alters colonic transit in part due to changes in the reactivity of colonic smooth muscle. Angiotensin II (Ang II) contracts colonic smooth muscle but information on IBD is sparse.

Aim: To characterize the reactivity of Ang II in the proximal colon (PC) of control rats and in rats with experimental IBD.

Animals and Methods: Protocols were approved by local animal welfare body and national competent authority. Male Wistar rats (8-12 weeks) were rectally instilled with a 30% ethanolic solution of TNBS (20 mg/rat) or used as controls. On day 7-8, rats were euthanized by decapitation and segments of the PC were mounted in organ baths. Non-cumulative concentration response curves to Ang II were performed. The effect of the AT1 receptor antagonist candesartan (10 nM), the AT2 receptor antagonist PD123,319 (100 nM), and of the neurotoxin tetrodotoxin (TTX, 1 μ M) was studied in segments triggered with 10 nM Ang II.

Results: Ang II contracted the proximal colon of both control and TNBS-induced rats in an equivalent concentration-dependent manner (E_{max} : 209.5 $\pm$ 26.91 mN/g vs 148.9 $\pm$ 40.01 mN/g; EC_{50} : 4.71 $\pm$ 3.24 nM vs 1.11 $\pm$ 0.36 nM; respectively; $p > 0.05$). Candesartan abolished the response in control and TNBS-induced rats. PD123319 increased the response in control but not in TNBS-induced rats. TTX increased the response in control and TNBS-induced rats.

Conclusions: The contraction caused by Ang II in the rat PC is mediated by post- and prejunctional receptors, of AT1 and AT2 subtypes in controls, but only AT1 subtype in TNBS-induced rats.

- **15398 | OVERWEIGHT AND OBESITY PREVALENCES IN EUROPEAN OLDER ADULTS: FINDINGS FROM SHARE PROJECT**

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Along the increase in longevity, the likelihood of developing chronic diseases such as cardiovascular diseases, cancer and diabetes also increases. Overweight also rises the predisposition to those diseases, making it a common public health problem. Many studies show a direct relation between a high BMI (higher than 25) and a larger probability of developing diabetes, specific cancers and cardiovascular diseases. With this study we aim to study the prevalence of overweight and obese in the European population aged 55+.

In this work, we used data from the SHARE (Survey of Health, Ageing and Retirement in Europe) project, Wave 6. SHARE is a multidisciplinary and international database of data on health, social and economic status and social and family networks of representative samples of community-based populations from 17 European countries and Israel.

From all the 68231 participants included on SHARE's wave 6, we only included the participants that answered to all the questions related to gender and BMI, aged 55 or more, resulting in a final sample of 60170 participants, being 54.9% female, with an average age of 69.2 ± 9.2 years.

According to the results, Switzerland, Denmark and Italy are the countries with lower prevalences of obesity whilst Poland, Estonia and Czech Republic have higher prevalences.

As for the overweight population, Luxembourg, France and Switzerland have the lower while Croatia, Spain and Greece have higher prevalences. Generally, 69.7% of the men and 60% of the women had BMI>25. Comparing the results by age group, 50.7% of the population aged 85+, 63.5% of population aged 75-84, 63.9 % of the population aged 55-64 and 67.8% of population aged 65-74 had BMI>25.

With this work, we demonstrated that almost 2/3 of the population aged 55+ had BMI higher than 25, which makes this population at risk for developing chronic conditions. Interventions to reduce the burden of this public health problem must be addressed.

- **15402 | Prevalence of the Disorder of the development of Motor Coordination in Adult Life.**

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Coordination Developmental Disorder (TDC) is a developmental disorder that affects motor coordination. The American Psychiatric Association (APA, 2000) cites a prevalence of 6% for children aged 5 to 11 years. The objective of the Study was to try to identify the Motor Developmental Coordination Disorder in Adult Life. There are several TDC Checklists for children, but few extend to TDC in adult life. The sample consisted of 288 participants, of whom 161♀ and 127♂ were aged between 18 and 95 years. The Coordination and Adult Development Disorders Checklist (PDCA) was used in secondary education or higher education (Kirby & Rosenblum, 2008), whose translation and adaptation to the Portuguese population was carried out by Rodrigues et al. (2018). A descriptive analysis of the data (mean and standard deviation) was made using the statistical program Statistical Package for Social Sciences (SPSS - v.23). The questionnaire identified 13 people with motor impairments 7 ♂ and 6 ♀ of these 1 was identified with Dyslexia and 1 with PDAH.

Keywords: Coordination Disorder, Adults, Prevalence, Motor Development.

- **15404 | Assessing potential in organizational context: an interview-based approach**

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This work focuses the assessment of individual potential in organizations and the development of a specific and contextual instrument, reflecting on that process. Potential is defined at CEiiA (Centre for Engineering and Product Development) as the ability of people to develop skills in an environment that values individual and collective outcomes as well as the speed with which they do so. Since this allows predicting the type of behaviors that individuals are likely to exhibit in the future, it is assumed that, when properly assessed, it is a predictor of the development of the individual capacity to adapt and solve challenges. This implies a high probability of demonstrating technical and leadership skills at the highest levels. CEiiA identifies four characteristics that translate individuals' potential: curiosity, determination, analytic capacity and engagement. Building on this, we developed a behavioral based interview, organized in the four identified characteristics, presenting episodic questions. The interview allows the survey of perceptions, feelings and actions regarding work situations associated to each characteristic, considering behavioral indicators that operationalize the dimensions defined in each characteristic. We started by reviewing literature on the characteristics referred, and then searched for instruments to assess them, noting that the available literature is fragmented and sparse. Building on the guidelines provided by the organization and the literature review, we developed seven behavior indicators that translated each of the dimensions conceptualized. Thus, we constructed the script to conduct the potential assessment's interview, identifying the presence or absence of the different indicators, and aligning it with the organization's performance appraisal system and leadership development program. The instrument was tested and reformulated when adequate and then the interviews were held. Next steps include feedback interviews.

- **15407 | Characterisation of *Solanum lycopersicum* L. type 2 metallothioneins-encoding gene subfamily expression**

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Heavy metals are highly reactive and can be toxic to living cells when present at high levels. Metallothioneins (MT) are small cysteine-rich metal chelators proteins that participate in the transport, sequestration and homeostasis of metals. In plants, there are four MT types: 1; 2; 3 and 4, which differ in their Cys-residues distribution and preferred expression profiles. This study aimed to analyze the MT2 subfamily gene expression in *Solanum lycopersicum* L. in shoots and roots of plants grown exposed to different zinc and chromium concentrations (Zn treatment 1: 0.87 mM Zn for 4 weeks; Zn treatment 2: 0.87 mM Zn for the first 3 weeks, and then to 3.5 mM for one week; Zn treatment 3: 3.5 mM Zn for one week after 3 weeks of no high Zn treatment (T3 treatment; Cr treatment 1: 2.5 M for 5 weeks; Cr treatment 2: 5 M for 5 weeks). Based on the NCBI database, five MT2-encoding cDNA sequences were retrieved: MT2a, MT2b, MT2c, MT2d and MT2e and specific primer pairs were designed. Specificity of the designed primers was firstly tested using genomic DNA. MT2a-amplified sequences were sequenced and locally compared to those retrieved from NCBI confirming the specificity of the design primers for MT2a. MT2b, c, d and e will be sequenced in further steps. By comparing the expected sizes of the amplicons with the sizes obtained using genomic DNA in PCRs, it was possible to confirm that the amplified MT2a and MT2b sequences possess no introns while MT2c, MT2d, and MT2e have a higher number of base pairs than expected, proving the presence of introns. Specific RT-PCRs were performed to verify the expression of the different MT2 family members genes in response to Zn or Cr exposure. Results showed that, in the zinc assays, MT2a, MT2b, MT2d and MT2e increased their expression with the increase in Zn concentration supplied; all MT2 subtypes raised their expression levels in all Cr assays. The results prove the relationship between heavy metal stress and metallothioneins.

- **15408 | Maternal blood pressure during the last two hours of labor and markers of autonomic activity, type of delivery, fetal sex and neonatal acidemia**

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Background and objectives: To assess the changes in maternal blood pressure during the last two hours of labor in relation with markers of autonomic activity, type of delivery, fetal sex and neonatal acidemia.

Methods: Systolic (SBP), diastolic (DBP) and mean blood pressure (MBP) with simultaneous maternal heart rate (MHR) recording were assessed in 58 singleton term pregnancies in the last two hours of labor. The following three heart rate variability (HRV) indices were calculated: mean MHR (mHR) for time domain linear analysis; low/high frequency (LF/HF) MHR to assess the sympathetic-vagal balance; and CrossSampEn to evaluate maternal-fetal HRV synchrony. Curves based on estimated marginal means with 95% Wald confidence intervals were obtained, in relation with normal versus operative vaginal deliveries, fetal sex and neonatal acidemia (umbilical artery blood pH <7.20).

Results: There was a statistically significant increase of SBP, DBP, MBP, mHR, and LF/HF, and decrease of Cross-SampEn during the last two hours of labor. Statistically significant higher blood pressure values were also observed in operative versus normal vaginal deliveries, male versus female fetuses and academic versus non-academic neonates.

Conclusions: Maternal blood pressure may be more than a conventional maternal hemodynamic monitoring tool during labor, displaying significant differences in relation with type of delivery, fetal sex and neonatal acidemia, which are consistent with markers of maternal sympatho-vagal activity and maternal-fetal synchrony.

- [15409 | Casuist revision of congenital toxoplasmosis in a tertiary hospital – report of 4 cases.](#)

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Toxoplasma Gondii is an intracellular parasite responsible for toxoplasmosis, a zoonosis with a worldwide distribution. Congenital toxoplasmosis occurs when a pregnant woman becomes infected during the gestation or when there is reactivation in an immunocompromised pregnant women of a previous latent infection. Clinical manifestations of congenital infection can vary in severity, ranging from asymptomatic infection to abortion and still-birth. There are no cases of confirmed congenital toxoplasmosis reported in Portugal and we are not aware of the complications of congenital toxoplasmosis in Portugal. In this study we aimed to describe the cases of congenital toxoplasmosis in Hospital São João in the last twenty-two years. We described four cases in this paper, two of which also showing confirmed infection of the newborn. In three out of the four cases, infants developed complications secondary to congenital toxoplasmosis.

- **15410 | How did Leonardo da Vinci's illustrations contribute to Science?**

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Scientific Illustration shapes our understanding on the natural world, reflecting the way in which it evolved. In turn Scientific Illustration has been influenced by the historical context, namely in what concerns epoch styles and available technical resources.

The Renaissance was the period when one of the most remarkable figures in the History of Art and Science lived - Leonardo da Vinci (1452-1519). His notebooks respect a large variety of subjects within the physical and natural sciences, providing powerful evidence of the breadth of his interests and achievements (Vasari, 2008). Leonardo was recognized for his important findings in Anatomy, Civil Engineering, Geology, Optics and Hydrodynamics.

Concerning Anatomy, in particular, the recognition he had for his work resulted from his understanding on what anatomical drawing should rely on. Moreover, for Leonardo, it was crucial to master the depths of the body to accurately portray its surfaces (Garfield, 1989). His anatomical drawings document his findings, namely in what concerns the mechanical functions of the skeleton and the muscular forces applied on it, and aspects of the heart, which he recognized as a muscular organ, and the vascular system. Moreover, Leonardo was one of the first illustrating a fetus in the womb. His illustrations show that his interests in Anatomy as Art were supported by scientific studies based on the dissection of human bodies (Ford, 1992).

The aim of this study is to review the main contributions of Leonardo da Vinci to Scientific Illustration and the way in which such contributions influenced the present body of knowledge in different scientific fields.

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- **15411 | Assessment of the effects of ocean acidification and warming on the swimming behavior of *Nassarius reticulatus* larvae: microscopic study of the locomotor organs**

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Ocean acidification and warming (OAW) are two of the major consequences of climate change and are affecting the behavior of many species, specially of marine calcifiers such as the gastropods. Larvae from the species *Nassarius reticulatus* (L.), a common gastropod in the NE Atlantic, was used herein to investigate the effects of OAW in their swimming ability and possible consequences on the structures responsible for such behavior - the velum and respective ciliary apparatus. Early-hatched veligers obtained by caesarean of mature egg capsules collected at the Ria de Aveiro (NW Portugal), were exposed to six climate change scenarios resulting from a full factorial experimental design of three temperature (T °C) levels (control 18°C - the mean T °C registered during the species' spawning season at the sampling site; plus 20 and 22°C - warming scenarios for 2100 (short-term) and 2200 (long-term), respectively, considering the IPCC projected increase of 0.2°C per decade) and two pH levels (control 8.1 - resembling the actual conditions at the sampling site; plus the IPCC projected decrease of -0.3 pH units by 2100 - 7.8) applied in replicate. After 14 days of exposure, the larval behavioral pattern was evaluated by automated video tracking using Zebrabox. The larvae observation on ZebraLab® software v3 (Viewpoint, France) during a period of 15 min allowed to record their individual activity (s/min) and traveled distance (cm/min). Generally, individuals under acidified and warm conditions were proved to be less active and to travel short distances, which may impact larval dispersal and survival. To understand this reduced swimming capacity, the integrity, morphology, and ultrastructure of the organs responsible for that behavior - velum and velar cilia - are being studied at ICBAS through Scanning Electron Microscopy (SEM) and Transmission Electron Microscopy.

Key words: Climate change, Gastropoda, Ocean acidification, Warming, locomotor activity

- **15413 | Micropropagated Pear-Rocha plants as a biotechnological tool to study a pear-*Erwinia amylovora* pathosystem**

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Fireblight, caused by the bacteria *Erwinia amylovora* (Burril), is a highly destructive plant disease that affects primarily plants of the Rosaceae family, which include important chain-of-values fruit orchards. Symptoms generally start to appear in early spring during flowering, following the seasonal growth development of the host. In Portugal, two major outbreaks were described, the first one was reported in 2006 on pear and apple orchards in Fundão, and the second was reported in the West region of the country from 2010 to 2012. Since then, minor outbreaks of fireblight have been reported until 2017, however, only since May 2018 it is considered present by EPPO. This disease is emergent and no efficient treatment is available. *E. amylovora* is classified as a quarantine bacteria, thus understanding the disease progression in the host and develop new sustainable antibacterial treatments is necessary. Pear-Rocha can be used as a model to study the bacteria-host relations in pears, which are far less studied than in apples. In this work, we describe the establishment of a collection of Pear-Rocha in vitro plants, derived from resistant and susceptible clones of pears. Stems collected in October 2018 were treated with fungicide and cold-treated. Disinfected stems were cut and microcuttings (1-2 node each) were inoculated on agarised modified Murashige and Skoog (MS) medium containing benzylaminopurine (BA), for implementation. In parallel, seeds were vernalized, disinfected in ethanol and bleach and then inoculated on agarised medium for germination and results are under analysis. Regenerated plants will later be used in *E. amylovora* inoculation studies. After exposing the shoots/plants to isolates of *E. amylovora*, a physiological evaluation of the host response will be assessed. With this, the aim is to better understand how this bacteria affects pear orchards of the 'Rocha' cultivar with different levels of susceptibility.

- **15420 | Murine Double Minute 2 characterization in Epstein-Barr Virus associated Gastric Cancers**

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Viruses are responsible for about 15-25% of all cancers, being Epstein-Barr Virus (EBV), present in more than 90% of the world population, one of the most significant.

Gastric cancer (GC) is the 5th most common cancer, with the 3rd higher mortality rate worldwide in both genders. In Portugal, 2885 new cases and 2275 deaths due to GC are predicted this year. A recently published classification on GC from The Cancer Genome Atlas group, includes a subgroup of tumors positive for Epstein-Barr Virus (EBVaGC) which had distinctive features from other gastric cancers.

Recent reports, including one from our group, shows that EBVaGC corresponds to 10% of all GC cases and is characterized by a distinct viral latency profile. Furthermore, it has been shown that EBVaGC has no TP53 mutations, nevertheless, in a recent study from our group, we have shown a low level of TP53 mRNA but higher levels of p53 protein when compared with non-EBV associated cancers. This pattern of p53 expression is not well understood and some authors refer that the Murine Double Minute2 (MDM2) protein, p53 major negative regulator, may explain the abnormalities of p53.

In this study we aimed to clarify the activity of MDM2 in p53 deregulation in EBVaGC. Therefore, we will study a group of EBVaGC and EBV-negative GC cases from Portuguese Oncology Institute of Porto (IPO Porto). DNA and RNA were extracted from tumor tissues collected from formalin-fixed paraffin-embedded tissue blocks.

We will study MDM2: 1) single nucleotide polymorphism (SNP209) at the promoter region by polymerase chain reaction (PCR); 2) protein expression levels by two-step real-time PCR; and 3) assess the protein levels accumulation in the cancer tissue by Immunohistochemistry using a specific monoclonal antibody.

Results will allow to clarify if MDM2 is taking an active role in p53 de-regulation in EBVaGC contributing for a better knowledge of the carcinogenesis of this cancer and for better definition of future treatment options.

- **15427 | Increasing diversity of carbapenemase-producing Enterobacteriaceae in a Portuguese hospital raises awareness towards prevention and monitoring**

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To understand the dynamics of carbapenemase-producing Enterobacteriaceae (CPE) in healthcare settings is of high priority. In a Portuguese hospital, the first outbreak of KPC-3-producing *K. pneumoniae* occurred in 2015 by ST147-K64. Despite the infection control measures applied, CPE increased throughout time. Considering epidemiological, molecular and clinical data, we aim to identify critical factors for CPE spread.

119 confirmed CPE isolates from 113 patients were analysed (n=85 faecal colonization, n=34 clinical, November 2017-February 2018). Carbapenemase production was confirmed by Blue-Carba, PCR/sequencing. Isolates' relationship was determined by Fourier Transform Infrared spectroscopy and wzi sequencing for capsular (K) typing, and MLST. *E. coli* phylogenetic groups/ST131 were identified by PCR.

Medical (43%) or surgical (29%) units were the most affected by MDR CPE producing mostly KPC-3. *K. pneumoniae* (Kp) was predominant (82%), especially the initial ST147-K64 outbreak clone (51% Kp) currently distributed in all wards. An emerging ST392-like KL27 clone (19% Kp) was detected recently in medical units. These and other diverse Kp (e.g. K9, K19, K23, K31, KL105, KL112) were colonizers/infection isolates. Non-Kp CPE from diverse species (18%, including *E. coli* B2-ST131) producing KPC-3 or OXA-48/VIM were also identified but they did not disseminate. Most patients (79%) became colonized during hospitalization, and most infected patients (86%) were previous colonized (0-421 days, mean 44 days). De novo carriers (51%) had long hospitalizations (68%, >14 days) and previous antibiotic exposure (95%).

These data highlight the successful spread of ST147-K64 and a diverse CPE population contributing for carbapenems resistance, where nosocomial acquisition and previous colonization are risk factors. The data also raise awareness to the need of revising and monitoring infection control measures and emerging clones.

- **15431 | MEDIEVAL BEASTS AND WHERE TO FIND THEM - THE EVOLUTION**

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Animals are part of our lives since Man first started to walk on this planet. From our cat we pet every day to the deadliest shark in the ocean, all of them are at least briefly known and described at some degree in scientific literature.

The Middle Age was when the first descriptions of the animal kingdom started to appear. Although, at the time, they were not made for educational purposes (to some extent). Instead, they were described and illustrated for moral, religious and entertainment means.

Illustrating animals was a challenge, especially if the illustrator could only rely on what he was told the animal looked like and was not able to see for himself. This led to the description and illustration of oddly shaped and even non-existing beings - beasts.

The Bestiaries were books that compiled illustrations and written descriptions of not only real animals, but also imaginary ones that were feared and thought to be real.

It is important to see how the illustration of the real animals has come a long way since the Middle Age. From the simple black and white, with lines, few details and lack of volume to the almost photographic drawings we see nowadays.

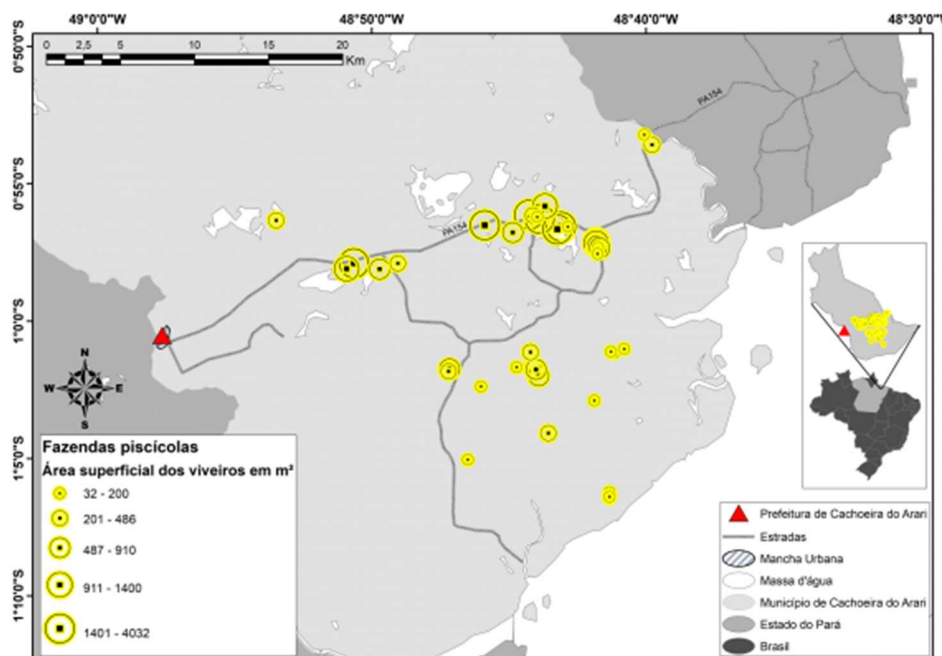
In this project, those differences will be highlighted and further explored from an artistic and scientific point of view, to better explain the importance of these books in our contemporary scientific knowledge.

- 15432 | THE PISCICULTURE IN THE MUNICIPALITY OF CACHOEIRA DO ARARI, MARAJÓ ARCHIPELAGO, EASTERN AMAZON, BRAZIL

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Aquaculture is an activity of growing organisms whose life cycle, under natural conditions, occurs throughout or in aquatic environment. Fish farming is practiced in all states of Brazil. In the state of Pará continental fish farming predominates, practiced in several municipalities of Pará. The objective was to establish the profile of aquaculture practiced in the municipality of Cachoeira do Arari, with the purpose of diagnosing the level of development of the activity, characterizing the aquaculture enterprises. The study was carried out on the Island of Marajó, forming a group of islands, which together constitute the largest fluvial-maritime island in the world, with 16 municipalities. The city of Cachoeira do Arari presents an estimated population of 22,449 thousand inhabitants in 3,100,261 km² of territorial extension, its economy is based on the creation of buffalo cattle as well as on the artisanal fishing and the sale of fish and seafood. 45 fish farmers were interviewed. The data was organized in excel and plotted in the software. The level of development of the family fish farm of the Municipality of Cachoeira in Marajó was considered low, out of a total of 38,761 hectares; the practice of fish farming, for the most part, is carried out by men who have a primary profession of artisanal fishing; The degree of schooling is not a determining factor in the growth of fish farming in the municipality. One of the main research parameters is the location of agriculture in relation to the input structure for the production and production of farms. The lack of information on the characteristics of fish farming practiced in the past makes it impossible to compare it with a current situation. Effect of a profile, becoming essential to this status, incorporating information on economic growth; social and structural the farms of the city, aiming at one of the ways to carry out the exercise of fish farming in the region.



Thematic map of the relationship between interurban access routes with nursery surface area.

- 15433 | Anthropometric assessment in hospitalized elderly people: weight and height estimation

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In the elderly population, it is not always possible to evaluate weight and height and it is necessary to use estimated values. The main aim was to compare anthropometric measurements with estimated values in hospitalized elderly patients and to evaluate inter-rater variability. Body weight(kg) and height(m) were evaluated, BMI was calculated, the knee-heel height (KH) was measured as well as the ulna length (UL), waist circumference (WC), arm perimeter (AP) and geminal perimeter (GP) by three evaluators. A total of 63 patients, 35 men, with an average age of 75 years and with a BMI of 26.8 kg / m² were included. Statistically significant differences were observed between measured weight and estimated weight according to *Rabito et al*, in both sexes and according to *Chumlea et al*, in only men. In for height, there were only statistically significant differences among women, between the measured height and the estimated heights by the *Chumlea et al* and KH formula. Despite the differences, the correlations are moderate to strong and with statistical significance, except for the estimated height in women according to *Chumlea et al* and UL. Comparing anthropometric measurements KH, UL, WC, AP, GP collected from inter-raters the statistically significant differences are in KH ($p = 0.012$), AP ($p < 0.001$) and WC ($p < 0.001$). There were no statistically significant differences between the evaluator 1 and 3 in the KH measurement and between the evaluator 2 and 3 in the KH, WC and AP measurement. Further studies with other methodologies are necessary to estimate weight and height and to correctly classify nutritional status. It is essential that the evaluators are properly trained so that the measurement error is as small as possible.

- **15436 | The Evolution of Palaeontology Illustration**

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Like Art reflects Culture, Scientific Illustration reflects the findings of Science. Science illustrators are artists devoted to Science and, in their work, they must always strive for accuracy and communication. Palaeontology illustration is one of the many fields of Scientific Illustration. From the beginning, there have been depictions of vertebrates, invertebrates, plants and even environments. Whatever the illustration created, artists and scientists worked together to produce a scientifically accurate image.

In the 15th and 16th centuries, artists were mainly concerned with realism and, by the 19th century, an additional focus was the experimentation of innovative illustrative techniques. Scientists and publishers wanted to provide informative and accurate illustrations: they used colour, high-quality printmaking processes, and even photography.

Palaeontology is deeply connected to Art and Illustration. Indeed, illustrations existed even before the establishment of Palaeontology as a scientific field. In time, palaeontology illustration evolved to become more realistic and detailed. Furthermore, scientific illustrators have always experimented by using new visual media. While such new media became used in palaeontology illustration, artists and scientists never drifted from their initial desire and goal: to be accurate and detailed in their work.

The aim of this work is to provide a general picture on the evolution of palaeontology illustration, namely in what concerns the used media and its goal in Science Communication and Divulcation.

- **15437 | Global biodiversity monitoring databases – new opportunities for macroecological research in the Anthropocene**

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Many biodiversity monitoring studies have been made over the years in different spots around the world, in different ecosystems and with different methods. Through substantial networking and harmonization efforts, the gathering of this information is now possible through databases like BioTIME, helping to capture short and long-term species and communities' temporal changes on a global scale. Despite this, the potential of this database has not yet been fully explored. Therefore, we aim to evaluate the potential of the integration between BioTIME monitoring datasets with satellite time series aiming to develop a more precise understanding about the effects of disturbances (of human or natural sources) on ecosystem structure and functioning. With this study, we want to bring the scientific community a new range of possibilities for a better understanding of the human impacts on ecosystems and its effect on biotic populations and communities. Our approach started by selecting those datasets that provide the best characteristics in terms of the analysis period, temporal continuity and spatial detail. To ensure a suitable overlap with satellite time series from platforms such as Terra/MODIS or Landsat (frequently used in biodiversity research), datasets must have completed at least 5 continuous years of species monitoring, the starting date can't be before the year 2000 and they must belong to the terrestrial domain. Following this pre-selection, the reference literature of each one of BioTIME monitoring studies was reviewed for a deeper analysis and classification. After completing this selection stage, we evaluated the spatial and temporal characteristics of the studies with GIS software. In a final step, we combined all the information gathered from the BioTIME database with satellite time series of ecosystem dynamics and made a final analysis and modelling of this combining potential. Results are expected to improve further studies in biodiversity.

- **15438 | The becoming of the school autonomy and the acknowledgments of democratic management in the Escola da Ponte.**

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This research aimed to know the configurations of democratic management of education and the relationship between normative designs and practices of school autonomy experienced over time, in Brazil and Portugal.

Our main objective was to understand the possibilities of articulation between the legal and the educational, bringing the legal interpretations closer to the real demands of the subjects in the local educational communities, through the mobilization of the device of the contractualisation of school autonomy.

The theoretical and epistemological framework was based on studies that place education as a right, acknowledge the fundamental role of democracy in the construction and consolidation of democracies, challenge the reinvention of social emancipation, and search for ways of unraveling the intersections and disjunctions between these two components of organization and transformation of societies.

Through the analysis of school autonomy in Portugal, we seek to assimilate the debates that accompanied its historical-organizational course and its critical process of implementation, development and consolidation, accompanying a plethora of authors and visions about the two decades of contractualisation of school autonomy and mapping the current stage of use of this instrument.

We call for an autonomy that enables schools to promote a humanistic and dialogic education, insurgent to the reductions that confine them to administrative services.

We adopted the qualitative view and the phenomenological-interpretative paradigm, in the light of which, a case study was carried out at Escola da Ponte, the first Portuguese educational unit to sign a contract for autonomy.

The research has led to the perception that there are spaces for the increase of a more emancipatory hermeneutics at the service of school autonomy and its juridicity, for the claim of the right to democratic management in education.

KEY WORDS: law and education; Democratic management; school autonomy.

- **15442 | Comparative study between nutritional risk assessment and nutritional status evaluation in Internal Medicine inpatients**

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The older adults undernutrition in hospital admission happens very frequently and the early nutritional intervention is fundamental. The goal was to relate the nutritional risk with the assessment of the nutritional status and characterize those who need or not nutritional/food intervention, in a sample of older adults admitted in an Internal Medicine department. In 555 inpatients (63,6% women) was collected data of nutritional risk (MNA-SF), age, physical exam, BMI and analytical parameters and need/type of nutritional/food intervention. The average age was 81,3 years and BMI of 26,6 kg/m². According to MNA-SF, 25% were undernourished, 47% at undernutrition risk and 28% without risk. Was found muscle/fat depletion moderate/severe in 70,2% of the screened as undernourished, 26,7% at risk of undernutrition and 15% of the without risk. The BMI was <23kg/m² in 62% of the undernourished, 23% of the at-risk and in 14% of the without nutritional risk. Only 64 inpatients had albumin >35 g/L. 54% of the sample had nutritional/food intervention. The biggest undernutrition risk is associated with highest fat/muscle depletion, and PCR and smallest score of MNA-SF, BMI, hemoglobin, albumin and total protein (TP). Inpatients with highest number of interventions were younger, with higher fat/muscle depletion, lower values of BMI, hemoglobin, albumin and higher TP and PCR. We verified that inpatients screened as without nutritional risk presented a physical exam, BMI and analytical parameters that classify them as undernourished, requiring proper nutritional intervention, in another hand, some patients despite being screened as undernourished didn't need nutritional intervention.

- **15444 | Wear behaviour of TiC and WC - white cast iron composite fabricated by in situ technique**

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The ferrous alloys locally reinforced by carbide particles are promising materials for wear resistance applications, due to low processing costs and increased castability. The local reinforcement provides high wear-resistance while the bulk cast iron offers high strength and toughness. For this reason, this grade of material is of increasingly importance in the oil and gas and mining industries. Considerable attention has been directed towards the in situ and ex-situ techniques for the reinforcement phase (ceramic-metal composite) is directly formed during in-situ casting or, alternatively the ceramic particles are previously fabricated by ex-situ methods and incorporated into molten cast iron. The combination of in-situ or ex-situ techniques with traditional casting process, offers an economically attractive route in fabricating net shape metallic components locally reinforced. This work characterizes the wear resistance of cast white iron components locally reinforced with a TiC and WC-Fe composites by ball-cratering abrasion tests and hardness tests. To understand the effect of local reinforcement on the material performance, the microstructure of the composites is characterized by SEM/EDS. In respect to the TiC system, the results show a non-uniform distribution of TiC particles in the reinforced matrix. The average hardness of the metal-ceramic composite is 749 HV 30, which means an increase of 26% compared to the hardness of the base metal. Regarding the WC system, the results show a homogeneous and random distribution of the WC particles in the reinforced matrix. Also, it is observed a reaction layer that should guarantee a strong bonding between the base material and the reinforced zone. The average hardness of the metal-ceramic composite is 612 HV 30, which means an increase of 24% compared to the hardness of the base metal. In both reinforcement systems, the microscopic analysis shows a good infiltration of the base metal into the reinforcement zone.

- 15445 | Characterization of the microbial community and physical-chemical elements of a water recirculation aquaculture system

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The global population growth in the last decades increased the consumption of animal protein. According to FAO, this protein demand causes depletion of natural fisheries and consequently aquaculture grown at an impressive rate. It is now an essential industry that makes fish and seafood more accessible to consumers around the world. Recirculation aquaculture systems (RAS) are characterized by being economic, environmental-friendly and efficient. Although, they also create favourable conditions for fish disease occurrence and stress conditions caused difficulties in controlling water quality. Moreover, the *Tenacibaculum maritimum* pathogenic bacteria is one of the principal reasons for the reduction of the stock in Sole aquaculture facilities, causing ulcers and leading to the death of the specimens and representing a huge economic risk. This study aims to monitor the microbial and physico-chemical parameters of the different compartments of a RAS system in order to understand the vulnerability of the different aquaculture compartments to the occurrence and/or proliferation of microbial opportunists. To accomplish this objective, diverse analyses were performed in the different RAS compartments: microbial community analysis in water and in fish (*Solea senegalensis*) samples at different development stages; physico-chemical water analysis. Microbial community analyses will be performed also in rotifers and artemia cultures that serves as live feed. In this communication, it will be shown the results of this first phase, in which it was demonstrated the presence of the pathogenic bacteria *Tenacibaculum maritimum* in various compartments of the RAS system through PCR and NGS analyses.

- **15448 | Interactive fiction: The potential of the game-book in different literary contexts**

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The Ministry of Education and Science considers learning literary contents one of the biggest part of the the Portuguese Language subject. Despite the reformulations in the Curriculum Goals and, the adjustment of the program, the students' difficulties in understanding texts continue to be visible. It is possible to verify that the interpretation of the student is conditioned, and can lead to serious knowledge gaps as an individual inserted in a society. Faced with such reality, which has been pointed out and discussed by the teachers at the moment of evaluation, it is necessary that the students maintain an early contact with different vocabularies and new ways of exploring literary contents. Thus, activities needs to be carried out in a classroom context, according to external factors of the school and with the help of the Teacher, are being presented as one of the ways to guarantee better results in the final moment of evaluation. Despite some considerable progress in overcoming learning-related difficulties, teaching has not yet taken sufficiently advantage from the benefits of new technologies. The appearance of interactive narratives and videogames, presented visible changes in the routine of the individual. The use of serious games, for example, has been recognized and adapted to encourage and encourage people to perform tasks. In sum, this work intends to find research lines for the creation of a tool capable of narrating and disrupting literary contents and, essentially, of motivating and supporting a preparation course for the national exam, bearing in mind the complexity of these new instruments. The evaluation and development are done with a control group composed of students and teachers, usability tests and recurrent methodologies to User-Centered Design to correspond directly to the requirements of the target audience.

- **15451 | Visual Behavior in Elements of Balance and Rotation in Rhythmic Gymnastics**

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In GR, as in other sporting modalities, several motor skills are requested, so that the correct execution of the elements that compose the competition exercise is possible. These elements are divided by: Body Difficulty (BD), Combination of Rhythmic Steps (S), Dynamic Elements with Rotation (R) and Difficulty of Apparatus (DA) (FIG, 2017). The exercise groups that are part of the Body Difficulty are jumps, balances and rotations (FIG, 2017). For this study, we will use some elements of balance and corresponding form in rotation element to analyze the stability of the technique and the influence of the visual behavior of the gymnast in the execution of the evaluated elements. Our sample is composed of 9 gymnasts from 11 to 15 years. We also have a control group of girls at the same age group as the gymnasts and who will not be practicing sport. The kinematic variables are collected by means of a Qualisys motion capture system (Qualisys AB, Sweden). In conjunction with the collection of kinematic variables will also be using the eye tracking equipment that has been used in research for ocular tracking (Cardoso, 2014). It will be used 4 corporal forms of element of balance being: the passé front, side split with support, ring with support and penché. In addition, we will also have the pivots that correspond to the same forms of the balances, being: pivot passé, pivot side split with support, pivot ring with support and pivot penché. As the project has as objective to observe the visual behavior, was chosen two foci of vision, being one ahead, on the horizon line so that the gymnast keeps her gaze forward and another focus below the horizon line, causing the gymnast to direct her gaze downward. In the data collection, 5 attempts will be made to focus on the horizon line, that is, with the forward look and 5 attempts with the look down, totaling 10 attempts to each task of each element.

- **15454 | Flavonoid composition and antidermatophytic effects of an hydroalcoholic extract obtained from the leaves of *Salacia senegalensis* (Lam.) DC.**

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The incidence of microbial infections is increasing mainly due to the growing number of immunocompromised individuals, as well as other “at-risk” patients with circulatory and metabolic disorders such as diabetes mellitus. Prior meta-analyses demonstrated a higher hit rate for antifungal activity with plants reported for their ethnomedicinal use in the treatment of skin infections with an obvious pathological expression. As such, an extract obtained from the leaves of *Salacia senegalensis* (Lam.) D.C. was selected and evaluated for its efficacy against a panel of fungi responsible for systemic and superficial diseases, including also the bacterial pathogens *Staphylococcus aureus* and *Escherichia coli* due to their high incidence. Following a standardized definition of “active”, considering MIC values $\leq 1000 \mu\text{g/mL}$ as relevant, the hydroethanolic extract was active towards the dermatophytes *Trichophyton rubrum* and *Epidermophyton floccosum*. Since the inflammatory response triggered by the presence of the fungus or release of its metabolites/virulence factors also plays a role in tissue damage, assays were geared towards the evaluation of the anti-inflammatory ability. Strong inhibitory effects towards 5-lipoxygenase were observed upon treatment with the extract obtained from the leaves of *S. senegalensis*, with an IC₅₀ value of 71.1 $\mu\text{g/mL}$, proving also to significantly reduce NO levels in LPS-challenged RAW 264.7 macrophages at 2 mg/mL . HPLC-DAD analysis allowed to identify myricitrin (1) and the three mono-O-glycosyl quercetin derivatives isoquercitrin (2), quercetin-3-O-xyloside (3) and quercitrin (4), 4 being identified as the main constituent.

Acknowledgments: This work received financial support from National Funds through the project UID/QUI/50006/2013, through the European Regional Development Fund (ERDF) (project NORTE-01-0145-FEDER-000024 and Strategic Funding UID/Multi/04423/2013) and from project 0377_IBERPHENOL_6_E.

- **15456 | Spatial distribution and ecology of free-roaming cats (*Felis silvestris catus*) in an urban environment (Lourosa, Portugal)**

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Free-roaming cats (*Felis silvestris catus*) include the domestic ones, stray cats and feral cats. Stray and feral cats usually live either solitarily with a territorial pattern or in groups with different social structures and in different numbers. While domesticated cats are one of the most widely distributed mammals around the world, as they have great adaptability to different types of environments, there are few studies regarding their behavior and ecology in Portuguese urban areas. Such studies are important for a better understanding of their behavior and impact on urban areas, as well as for management purposes due to possible public health concerns. This study aims to understand the spatial distribution and ecology of free-roaming cats and cat colonies in an urban city, estimate the cat population size and characterize the colonies found.

For this study, a 0.82 km² area in the city of Lourosa, Portugal, was selected. Monthly observations are being conducted, each area being observed during three different periods of the day. Each observed cat is photographed and its location, sex and behavior is registered. Environmental data of the study area (feeding spots and shelter) are also registered and habitat characteristics (buildings, roads, green spaces, agriculture and shrub) are being determined.

So far, 55 different cats have been sighted and the location of two possible cat colonies have been identified. Our preliminary results point out to a wide distribution of cats, but they tend to be near residential areas and cat colonies prefer to stay close to feeding spots. Cats observed alone or in small numbers are scattered in busy areas and in less populated areas. They also seem to avoid major traffic roads.

Additional data is needed for a better understanding of the cat populations and their distribution in the selected area. Studies like this are needed to help analyze and implement successful programs to control and maintain these populations.

- **15457 | Iron ore Life Cycle Assessment**

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The present work main goal is to study the Portuguese mining sector, through selecting iron ore as a case study and applying the Life Cycle Assessment [LCA] methodology.

The mining industry is a key industry for the maintenance and development of today's society. LCA allows a detailed analysis of all the steps of the economic cycle in the mining process to obtain the final product. The product under consideration is iron ore. In Portugal, its exploitation took place between 1949 and 1970 (Campo Cova do Marão, North of Portugal) with a total of 448800 ton of Fe extracted. At this mining site there are 14 Mt of Fe. Currently, 550 Mt Fe reserves are defined and proven in the Moncorvo deposit, north of Portugal, thus representing a high exploitation potential. Currently, the Moncorvo deposit can be considered one of the largest at European level.

Final remarks are carried out through a SWOT analysis, identifying opportunities and threats of the iron ore within the Portuguese mining industry in a general context of strategic objectives of the industry.

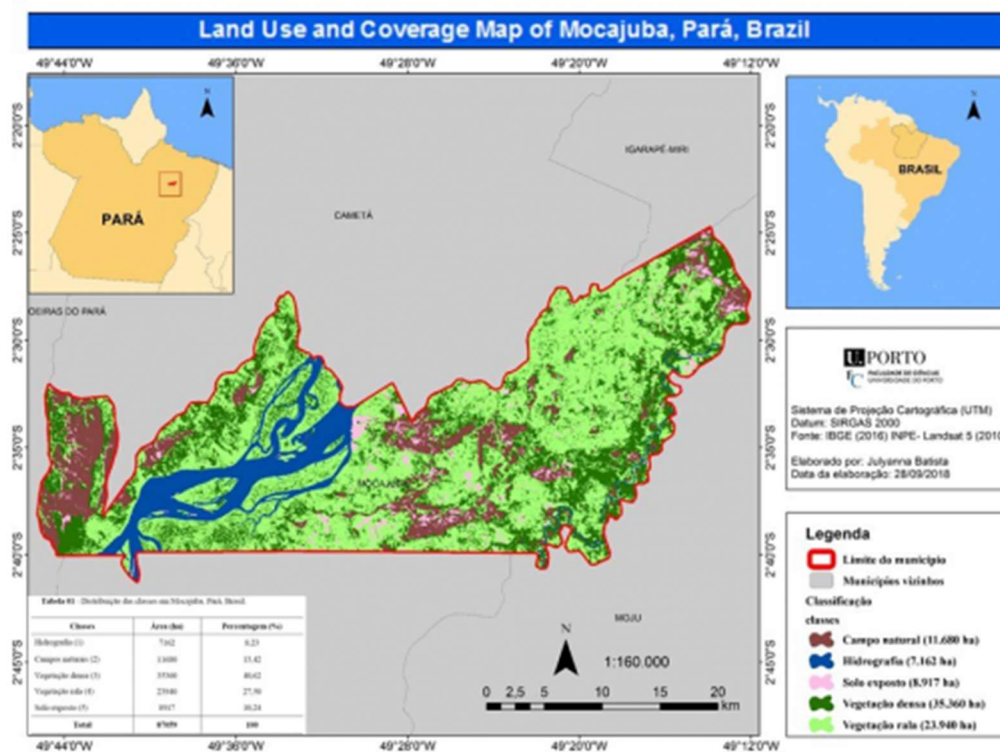
- 15458 | CHARACTERIZATION OF THE USE AND COVERAGE OF SOIL IN THE MUNICIPALITY OF MOCAJUBA, PARÁ, BRAZIL.

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The Amazon is formed by an enormous heterogeneity derived from its ecosystems and forms of occupation, becoming a great diversity of spatial configurations, because of the variation of each region and the anthropic modifications in the earth, there are significant differences in the landscape according to the time, then, the remote sensing tool can be used to analyze such changes. The objective of the study was to characterize spatially the land use and occupation in the municipality of Mocajuba, belonging to the State of Pará, through the satellite LANDSAT 5 / TM combined Geographic Information System (GIS). The classification was of the unsupervised type, where the maximum likelihood method was used, and five classes were determined: Hydrography (1), Natural fields (2), Dense vegetation (3), Sparse vegetation (4) and Exposed soil. Arcgis 10.3 software was used in all spatial analyzes. The largest classes were dense vegetation, sparse vegetation and natural fields. Thus, it can be concluded that, the study expressed a spatial understanding of soil occupation in the municipality of Mocajuba, where the class of dense, sparse vegetation and natural field was highlighted. The GIS proved to be a management tool applicable to the context.



Land Use and Coverage Map of Mocajuba, Pará, Brazil

- 15459 | Did no-till cropping practices minimize the effects of groundwater salinity in Estarreja's agricultural region?

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In the municipality of Estarreja, Center of Portugal, agricultural activity occupies 54% of land and farmers rely on the groundwater as the main source for irrigation. However, groundwater resources are under pressure due to salinization, nitrates, chlorates and organic and inorganic contaminants, which are associated with the industrial activities and particularly with the "Estarreja Chemical Complex". The irrigation was expected to contaminate the soil, increasing its salinity, and contributing to the loss of ecological functions. Thereby, new and appropriate farming practices may help to minimize the impacts of irrigation. Over the last few years, no-till (NT) farming showed several advantages to enhance soil quality, such as the increase of organic matter, the improvement of soil structure, and the decrease of soil salinity. Thus, the main aim of this study was: i) to evaluate the ability of NT agriculture to minimize the impacts of irrigation with salinized groundwater on soil and maize plants (*Zea mays* L.) and, ii) to compare NT effects with those of current agricultural system (till agriculture). For this purpose, the soil was seeded with *Trifolium repens* L., which, after decaying, was left on the soil surface (NT) or incorporated (T); after this, *Z. mays* was seeded and grown for 14 days. Soil physical-chemical and biochemical (enzyme activities) properties, plant biomass and physiological parameters, and soil elutriates toxicity, were assessed. The gathered results indicated that groundwater irrigation significantly increases soil's salinization in both farming systems, caused oxidative stress and significant plant growth inhibition. However, NT practice seems not to be enough to reduce the damage in soils and cultivated plants. The results also encourage the urgent need for studies to mitigate the negative biological impacts of irrigation practices in Estarreja.

- **15460 | Cat (*Felis catus*) colonies in Porto urban environment**

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Cat colonies in urban environments are motivating increasing solidarity events and awareness campaigns focusing on street animal life conditions. This is associated with the need to prevent/reduce cat colony proliferation through sterilization campaigns and at the same time with appeals directed to the general public to the importance of avoiding street animal feeding; in spite of these efforts, there is still a large number of cats/cat colonies feeding on artificial food sources (garbage/cat lovers handouts) in many cities around the world. Cats have an adaptative behavior to the environmental conditions; their life is molded and adjusted by resource distribution, mating opportunity and descendent caring. This work aims to better understand urban cats and namely what are the main factors that affect cats and cat colonies in urban environment.

Three semiferall cat colonies in the city of Porto were selected for our study. The characteristics of each colony (number of cats, their sex and interactions) are being analyzed. Each month the colonies are surveyed during three different occasions (morning, afternoon and evening); all cats are photographed to build a colony database.; the behavior of each individual is also recorded. Habitat characteristics, and human interference are also recorded.

Although the three colonies are artificially fed, they differ on their size. Although data is still scarce, the available habitat size seem to be an important factor. Human activity in the vicinity of the area might also influence colony size.

The results are still preliminary, but there's an indication towards the possibility that the cats' routine is adapted by food availability and so is influenced by human activity. It also may be pointed out that there appears to exist a strong connection between cat colonies location and human feeding spots and these colonies are located near areas with less traffic and with available shelters.

- **15464 | EVALUATION OF MASTER SWIMMERS THROUGH THE CRITICAL VELOCITY TEST: AN ONGOING PROJECT**

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On the swimming training process, swimmers evaluation and training control are fundamental tools to analyse swimmers evolution. Among a number of described and validated tests, there is a non-evasive and easy to apply method that appeared on the 1990s (cf. Wakayoshi et al., 1992) aiming to assess the maximum swimming speed that can be maintained for a long period of time without reaching exhaustion - the critical velocity test. Critical velocity is a good indicator of the individual anaerobic threshold (Fernandes and Vilas-Boas, 1999) and is given by the slope of the regression line between the tests distance and respective times. Both tests must be performed at maximal intensity and one should be of short duration and the other longer than 15 min (Wright and Smith, 1994). Critical velocity values allow, in one hand, the regulation of the aerobic capacity training series (controlling if swimmers are below, at or above their anaerobic threshold) and, on the other hand, observing the evolution, stagnation or decrease of the swimmers aerobic conditioning throughout the season. As a training season of master swimmers (subjects older than 25 years old) is usually divided in three macrocycles, each one containing general, specific, competitive and transition phases, this project aims observing if critical velocity suffers significant alterations with different training loads. Sixteen swimmers of 26 to 60 years old, training at least three times per week, will be tested on the final of the above-referred training phases. Critical velocity will be assessed using 200 m and 600-800 m (depending on the training level of the subjects) and related with the volume (in km) and intensity (in arbitrary units) of the training load.

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Wakayoshi K et al (1992). Eur J Appl Physiol 64, 153-157.

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- **15466 | Glycosylation and functional analysis of glycoproteins in gastric cancer**

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Gastric cancer is the 5th most common cancer worldwide and 3rd leading cause of cancer related deaths. Gastric carcinogenesis and cancer progression are accompanied by profound changes in the cellular glycosylation machinery, resulting in the expression of aberrant glycan structures by gastric cancer cells.

In this Master's project we are aiming to evaluate the glycosylation profile of key glycoproteins in gastric cancer. To achieve this goal we are going to apply a large array of complementary methods and new approaches. This will allow us to evaluate the glycosylation status of the target glycoproteins and assess the functional impact of the altered glycosylation. Specifically, we are applying genetically modified gastric cancer cells that express various cancer associated glycan epitopes. We are analyzing these models by immunofluorescence and flow cytometry. Key glycoproteins are then evaluated by immunoprecipitation and western blot. Finally, we are corroborating our results in gastric carcinomas of patients using an innovative approach of proximity ligation assay and immunofluorescence that allows us to assess the aberrant glycosylation, as well as the colocalization of key glycoproteins in situ.

- **15469 | T cell polarization influences the development of IBD-associated neoplasia**

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Inflammatory bowel disease (IBD) is characterized by chronic relapsing inflammation of the gastrointestinal tract. It is an example of the widespread concept that chronic inflammation is a cancer risk factor since patients have an increased risk of colorectal cancer. Classically, this association has been explained by the establishment of an inflammatory environment that favors cell proliferation, angiogenesis and, ultimately, neoplastic risk. We hypothesize that, besides inflammation itself, the polarization of T helper (Th) cells towards branches that are pro or anti-inflammatory is an important cancer risk factor in chronic inflammation, namely IBD, and that Th1 cells are pro while Th17 cells are anti-inflammatory in this setting.

To recapitulate tumor development in the context of chronic inflammation we used the azoxymethane and dextran sulfate sodium (AOM+DSS) chemical carcinogenesis mouse model. Cytokines produced by each of the cell subsets - IFN- γ for Th1 cells or IL-17F for Th17 cells - were administered to the AOM+DSS treated C57BL/6 mice to polarize inflammation into the two different types of response. Tumor number and area were quantified macroscopically and tissue was collected for histological analysis and for immunohistochemistry against CD4 and CD8.

The cytokine treatment influenced neoplasia development. Macroscopically, IL-17F treated mice had more lesions than IFN- γ treated mice (μ = 12.9 lesions vs. μ = 5.4 lesions, $P=0.004$), with a stronger impact in females. Histologically, only 33% of IFN- γ treated mice had neoplastic lesions. That number was higher in both the control group (67%) and the IL-17F group (83%), although not significantly. No differences were observed in the tumor CD4+ and CD8+ cell densities between the groups.

We confirmed that polarizing the Th cell immune response influences tumor development. Polarization towards a Th1 phenotype decreased tumor number, whereas polarization toward a Th17 response increased that number.

- **15472 | COMPETING COUSINS: ASSESSING CONTACT ZONES AND PHYLOGEOGRAPHY OF DIVERSE PODARCIS VAUCHERI LINEAGES WITHIN MOROCCO**

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D. James Harris, CIBIO-InBIO, Portugal

As genetic tools advanced over the last years, their use became both widespread and relatively cheap. This led to an intensification of their application on the research of biological patterns and processes, which in turn resulted in the identification of exceptional levels of diversity across many taxa - namely, within many reptile species.

This is particularly true for the Iberian and North African *Podarcis* wall lizards. Whereas only two species were originally considered within the species complex, there are now at least seven that have been elevated to that level.

However, though those many mitochondrial lineages have been recognized as different species in Iberia, the North African/Southern Iberia lineage is still considered a single form, *Podarcis vaucheri* (Boulenger, 1905). Despite this lack of formal clarification, at least one other lineage, highly genetically distinct from its peers and closer to the Tunisian ones, has been found almost two decades ago, isolated in the Southernmost part of the genus range, in Jebel Sirwah, Morocco. A hypothesis has been presented that the widespread *P. vaucheri* may have spread from either Iberia or West Africa and displaced this other lineage, but this has not been tested. Moreover, very recently there have been identified additional populations of the unnamed form at the southeast part of the range.

The aim of this project is both to sample across potential contact zones of the two forms and to assess the phylogeography of *P. vaucheri*, all to determine their evolutionary histories. Initial results have already hinted at clearly structured main form *P. vaucheri* populations across the Moroccan landscape, with each group in the Atlas Mountains range presenting a single mitochondrial lineage and the genetic distance between lineages seemingly congruent with their overall distribution and geographical proximity, and several isolated individuals corresponding to the rarer lineage, the so called "Jebel Sirwah form".

- **15473 | Refining rat TNBS-induced colitis using disease severity predictors**

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Background: Despite the popularity of TNBS (2,4,6-trinitrobenzene sulfonic acid)-induced experimental model of colitis in preclinical testing, the variability of its outcome is confusing and inconsistent.

Aim: To find severity predictors of TNBS-induced colitis, thereby helping to refine this animal model.

Animals and methods: Protocols were approved by the institutional Animal Welfare Body. On day 0, colitis was induced in male Wistar rats (8-12 weeks) with TNBS (20mg/rat in 30% ethanol, intrarectally; n=19). Analgesia was ensured by the administration of tramadol (2.5mg/rat, SC) and Paracetamol (ad libitum in water, 2mg/ml). Metoclopramide was given on day 1 (0.20mg/rat, SC) to avoid intestinal stasis. Littermates were used as controls (n=9). Body weight, food and fluid intake, fecal pellets, general welfare (GW) and rat grimace scores (RGS) were daily monitored. On day 7, the colon was excised and macroscopically categorized in 3 groups: Mild (n=7), Moderate (n=5) and Severe (n=7).

Results: Mild group regained the initial weight by day 7 ($-0.51 \pm 3.04\%$, $p=0.82$), normalized fecal pellets by day 3 (19.2 ± 9.36 vs 23.44 ± 1.57 , $p>0.05$ vs control) and food intake by day 4 ($14 \pm 4.73g$ vs $18.6 \pm 0.7g$, $p>0.05$ vs control). Moderate group normalized fecal pellets by day 5 (30.2 ± 7.74 vs 28.56 ± 1 , $p>0.05$ vs control) and food intake by day 6 ($20.33 \pm 0.68g$ vs $20 \pm 0.3g$, $p>0.05$ vs control). Severe group never recovered these parameters. By day 5, Mild and Moderate groups had lower GW and RGS than Severe group (GW: 1 ± 0.22 , 1 ± 0.29 , 1.83 ; RGS: 0.8 ± 0.12 , 0.83 ± 0.33 , 1.5 ± 0 , respectively; $p<0.05$ for all).

Conclusions: These data suggest that food intake and fecal pellets are good predictors of the severity of TNBS-induced colitis, which is relevant for data analysis, reproducibility of protocols and animal welfare.

European Union (FEDER funds through COMPETE) and National Funds (FCT) support, through project Pest-C/EQB/LA0006/2013 (Portugal). Manuela Morato thanks GEDII for funding.

- **15475 | Impact of phytocannabinoids in endometrial stromal cells turnover**

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The endometrium undergoes dynamic remodeling in order to create a suitable environment for the establishment of pregnancy. The decidualization process corresponds to the morphological and biochemical transformation of endometrial stromal cells into decidual cells and is essential for implantation and placental development (1). The impact of cannabis consumption in fertility has been reported for years, though the effects of the main cannabinoids of the plant *Cannabis sativa*, Δ^9 -tetrahydrocannabinol (THC) and cannabidiol (CBD), on the decidualization process have never been addressed. The aim of this work was to investigate the effects of THC (10 μ M) and CBD (2 μ M) in decidualization process using a primary culture of human decidual fibroblasts (HdF) and an endometrial stromal cell line (St-T1b). The expression of the major decidualization biomarkers, insulin-like growth factor binding protein 1 (IGFBP1), prolactin (PRL) and of the progesterone-induced decidual protein (DEPP) were determined by q-PCR. Morphological alterations were evaluated using Giemsa staining. The antiestrogenic effects of CBD and THC during cell differentiation were assessed by evaluation of aromatase expression by q-PCR and of estrogen receptor α (ER α) protein levels by Western Blot.

In both cells, CBD caused a decrease in the transcript levels of decidual marker genes, which suggests that CBD inhibits cell differentiation. On the contrary, THC did not interfere in this process. In accordance, morphologic analysis indicated that CBD-treated cells exhibit a fibroblast shape, similar to non-differentiating cells. CBD decreased aromatase mRNA levels during cell differentiation, whereas both phytocannabinoids decreased ER α protein levels.

These results indicate that phytocannabinoids affect endometrial differentiation and/or estrogen signaling and, consequently, may lead to fertility/infertility problems.

- **15476 | Geomechanical and Geoseismic Characterization of the IGUP Escarpment – Geophysics Institute of University of Porto**

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The main objective of the present work is to carry out a study on the stability of the IGUP escarpment, through a geomechanical and geoseismic characterization. This study presents a high importance because it was the first time that the stability and safety of this escarpment was analysed. The escarpment of IGUP (Zone 1) is inserted in a larger area known as Serra do Pilar escarpment (Zone 2), where the geomechanical characterization was also performed.

The geomechanical study was based on an exhaustive analysis of discontinuities as well as on the determination of several parameters associated with those discontinuities (alteration, uniaxial compressive strength through the Schmidt hammer, among others). The Markland test was performed for stability analysis. In Zone 1, 32 discontinuities were studied and the uniaxial compressive strength was determined in 17 stations, while in Zone 2, 173 discontinuities were studied and the hardness was measured in 82 stations. The geoseismic study was developed in Zone 1 through 14 seismic refraction profiles, based on the arrival time of the P waves, recorded along 12 vertical geophones, equally spaced.

The results obtained for both zones indicate a great heterogeneity in the various parameters. Zone 1 is highlighted with a high state of alteration and a medium uniaxial compressive strength. The Markland test revealed the possibility of rupture by toppling in Zone 1. The 3D seismic model corroborated the data obtained for the geomechanics. It was also possible to detect a zone where there may be a greater probability of landslides and blocks falling, which may present a fault with indications of recent movement.

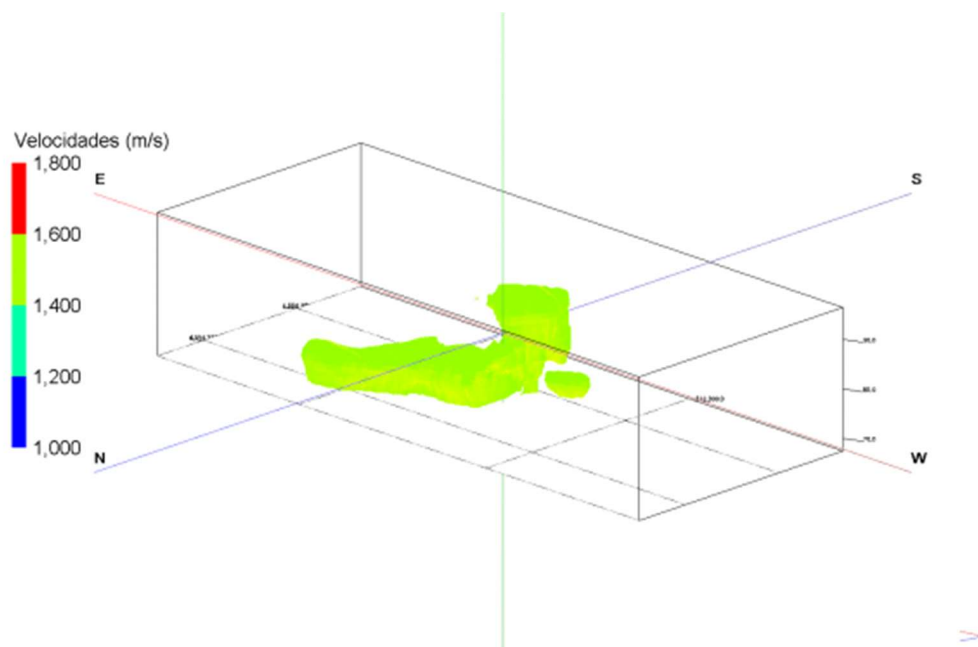


Figure 1 – 3D seismic model referring to Zone 1 with seismic wave speeds above 1400 m/s.

- **15480 | Morphological and physiological responses of strawberry to a biostimulant and calcium application**

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The use of biostimulants in agriculture has been growing due to increased demand for commercial products based on natural substances that enhance crop productivity and quality. Given the high cost of biostimulants, it is of great importance to carry out studies in order to validate their positive effect at plant level and to optimize their application. Also, calcium (Ca) is applied to fruit crops during fruit development to increase postharvest fruit quality. This nutrient has been related to fruit firmness by strengthening the cell wall, improving shelf life. Through an integrated approach, where morphological, physical and nutritional parameters were evaluated, this work aimed to analyse the effect of a seaweed-derived biostimulant (applied every 15 days via fertigation at a dose of 3.0 l ha⁻¹) and calcium (applied every seven days at a dose of 5 kg ha⁻¹) on yield and quality of four strawberry cultivars ('San Andreas', 'Charlotte', 'Portola' and 'Diamante') grown in soil under protected cultivation. In general, the application of biostimulant and calcium proved to be more effective in 'Charlotte' and 'Portola' resulting in higher cumulative productivity. The highest productivity found upon biostimulant application was observed in 'Charlotte' cultivar with a 33% increase. Regarding fruit firmness, significant differences were found between cultivars (with 'Portola' having fruits 55% more firm than the softer cultivar 'Charlotte'). The SPAD values showed a statistically significant effect of plant nutrition as well as significant differences among cultivars. Plants that received biostimulant had a 9% higher chlorophyll. This study shows the strong impact of biostimulants on strawberry productivity, but its extent depends on the cultivar. Higher photosynthetic activity as a result of higher chlorophyll content partly explains this effect. Fruit firmness seems to be more closely related to cultivar rather than by the biostimulant or calcium application.

- **15483 | Potential of Lithium Mining in Portugal**

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To study the Portuguese mining sector, by selecting Lithium ore deposits as a case study is the main goal of the proposed poster. Such aim is obtained through applying the Life Cycle Assessment [LCA] methodology. Portugal has more than 100.000 tons of Lithium ore estimated resources and 11 targets areas have been identified in the portuguese territory. Furthermore, Portugal is currently one of the major players in Europe, concerning the future of this commodity and in the green economy.

To acquire a detailed analysis of all the steps of the economic cycle in the mining process to obtain the final product, a LCA is required for methodological purposes. For each of the LCA stages, Key Performance Indicators [KPI's] will be approached to represent the mining industry particular issues and see where gains can be obtained within improvement strategies.

The project's cost structure in the portuguese framework, presents major challenges due to the existence of large world reserves of lithium salt flats. These deposits have comparatively low operating costs and the study comprehends the respective analyses. Namely the comparison between salt flats and pegmatite deposits, usually 5 to 2 in terms of costs, respectively. The extraction and metallurgical process are those that weigh more costs on pegmatite deposits in particular.

Final remarks are carried out through a SWOT analyses (strengths, weaknesses, opportunities and threats analysis), identifying opportunities and threats of the Lithium ore within the Portuguese mining industry in a general context of the mining industry's strategic management objectives.

- **15487 | Development of an ecotoxicological test procedure with a soil microalga, using soil as a test substrate**

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Despite, the recognized importance of the role of microalgae to soil functions and soils quality, this group of organisms is not considered in the battery of species used to assess the risks contaminants to soil biota. Taking this into account, a microalga species was isolated from biological soil crusts, and was genetically identified as *Micractinium inermum*, a Chlorophyta species with a worldwide distribution. This species was then used to pursue the main objective of this work namely, the development of an ecotoxicological test procedure with a soil microalga, using soil as a test substrate.

To meet this main objective, the following specific tasks were accomplished: 1), the adequacy of the standard protocol for growth inhibition tests with freshwater microalgae and cyanobacteria (OECD 201) was tested for *M. inermum*. Copper (II) and glyphosate (GLY) were selected as reference substances for testing. 2) As a second task, a more ecologically relevant test methodology, using the artificial OECD soil, was developed.

Three independent tests were performed for each reference substance both following the existing standard protocol and the protocol developed in this study. Growth curves both in aqueous BG11 culture medium and in OECD artificial soil were previously obtained for establishing the exposure durations and the validity criteria of the tests.

The reproducibility of the test procedure in artificial soil was demonstrated. The results recorded, showed that *M. inermum* was more sensitive than freshwater microalgae. Additionally, *M. inermum* displayed a similar or a lower sensitivity to the reference substances tested when exposed to them in the artificial soil, highlighting the importance of the test procedure in artificial soil, for assessing the risks of contaminants to soil biota, in more realistic exposure scenarios, to prevent overestimation of risks.

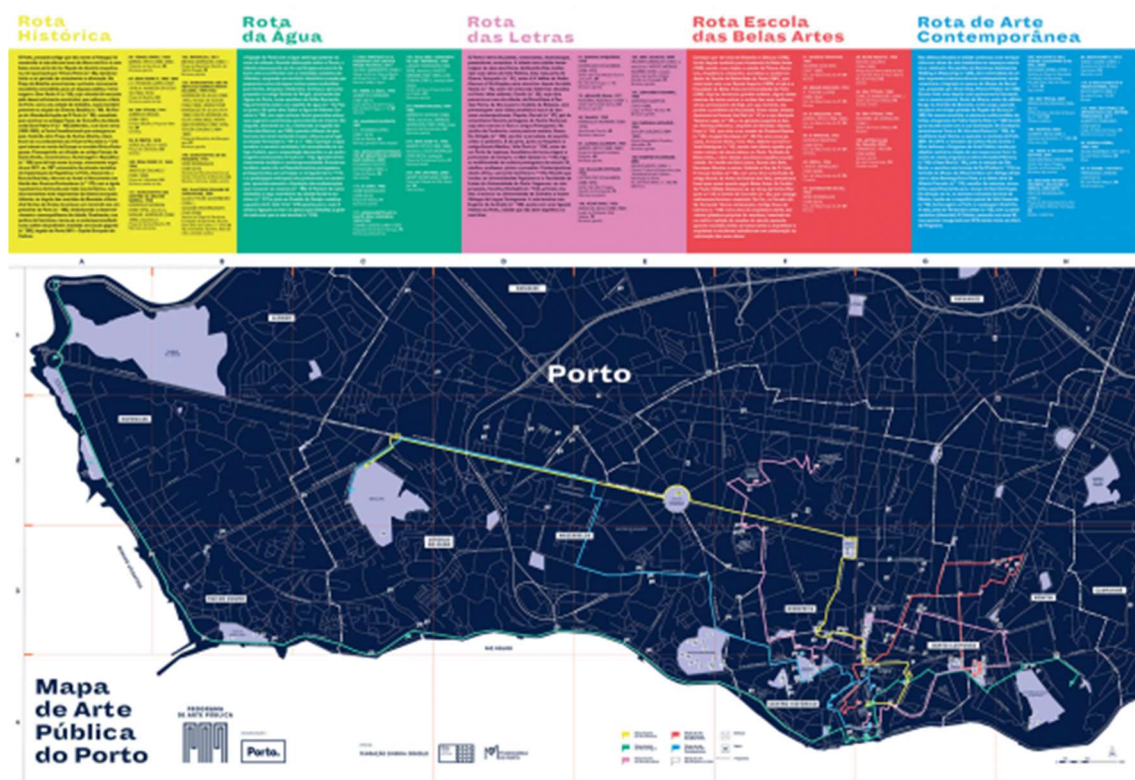
- **15490 | Credulous map, Woman artist, Cruel reality**

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This article reflects on the Public Art Map of Porto published in July 2017. This map printed and freely distributed on the initiative of its promoter, the City Hall of Porto, brings together a significant set of sculptures, monuments, panels and murals installed in the city since the 19th century. Whereas mapping any dimension of reality is often a chimerical challenge, what portions of the city of Porto are represented on this map? Also, taking into account that we find ourselves increasingly familiar with maps and guides whatever their purposes are, what values has this map proposed to organize? Bringing authors such as Filipe Vincente (2012), Hillary Robinson (2015) and Suzana Mocóvio (2016), this reflection problematizes the already expected low participation of female artists in the public art scene in Portugal and hopes simultaneously to contribute to a questioning of the presumed neutrality of this type of documents.

Keywords: Public Art in Portugal, Public Art Map of Porto, Woman Artist, Mapping agency.



Mapa de Arte Pública do Porto. Fonte: Câmara Municipal do Porto

- **15496 | Comparison of plantar pressure between neutral footwear and some models of footwear**

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In the present study we intend to compare the plantar pressure between neutral footwear and some models of footwear in the different anatomical zones of the foot. 19 volunteers, both female and male, were observed by a team of professors that submitted them to questionnaire where they intended to establish some variables, such as, age, weight, footwear number e injuries history. Then, they placed pressure insoles inside the shoes the subjects would wear, placed them in a force platform to collect pedobarographic data that would determine parameters associated to the distribution of the plantar pressure in both feet. These tests consisted in walking through a certain course and repeat this procedure ten times for each footwear model worn. The experimental results showed that parameters such as area, mean and pressure peaks in the different areas of the foot presented significant pressure differences from neutral footwear to the different models experienced. For example: the neutral footwear has 733.69 ± 373.53 kPa for the total foot region and the footwear AM1 presents 627.18 ± 325.21 kPa and among them there is a significant difference of 0.11. The analysis of the plantar pressure has been assuming a high importance both from the point of view of a clinical approach where is possible to obtain specific information regarding the foot that when analyzed allows the detection and study of plantar deformities, either in the aid of the recognition and orientation of an individual regarding some daily life decisions such as the choosing the most appropriate type of footwear.

Key Words: Plantar pressure; gait; pressure peaks; force platform

- **15498 | Evaluation of urinary angiotensinogen and H₂O₂ in human acute heart failure**

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Introduction and aims: The renin-angiotensin-aldosterone system (RAAS) and H₂O₂ contribute to cardiac dysfunction. H₂O₂ may function either as downstream mediator or as upstream regulator of RAAS. Since heart dysfunction negatively affects the kidney and vice versa, we aimed to evaluate the urinary excretion of angiotensinogen (U-AGT, a marker of intrarenal RAAS) and H₂O₂ (U-H₂O₂), as well as their correlation with each other and with cardiac biomarkers in acute heart failure (AHF) and cardiogenic shock (CS). **Methods:** This study was approved by the Health Ethics Committee of Centro Hospitalar São João. Blood and urine samples were collected from patients with AHF (n=9), CS (n=7) or non-cardiogenic shock (NCS) (n=6) at admission, days 3-4 and days 5-7 of the hospitalization period. Samples from healthy volunteers (controls) (n=8) were collected at a single time point. U-AGT and U-H₂O₂ were quantified by ELISA and a fluorimetric assay, respectively. **Results:** U-AGT (ng/mg creatinine) at admission was higher in all patients groups, being markedly higher in CS and NCS (controls: 3.6±0.8; AHF: 18.8±5.9; CS: 106.6±32.6; NCS: 491.1±244.0; CS and NCS vs. controls, p<0.01 and p<0.001, respectively). In most shock patients, U-AGT increased during hospitalization. U-H₂O₂ values (nmol/mg creatinine) at admission were lower in patient groups, particularly in those with shock (controls: 6.3±1.1; AHF: 1.7±0.8; CS: 0.6±0.4; NCS: 0.9±0.5; CS and NCS vs. controls, p<0.01). There was a significant inverse correlation between U-AGT and U-H₂O₂ at admission (r=-0.55, p=0.002) when considering all groups. U-AGT or U-H₂O₂ were not correlated with cardiac biomarkers. **Conclusion:** At admission, U-AGT is higher and U-H₂O₂ is lower in all patients groups, being more markedly altered in shock patients. The inverse correlation between U-AGT and U-H₂O₂ suggests the existence of a counter-regulatory mechanism between these markers. [Funded by FCT/FEDER (COMPETE, Portugal 2020), PTDC/MEC-CAR/32188/2017]

- **15502 | Sensation in Maurice Merleau-Ponty and Gilbert Ryle**

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In this work we will analyze the vision of Maurice Merleau-Ponty and Gilbert Ryle, two contemporary philosophers that evaluate the importance of the notion of sensation in perceptive process. First will see how the notion of sensory impression is treated by both. Finally, we will see that an objective description that a physiological explanation have a problems in some aspects. G. Ryle suggests that there is something of psychological type in a sensation and Merleau-Ponty points to a more elementary and pre-objective perception that already contains and encompasses meaning.

- **15504 | STATIC BALANCE IN YOUTH ARTISTIC AND RHYTHMIC GYMNASTS**

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The elegance, harmony and precision of the movements are visible characteristics in high competition athletes, both in Artistic and Rhythmic gymnastics. Being the balance a motor ability very important for the performance of both sports, since the first years of practice, is fundamental to investigate balance performance in order to prepare gymnasts adequately for training and competitions (1).

Therefore, the objective of this study was to compare the static unipedal balance of preferred foot (PF), non-preferred foot (NPF) and the correspondent functional motor asymmetry (FMA) between gymnasts of the youth category of the Artistic and Rhythmic modalities. The sample comprises eight gymnasts (11.12 ± 0.81 years old) of each modality belonging to competition levels who had an average of 5 years of previous practice. After the application of the Flamingo balance test (2) the data were processed through the software Statistical Package for the Social Sciences (SPSS), version 25.0. using Man-Whitney and Wilcoxon non-parametric tests and Spearman's Ro test. P value was set at $p < 0.05$.

We observed non-significant differences between both groups according PF, NPF and FMA (Artistic gymnastics: 4.25 ± 2.55 ; 4.63 ± 1.84 ; 1.88 ± 1.12 respectively and Rhythmic gymnastics: 4.13 ± 3.48 ; 4.38 ± 2.32 ; 1.50 ± 0.92 respectively). Considering each modality, we did not verified significant differences between PF and NPF in the performance of static balance. However, an interesting significant correlation was detected between PF and NPF in athletes of Rhythmic ($r=0.855$; $p=0.010$). A statistically significant correlation did not occur in the Artistic gymnastics ($r=0.528$; $p=0.179$).

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2. EUROFIT (1983) - Physical Fitness Test Battery (Council of Europe, 1983). Flamingo Balance Test.

- **15507 | Development of a methodology to evaluate geological heritage. Case study – Municipality of Valongo**

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It was developed a methodology to evaluate the geological heritage where is determined the importance of a geosites as to its Intrinsic Value, its Potentiality of Use and the Need for Protection. Therefore, it was identified, characterized and evaluated twenty-six geosites, that were selected because they represent the geological history and geodiversity of the municipality, presenting varied contents that can be used for educational, scientific and/or tourist purposes. The results of the application of this methodology allowed to hierarchize the selected sites, showing which ones are the most valuable and which ones need urgent protection.

To have an orientation on which geosites need more imminent protection, a vulnerability matrix was proposed, in which were projected the results obtained with the criteria used. Knowing this heritage and its vulnerability, it is important to integrate them into the Territorial Planning policies, in this way it can be ensure that anthropic activities safeguard geological heritage while promoting in a sustainably manner, there value and use.

Therefore, the present study shows the geological heritage of the municipality of Valongo with the purpose of divulgation and preservation, as well as promote the vast geological interest, namely the existence of several aspects of paleontological interest, stratigraphic, geomorphological, tectonic, mineralogical and mining, as well as assist in the growth and evolution of this theme.

This work has also allowed the creation of a geological heritage map of the municipality of Valongo, where the twenty-six geosites are registered. In addition to the geological heritage, Valongo has also other important values, such as ecological, archaeological, mining, historical or cultural, and from a tourist interest perspective, can play a decisive role in the sustained economic development of the region.

- **15508 | Assessment of the relationship between the Deposition of Inert Waste in the recovery of a quarry, and the Qualitative State of Groundwater**

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It was analyzed the environmental state of the Quinta do Moinho Quarry surroundings, generally known as Madalena Quarry, located in Canidelo, Vila Nova de Gaia. Currently, the quarry is at the stage of landscape restoration, being rehabilitated by means of a full or partial filling method, in which the received waste is used to fill the hole resulting from the excavation. The deposited waste in this activity is inert waste. However, if left unmonitored, it can produce contaminants, by leaching processes, which are prone to degrade the quality of groundwater resources. Thus, it is necessary to study and examine this waste.

The main objective of our work was to assess soils from recovering industrial areas in order to determine if that type of waste could be deposited in an inert waste landfill. For this purpose, and in view of the current situation of the Madalena quarry, in particular the monitoring of groundwater resources, the methodology used included the completion of a leaching test according to EN12457-2:2002 to obtain the eluate which was later sent to laboratory analysis. The results obtained beyond the eluate analysis, also contemplated the soils analysis, with the intent to verify if the values obtained are within the limit values stipulated in accordance with the regulations and decree-laws, in turn, to determine if the waste/soil can be admitted to the landfill for inert waste, and thus verify if they can be deposited in the Madalena quarry. Three soils from disused industrial zones located in Porto, Braga and São João da Madeira were sampled.

The soils and eluate laboratory results allowed us to conclude that the Porto soil is an admissible waste in a landfill for inert waste. On the other hand, the Braga soil is a waste that can not be admitted in an inert waste landfill, so that, it can not be deposited in the Madalena quarry. In the case of the São João da Madeira soil, although the leaching test was carried out, the results were not conclusive.

- **15511 | How does referee's attention change along a football game?**

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Perez, Pablo, Faculdade de Desporto da Universidade do Porto, Spain

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After several studies about players, coaches, tactics, technical, physical and psychological abilities, emerged a need about knowing more about another very important element in a football game: the referee. We decided to understand how does referee's attention change along the game. The more focused a referee is, better decision he will make. Better referee's decisions contribute to sportive truth's growth. Sportive truth's growth contributes directly to Sport's growth.

To realize how does referee's attention change along the game, we applied "Trail Making Test part B" to 6 referees from Football Association of Viana do Castelo, before a match (M1), at half-time (M2) and at the end of the game (M3). After that, we used SPSS to execute a "dependent samples t test" in order to compare groups (M1xM2; M2xM3 and M1x M3) to check if there is any significant difference between referee's levels of attention at the 3 moments of the game.

We concluded that, despite not having significant differences between the beginning and the end of the game, there are significant differences between the beginning and the half-time ($p=0,000$) and between half-time and the end of the game ($p=0,017$). The maximum point of attention occurs at half time. Referee's levels of attention increases from the beginning of the game until half-time, and decreases from half-time until the end of the game.

Key-words: FOOTBALL; REFEREE; ATTENTION

- **15512 | Feedback's influence on Normovisual and Visual Impaired Individuals**

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People with visual impairment have a tendency to develop the other senses when compared with people that don't have that disability. A good feedback is very important in sports practices as well as on several occasions of the day-to-day life. The main goal of this study was to understand if there was any difference in the influence of feedback received for carrying out on the activity of target shooting between people with disabilities and people without any type of visual impairment. The sample consisted of twelve male participants, six blind and the other six without visual impairment, and the protocol used was the Feedback or IRR - Different Types of Knowledge of results in which the participants had to throw the ball against the target receiving the proper feedback in three conditions. The statistical procedures used were descriptive analysis, the Non-Parametric Mann-Whitney, Friedman and Wilcoxon. In the results, the only significant differences ($p < 0,05$) that were found were between the conditions tested in the blind people with a value of $p = 0,030$, more precisely when comparing the condition one (less feedback given) with the condition three (more precise feedback given). In conclusion, it was expected that the blind individuals had better results compared with the participants without visual impairment, however, that wasn't possible to conclude in this study because there weren't any significant differences when comparing the sample.

Keywords: visual impairment, feedback, knowledge of results

- **15513 | Sports Effect on the Dynamic Balance in Young Acrobatic and Aerobic Gymnasts**

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Gymnastics is a very old sport. Its areas came from old China, Egypt, Greece and Rome. Gymnastics is a very complex sport, characterized by capacities with a high level of demand in what concerns mainly the balance. Hence, our goal was to evaluate the influence of two gymnastics areas in the dynamic balance and functional motor asymmetries. The sample consisted in twelve gymnastics athletes, six of aerobic gymnastic and six of acrobatic gymnastic, with ages between eight and thirteen years. The test used was the Star Excursion Balance Test (SEBT) adapted to Y Balance Test (YBT). The results obtained using the non-parametric tests, Mann-Whitney and Wilcoxon, revealed no significant differences in the dynamic balance between aerobic and acrobatic gymnastics, neither between preferred and non-preferred limbs. Considering muscular asymmetries, two out of six acrobatic gymnasts presented an injury risk in the three planes while the aerobic ones presented any kind of asymmetry. We conclude that functional asymmetries in dynamic balance should be taken into consideration considering injury risk.

Keywords: Dynamic balance, aerobics gymnastics, acrobatics gymnastics, asymmetry, injury risk.

- **15514 | The visual search behaviour of U14 basketball players of different competitive levels**

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In this study the visual search behaviour of U14 basketball players of national and regional competitive levels was evaluated from the defensive perspective during small-sided and conditioned games (1x1 and 2x1). From a total of 48 male players tested, 12 (13.8 ± 0.8 years old) were included in the national competition group (NCG) and the remaining 36 (13.7 ± 0.8 years) formed the regional competition group (RCG). The visual search behaviour was recorded through the eye tracking system Tobbi Pro Glasses 2® using the following visual indicators: medium fixation duration, number of fixations per repetition, medium fixation duration per area of interest, number of fixations per area of interest and percentage of the time of fixation per area of interest. Mean $\pm$ SD and t-test for independent measures were used for comparing groups ($p < 0.05$). The obtained results showed statistical differences ($p < 0.05$) in the strategies of visual search between groups of different competitive levels. Regarding the situation of 1x1, the NCG accomplished a larger number of fixations in the location of ball than the RCG (1.113 ± 0.968 vs 0.661 ± 0.522) and in the location upper limb with the ball of the player in ball possession (0.992 ± 0.602 vs 0.594 ± 0.462), also showing a higher percentage of time fixation for the same areas of interest (ball: 15.628 ± 14.310 vs 8.342 ± 7.485 ; upper limb with the ball of the player in ball possession: 13.284 ± 9.812 vs 7.567 ± 6.638). According to the results obtained, it was concluded that youth basketball players showed different visual search behaviours according to their competitive level.

Key Words: Basketball; Defensive Skill, Visual Behaviour, Eye Tracking, In Situ.

- **15515 | Pedal coordination and velocity reaction in rope skipping athletes**

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The purpose of our study was to analyze the influence of sex and practice time in pedal coordination and reaction time velocity in Rope Skipping athletes. Our sample comprised 31 athletes of Taipas Rope Skipping Club - Molinhas, 20 females and 11 males. These were subdivided in time practice groups, with 0-2 years (n=7), 2-5 years (n=9) and +5 years (n=15). To the realization of this investigation, after realized the pedal preference questionnaire (Coren, 1993), we applied the Nelson Ruler Test (1965) and the Combined Pedal Dexterity test. Independent measures t-test and ANOVA t-test were used and revealed significant statistic differences in practice time variable relatively to pedal reaction velocity capacity for the preferred foot, highlighting the values of the athletes with practice time above 5 years, as well as in pedal coordination in function of sex variable, where males had better values.

Key-words: Reaction velocity; Coordination; Rope Skipping; Pedal dexterity; laterality.

