10th CQM ANNUAL MEETING

ABSTRACT BOOK

01-02 JUNE 2023
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CQM
CENTRO DE QUÍMICA DA MADEIRA

UNIVERSIDADE da MADEIRA

ABSTRACT BOOK

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Funchal, Madeira Island – PORTUGAL

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Edited by:

João Rodrigues
Mara Gonçalves
Énio Freitas

Organizing Committee and Secretariat:

Mara Gonçalves
Énio Freitas

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ABOUT CQM

CQM is a National Research Unit and a "*refugee-welcoming organization*", supported by **FCT** (Unit 0674 – Ranking: Excellent), **ARDITI**, and **SRECT**.

Governance Structure

Executive Committee (2023-2024)

João Rodrigues	*Scientific Coordinator*
Pedro Pires	*Materials Group Representative*
Paula C. Castilho	*Natural Products Group Representative*

CQM Gender Equality Officer

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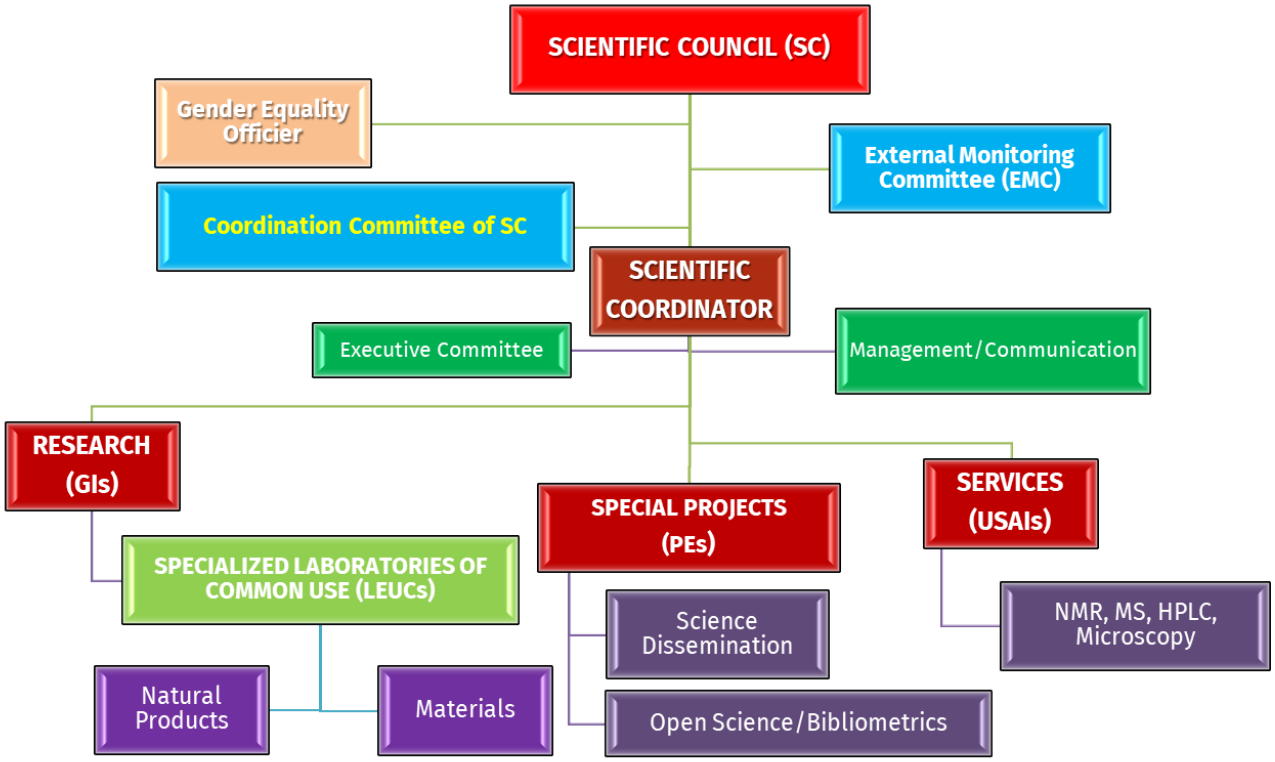
Jean-Pierre Sauvage (2016 Nobel Prize in Chemistry)	*Institut de Science et d'Ingénierie Supramoléculaires, University of Strasbourg (France).*

Organizational Structure



Vision and Mission

Our Vision
Making the CQM a renowned research institution in the field of Natural Products and Materials.

Our Mission
CQM – Centro de Química da Madeira/Madeira Chemistry Research Centre – constitutes a central element in the promotion and enlivening of R&D activities in the field of Chemistry and Biochemistry in the Autonomous Region of Madeira, Madeira Island, Portugal. CQM is firmly committed in the development of advanced training, partnerships with national and international institutions, the offer of services to the community and in the popularization of science.

Our Philosophy
To be a relevant part of a scientific community that performs world-class research aimed at improving the scientific knowledge and the well-being of Society.

Working Areas and Research Groups
CQM is organized in two interdisciplinary research groups – **Materials** and **Natural Products** – developing its R&D activities in Analytical Chemistry, Food Chemistry, Health, Materials, Molecular Modelling, Nanochemistry, and Phytochemistry at specialized laboratories of common use.

Our Logo
The CQM logo is composed of different colored petals, each one representing various areas of chemistry and biochemistry, working together to improve scientific knowledge and contribute to the well-being of Society.

CQM Commitments and Principles

CQM follows the Code of Conduct from the University of Madeira, the rules of the Fundação para a Ciência e a Tecnologia (FCT-IP), the European Charter for Researchers, the Code of Conduct for the Recruitment of Researchers (Commission Recommendation, Brussels, 11.3.2005, 2005/251/EC) since 2008, and the recommendations from the San Francisco Declaration on Research Assessment (DORA) being committed to the principle of equity in employment and selection based on merit, non-discrimination in respect of gender, age, nationality, religion, racial group, or any other possible discriminatory issue.

CQM is strongly committed to all the European regulations related to the ethical, legal and social aspects (ELSA) and governance of nanotechnology, namely with the COMMISSION RECOMMENDATION of 07/02/2008. CQM also voluntarily follows the Code of Conduct for Responsible Nanosciences and Nanotechnologies research and the opinion of the European Group on Ethics in Science and New Technologies concerning the ethical aspects of Nanomedicine.
Part of the research that is being conducted at CQM is in close collaboration with the local Hospital, and the existence of a cell culture facility at CQM allows for the biological evaluation of the developed materials in Madeira (*e.g.,* cytocompatibility studies, gene delivery studies). In particular, adult human stem cells are being used in the studies with the authorization of the Local Ethical Committee and also respecting the national and European rules.

CQM Gender Equality Officer Duties

Constitution of the Portuguese Republic
"Art. 13: Principle of equality

1. All citizens have the same social dignity and are equal in the face of the law.

2. No one shall be privileged, favored, prejudiced, deprived of any right, or exempted from any duty based on ancestry, sex, race, language, territory of origin, religion, political or ideological beliefs, education, economic situation, social condition, or sexual orientation.

...

Art. 15: Stateless Persons, European Citizens

1. Foreigners and stateless persons who are or who reside in Portugal shall enjoy the rights and be subject to the duties of Portuguese citizens."

The role of the gender equality officer involves participating in various initiatives related to gender equality, promoting work-life balance, and ensuring protection against workplace harassment in all aspects of personnel, organizational, and social matters.*

*In *sensu lato*

CQM — We will never give up

Prologue

The CQM-Centro de Química da Madeira is a research unit funded in 2004, hosted by the University of Madeira (UMa), Madeira Island, with a strong know-how in Chemistry and Biochemistry. CQM has the ambition of being a leading international R&D entity in the field of Natural Products and Materials, contributing to the development and internationalization of UMa and the Madeira Archipelago, and the social and economic growth and cohesion within Portugal and Europe. According to its statutes (published in DR, II série, N° 86 de 6 de Maio de 2019), CQM is organized into two research groups (the Natural Products Group - NPG & the Materials Group - MG) and three units (support to research, external services, and special projects). The researchers at CQM have access to 10 specialized shared-use laboratories and an in-house facility that produces liquid nitrogen.

On December 31, 2022, the CQM team comprised 66 researchers: 28 Ph. D.s (15.9 ETI: 14 Senior researchers and 13 post-Docs), 17 Ph.D. Students, and 21 other researchers, including 10 researchers with a Master degree.

CQM integrates 3 National research infrastructures: the Portuguese network for screening new drugs (PT-OPENSCREEN - National Infrastructure for Chemical Biology and Genetics, member of the EU-OPENSCREEN - European high-capacity screening network), the RNEM - Portuguese Mass Spectrometry Network and the PTNMR and the Portuguese Nuclear Magnetic Resonance Network, both last infrastructures making part of INSTRUCT ERIC, the pan-European research infrastructure in structural biology.

— • —

Ten years after the organization of its first annual meeting, and almost 20 years since its birth, the CQM continues today, as in the past, to produce scientific and technological knowledge with a high social and economic impact, seeking to offer those who work there conditions comparable to those of other international research centres.

At this moment, I could discuss in detail how it was possible for a small team of researchers in 2004, located in an outermost region and lacking sufficient resources, to manage to accomplish what we have accomplished in nearly two decades of work. I could also mention the various challenges we have faced, both internal and external. Some of these challenges stem from our size and location, while others have been intentionally imposed by individuals within the institution who perceive us as a threat to the established order and against whom we must constantly fight. However, I choose not to discuss these matters currently.

While UMa was searching for its path, CQM steadily built its own path through the hard work and sacrifice of its researchers, strategic vision, and support from FCT, Santander Bank, and European funds. Over the years, CQM has not only established itself in the

Region but has also gained international recognition. Despite facing opposition from some within the institution, CQM became the first and only research centre entirely based in the Autonomous Region of Madeira to receive, through peer review, an "**EXCELLENT**" FCT classification. Without undermining the efforts of others, CQM is the only FCT research unit in the Region with international visibility and recognition. Let's take a closer look at some significant milestones in our recent journey.

In the period 2011-2021, when looking at scientific papers with impact factor per million inhabitants, CQM was responsible for 40% of publications in the Autonomous Region of Madeira. As shown in Figure 1, CQM also has a strong international presence, with a higher percentage of co-authored publications with institutions from other countries compared to the national average.

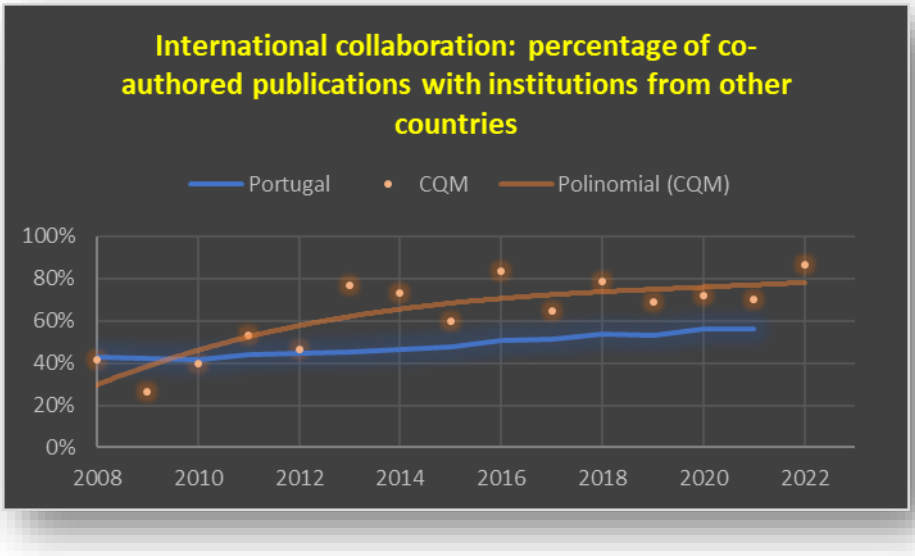


Figure 1 – Co-authored publications with institutions from other countries: CQM *vs.* Portugal.

Between 2018-2022, CQM published **324** papers with an impact factor that already counts more than 5700 citations. Of these articles, 75 were published in 2022 (Figure 2). Additionally, 5 more papers were published in journals without available impact factors. In total, CQM published in 2022, 80 papers in peer-reviewed journals, 2 books, and 7 book chapters or 89 publications.

Also, in the period 2018-2022 and in the year 2022, CQM publications reached, respectively, the highest average impact factor ever (IF_{av}=5.81) (Figure 3) and the highest annual impact factor value (IF = 6.85).

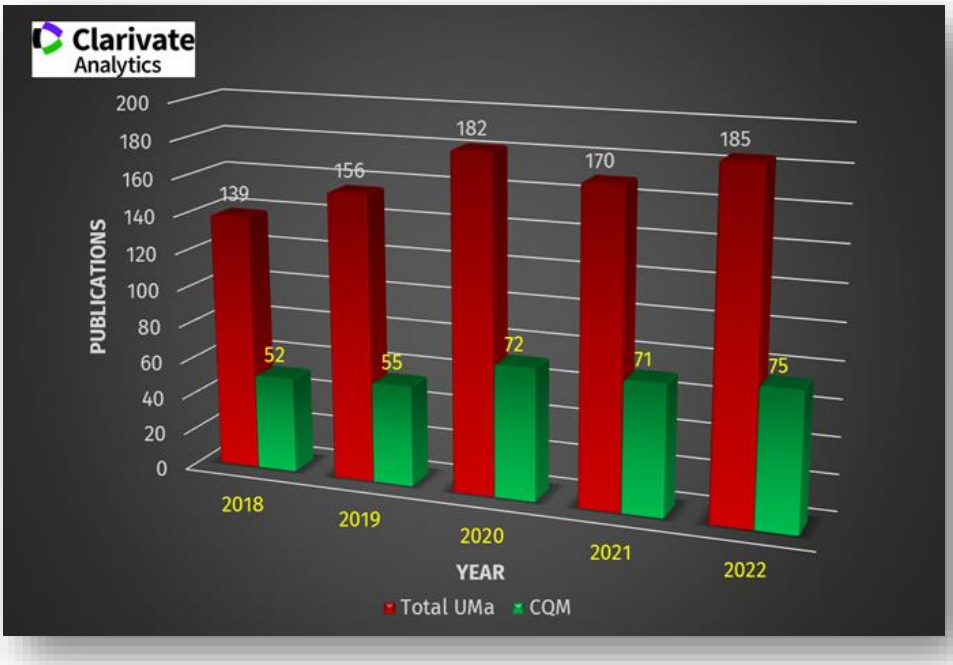


Figure 2 - CQM publications from 2018-2022(Only articles in journals with impact factor).

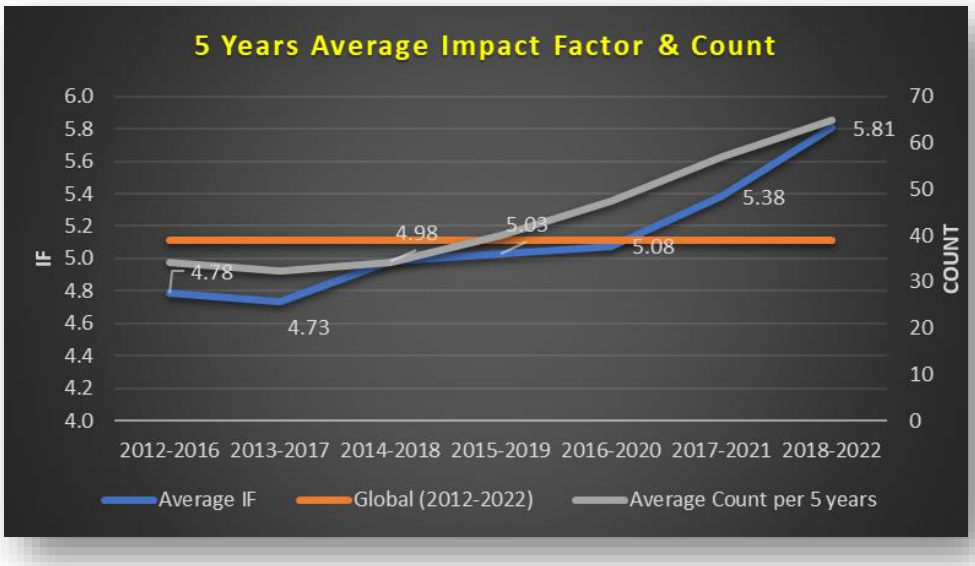


Figure 3. Five years impact average.

In terms of Sustainable Development Goals (SDGs) in 2022, the CQM publications were classified into 5 of the 17 SDGs, and 71% of our papers were classified into at least 2 SDGs, distributed as presented in the Figure 4.

Figure 4. Distribution of the 2022 Publications (%) by Sustainable Development Goals (SDGs). SDG 3 (Good health and well-being), SDG 17 (partnerships for goals), SDG 2 (zero hunger), SDG 9 (industry, innovation, and infrastructure), SDG 14 (life below water).

In the last year, 1 Ph.D. and 5 MSc students completed their training at CQM, and six CQM researchers (one more than in 2021) are among the world's top 2% scientists featured by Stanford University and Elsevier (Figure 5). Of these 6 researchers, 3 are young researchers, and the others already have established careers and international recognition in their different areas of intervention. It is also relevant to point out that of the 5 most cited researchers from the University of Madeira, the first 4 are researchers from CQM.

In accordance with what was foreseen, in 2022, we maintained our policy of reinforcing CQM in equipment and human resources, not only to reach the scientific objectives predicted for the end of the project but also to remain competitive at an international level.

In this sense, Dr. Miguel Fernandes, was hired as an invited senior researcher. Additionally, 2 more Ph.Ds. grants were also approved (1 directly supported by FCT), and 7 Ph.D. students from abroad (Argentine, Spain, Italy, and Tunisia) were also received by the Centre.

Figure 5. CQM researchers on the World's Top 2% Scientists list (2022).

In terms of investment in equipment to complement and improve existing resources, in 2022, we invested EUR 65,300 to acquire three medium-sized equipment for common use: a refrigerated centrifuge (Centrifuge Sigma 3-30KS), Real-Time PCR System (Azure Cielo 6), and an imaging system (Azure 400) (Figure 6). This investment is part of our sustained policy of investing to support research and development at CQM in common needs.

(a) (b) (c)

Figure 6. Main CQM equipment acquired in 2022 (a) Centrifuge Sigma 3-30KS, (b) Real-Time PCR System (Azure Cielo 6), (c) Imaging system (Azure 400).

Between 2017 and 2022, the CQM and its researchers administered funds in the Region totaling 3.9 million Euros. This amounts to approximately 0.65 million Euros per year. While there has been a decrease in expenditure since 2019 due to the end of the European funding cycle, it is worth highlighting that during this period, a significant portion of the expenditure was made through European programs (H2020 and FEDER)

and the national budget (OE). These sources accounted, respectively, for 71.6% and 28% of the total executed expenditure (Figure 6).

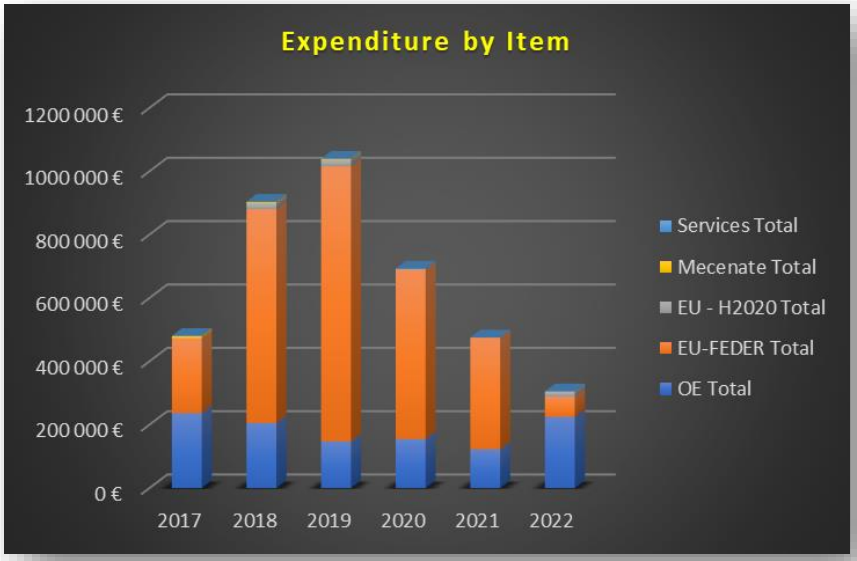


Figure 6. CQM Expenditure by item in the period 2017-2022.

Despite achieving these results, in a year of FCT international evaluation, CQM encountered a setback with the University of Madeira's decision to withdraw the spaces it had entrusted to CQM. This not only hampers CQM's ability to safely manage the spaces and equipment under its responsibility but also hinders the progress of its research project in the forthcoming years.

However, those who think that we submit ourselves to institutional dystopia and management of personal interests are wrong. CQM, inside or outside the University, will continue, as it has done until now, to fulfill the mission for which it was created, contributing to the scientific and technological development of the Madeira Archipelago, Portugal, and Europe, training staff and providing services to companies, without neglecting its connection to society.

Yesterday as today, we will never renounce our goals and vision, nor will we surrender to adversity.

University of Madeira, Funchal, 01st of June of 2023

João Rodrigues
(Scientific Coordinator of CQM)

PROGRAM

Thursday, 01st of June of 2023		
09:00	09:30	**Participants Registration**
09:30	10:15	**Opening Session** Sílvio Fernandes *Rector of the University of Madeira* Marco Gomes *On behalf of the Regional Secretary of Education, Science and Technology, Jorge Carvalho* Francisco Fernandes *President of the General Council of the University of Madeira* Maribel Gordon *President of the Faculty of Exact Sciences and Engineering* Clemente Aguiar *On behalf of the President of the Administration Council of ARDITI, Rui Caldeira* João Rodrigues *Scientific Coordinator of CQM*
10:15	10:45	**Coffee-break**
Chair: Jorge Pereira		
10:45	11:25	[O-01] **Investigating the role of hydrogen sulfide in neurodegeneration: focus on Amyotrophic lateral sclerosis (ALS)** Viviana Greco, Alida Spalloni, Nicola B. Mercuri, Patrizia Longone & Andrea Urbani
11:25	11:50	[O-02] **Intoxications associated with fish consumption: the case of ciguatera** Pedro Ideia, Mafalda Freitas, João Delgado & Ricardo Sousa
11:50	12:05	[O-03] **Synthesis and characterization of fluorescent carbon nanoparticles from *Ricinus communis* L.** Filipa Pita, Ivo Martins & João Rodrigues
12:05	12:30	[O-04] **Assess the potential of urinary volatilomic pattern of COVID-19 patients infected by SARS-CoV-2. An exploratory study** Giulia Riccio, Joana Lira, Cristina V. Berenguer, Cristina P. Ornelas, Rafaela Fernandes, Viviana Greco, Rosa Perestrelo, Jorge A.M. Pereira & José S. Câmara
12:30	12:35	**10th CQM Annual Meeting Photo**
12:35	14:00	**Lunch**
Chair: Jaison Jeevanandam		
14:00	14:40	[O-05] **Green biomaterials (IV): Natural-based steroid copolymers with pH/redox dual Stimuli-responsive properties towards cancer chemotherapy** Ruilong Sheng

14:40	15:05	[O-06] **Aromatic herbs – From Mediterranean cuisine to allies in pest control** Rui Ferreira & Paula C. Castilho
15:05	15:30	[O-07] **The effect of nitrogen and sulfur-based precursors on the synthesis and optical properties of carbon dots** Ivo Martins & João Rodrigues
15:30	15:45	[O-08] **Hesperidin as a potential biopesticide for environmental applications: extraction, purity determination, and formulation** Verónica Pereira, Onofre Figueira & Paula C. Castilho
15:45	16:00	[O-09] **Development of Laponite® gels for cisplatin delivery** Ana Duarte, João Rodrigues & Helena Tomás

Friday, 02nd of June of 2023		
Chair: Ruilong Sheng		
09:30	10:00	[O-10] **The impact of *Arundo donax* leaf-derived nanocellulose formulation on the mustard plant growth** Jaison Jeevanandam & João Rodrigues
10:00	10:25	[O-11] **Stabilization of *Lactiplantibacillus plantarum* WCFS1 during freezing, freeze-drying, and storage using legume wastewater extracts containing galacto-oligosaccharides** Gonçalo N. Martins, Maria Guerrero Sanchez, Angela D. Carboni, Fernanda Fonseca, Sonia Campoy, Andrea Gómez-Zavaglia & Paula C. Castilho
10:25	10:50	[O-12] **Polyester-based dendritic block copolymers with biodegradable properties for potential cancer treatment** Fátima Mendes, Natalia Sanz del Olmo, Jorge San Jacinto Garcia, Michael Malkoch & Helena Tomás
10:50	11:05	[O-13] **Purification of galacto-oligosaccharides by enzymatic reaction with glucose oxidase** Javier González, Gonçalo N. Martins, Andrea Gómez-Zavaglia & Paula C. Castilho
11:05	11:30	**Coffee-break**
Chair: Mara Gonçalves		
11:30	11:55	[O-14] **Membranes for biomedical applications: Investigating the potential of pectin and chitosan** Onofre Figueira & Paula C. Castilho
11:55	12:20	[O-15] **Transfection studies of oxidized fluorinated generation four PAMAM dendrimers** Lydia dos Orfaos, Helena Tomás & João Rodrigues
12:20	12:45	[O-16] **Interdelta polymorphism analysis for identification of *Saccharomyces cerevisiae* strains** Mariangie M. Castillo, Nikol Parra, José S. Câmara & Mahnaz Khadem

12:45	13:10	[O-17] **New dendritic ruthenium-based anticancer nanosystems: theoretical multi-step synthesis procedures coming to life** Nádia Nunes, Xiangyang Shi & João Rodrigues
13:10	13:40	**Closing Session**

Coffee breaks are sponsored by:

ORAL COMMUNICATIONS

[O-01]

Investigating the role of hydrogen sulfide in neurodegeneration: focus on Amyotrophic lateral sclerosis (ALS)

Viviana Greco[1,2]*, Alida Spalloni[3], Nicola B. Mercuri[4], Patrizia Longone[3] & Andrea Urbani[1,2]

[1] Department of Basic Biotechnological Sciences, Intensivological and Perioperative Clinics, Catholic University of the Sacred Hearth, Rome, Italy
[2] Fondazione Policlinico Universitario A. Gemelli IRCCS, Rome, Italy
[3]Molecular Neurobiology Unit, Experimental Neurology, IRCCS Fondazione Santa Lucia, Rome, Italy
[4] Department of Experimental Neuroscience, IRCCS Fondazione Santa Lucia, Rome, Italy

*Corresponding author: viviana.greco@unicatt.it

Over the past 30 years, a considerable amount of data has accumulated on the multifaceted role of hydrogen sulphide (H_2S) in the central nervous system. H_2S is recognised as an endogenous gasotransmitter with a dual action. Indeed, depending on its concentrations, H2S can act as an antioxidant and cytoprotective, but also as a poison with a high probability of causing brain damage if present at harmful concentrations (μM).

The accurate determination of H_2S levels in the brain is still a significant challenge to understand its biochemistry and function. Therefore, we developed an analytical chromatographic method to measure H2S and derived sulphur species in cerebrospinal fluid (CSF), a key biofluid for the study of neurodegenerative diseases. A cohort of CSF samples from patients with inflammatory and demyelinating disorders (acute disseminated encephalomyelitis; multiple sclerosis), chronic neurodegenerative diseases (Alzheimer's disease; Parkinson's disease) and motor neuron diseases (amyotrophic lateral sclerosis, ALS) was analysed **[1]**.

Toxic levels of H_2S have been shown in ALS patients compared to other diseases. ALS is a deadly disease characterized by motor neuron neurodegeneration. Despite considerable research efforts, the exact mechanism behind ALS pathogenesis is not yet fully understood. A complex interaction of genetic and environmental factors, particularly redox dysregulation and mitochondrial dysfunction, contributes to motor neuron damage.

Through in-depth multi-omics investigations still underway on cell models and neuronal tissues derived from a familiar ALS mouse model ($SOD1^{G93A}$), we have shown that altered H2S signalling can be an additional contributing factor to disease pathogenesis.

References: [1] Greco, V.; Neri, C.; Pieragostino, D.; Spalloni, A.; Persichilli, S.; Gastaldi, M.; Mercuri, N.B.; Longone, P.; Urbani, A. Metabolites, **2021**, 11, 152.

[O-02]

Intoxications associated with fish consumption: the case of ciguatera

Pedro Ideia[1,2]*, Mafalda Freitas[1,3,4], João Delgado[1] & Ricardo Sousa[1,3,4]

[1] Direção Regional do Mar (DRM) / Direção de Serviços de Monitorização, Estudos e Investigação do Mar (DSEIMar) – Lota do Funchal, 1.º piso, Rua Virgílio Teixeira, 9004-562 Funchal, Madeira, Portugal
[2] CQM – Centro de Química da Madeira, Universidade da Madeira, Campus da Penteada, 9020-105 Funchal, Portugal
[3] MARE - Marine and Environmental Sciences Centre, Agência Regional para o Desenvolvimento da Investigação Tecnologia e Inovação (ARDITI), Funchal, Portugal
[4] Observatório Oceânico da Madeira, Agência Regional para o Desenvolvimento da Investigação Tecnologia e Inovação (OOM/ARDITI) – Edifício Madeira Tecnopolo, 9020-105 Funchal, Madeira, Portugal
*Corresponding author: pedro.di.freitas@madeira.gov.pt

The Regional Directorate for the Sea, of the Regional Secretariat for the Sea and Fisheries, is responsible for sea researching, namely with regard to the study of contaminants in fish.

The ongoing research work at DRM's Chemistry and Biochemistry Laboratory, under co-funded projects, focuses mainly on fish contamination by heavy metals and marine biotoxins, with a direct influence on the health of consumers.

Ciguatera is a food poisoning caused by consumption of fish contaminated with ciguatoxins. These marine biotoxins are produced by dinoflagellates of the genus *Gambierdiscus* and *Fukuyoa*. In the Canary Islands, ciguatera is already a notifiable disease, and there are several species that, above a certain weight, must be tested for the presence of ciguatoxins. This is an emerging theme since, due to the increase in the average temperature of sea water, there are already positive cases for ciguatoxins in fish caught in Madeira's seas.

The first case of ciguatera diagnosed in the Autonomous Region of Madeira dates back to 2008, when a group of fishermen presented gastrointestinal and neurological symptoms after consuming an amberjack (*Seriola* spp.) caught off the coast of Savage Islands.

However, the subject is still little known, so the work of research projects also involves the dissemination of information related to the risks associated with the consumption of fish.

Acknowledgments: Authors are grateful to RASPA and MIMAR+ projects (co-financed by EU Interreg 14-20 MAC program). PI also acknowledge the support of FCT-Fundação para a Ciência e a Tecnologia (Base Fund UIDB/00674/2020 and Programmatic Fund UIDP/00674/2020, Portuguese Government Funds), Secretaria Regional de Educação, Ciência e Tecnologia, through ARDITI-Agência Regional para o Desenvolvimento da Investigação Tecnologia e Inovação.

[O-03]

Synthesis and characterization of fluorescent carbon nanoparticles from *Ricinus communis* L.

Filipa Pita, Ivo Martins & João Rodrigues*

CQM – Centro de Química da Madeira, Universidade da Madeira, Campus da Penteada, 9020-105 Funchal, Portugal.

*Corresponding author: joaor@uma.pt

The presence of invasive plants, such as *Ricinus communis* L. (RC), in the Macaronesia archipelagos, is negatively impacting the environment. To mitigate this issue, RC can be transformed into functional nanomaterials, such as carbon nanoparticles (CNPs), helping in the future, to the reduction of the affected area. CNPs are nanomaterials with sizes ranging between 1-100 nm [1,2] possessing various interesting characteristics, including photoluminescence, water solubility, low cytotoxicity, and surface functionalities [3,4], which make them suitable for various applications (*e.g.* imaging). CNPs can be synthesized via "bottom-up" methods, such as hydrothermal synthesis, using small carbon-rich molecules or natural products, such as plants and vegetable wastes, as starting materials **[5]**. This work presents the most recent results on the use of RC as a natural starting material for CNP synthesis through the hydrothermal method. A systematic approach was used to investigate the effect of reaction time on CNPs yields, mass and quantum yields, and photoluminescent properties. The synthesized CNPs were characterized using various techniques, including UV-Vis, fluorescence, IR spectroscopy, dynamic light scattering (DLS), and transmission electron microscopy (TEM). Overall, we obtained blue fluorescent carbon nanoparticles with less than 70 nm, these which results will be presented and discussed.

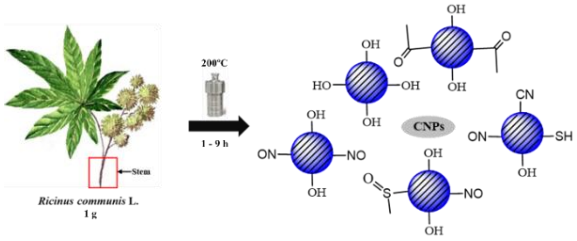


Figure 1. Hydrothermal synthesis representation.

References: [1] Bera, A.; Belhaj, H. *J. Nat. Gas Sci. Eng.,* **2016**, *34*, 1284. **[2]** Attota, R. K.; Liu, E. C. *Anal. Bioanal. Chem.,* **2016**, *408*, 7897. **[3]** Zhang, X.; Jiang, M.; Niu, N.; Chen, Z.; Li, S.; Liu, S.; Li, J. *ChemSusChem,* **2018**, *11*, 11.

[4] Liu, J.; Li, R.; Yang, B. *ACS Cent. Sci.* **2020**, *6*, 2179. **[5]** Yang, X.; Zhuo, Y.; Zhu, S.; Luo, Y.; Feng, Y.; Dou, Y. *Biosens. Bioelectron.* **2014**, *60*, 292.

Acknowledgments: The authors acknowledge FCT-Fundação para a Ciência e a Tecnologia (Base Fund UIDB/00674/2020 and Programmatic Fund UIDP/00674/2020, Portuguese Government Funds), Secretaria Regional de Educação, Ciência e Tecnologia, through ARDITI-Agência Regional para o Desenvolvimento da Investigação Tecnologia e Inovação, and the Programa de Cooperación Territorial INTERREG Iv2Mac project (MAC/4.6d/229). F. P. acknowledges the financial support of Direção Regional de Juventude through the program Ingress@, and of Instituto de Emprego da Madeira through the program EPAP-Estágios Profissionais para a Administração Pública with the reference 2022/EPAP/1777.

[O-04]

Assess the potential of urinary volatilomic pattern of COVID-19 patients infected by SARS-CoV-2. An exploratory study

Giulia Riccio[1,2], Joana Lira[3], Cristina V. Berenguer[3], Cristina P. Ornelas[4], Rafaela Fernandes[5], Viviana Greco[1,2], Rosa Perestrelo[3], Jorge A.M. Pereira[3] & José S. Câmara[1,6,*]

[1] Department of Basic Biotechnological Sciences, Intensivological and Perioperative Clinics, Univesità Cattolica del Sacro Cuore, 00168 Rome, Italy
[2] Department of Diagnostic and Laboratory Medicine, Unity of Chemistry, Biochemistry and Clinical Molecular Biology, Fondazione Policlinico Universitario A. Gemelli IRCCS, 00168 Rome, Italy
[3] CQM – Centro de Química da Madeira, Campus da Penteada, Universidade da Madeira, 9020-105 Funchal, Portugal
[4] Centro de Saúde do Bom Jesus, SESARAM EPERAM, Rua das Hortas 67, 9050-024 Funchal. Portugal
[5] SESARAM EPERAM, Hospital Dr. Nélio Mendonça, Avenida Luís de Camões 57, 9004-514, Funchal, Portugal
[6] Departamento de Química, Faculdade de Ciências Exatas e Engenharia, Campus da Penteada, Universidade da Madeira, 9020-105 Funchal, Portugal

*Corresponding author: jsc@staff.uma.pt

Volatilomics, a relatively new research branch of metabolomics, analyses all the volatile organic metabolites (VOMs) in a biological system. The recent advances in this field have shown its importance and utility in a broad spectrum of human disorders and illnesses. After the dramatic situation experienced in the last years for the SARS-CoV-2 pandemic, a comprehensive understanding of the virus and its consequences in the infected individuals is needed. In this regard, the aim of this preliminary study is to map and observe the changes in the urinary volatilome of three different cohorts of individuals: infected subjects in the acute stage during hospitalization (group A, *n* = 21), infected subjects in the recovering period after a month (group B, *n* = 14), and non-infected individuals (group C, *n* = 21). For this purpose, volatilome analysis was performed with gas chromatography-mass spectrometry (GC-MS) after VOMs extraction using solid-phase microextraction in headspace mode (HS-SPME). The identified VOMs belong to several classes of molecules such terpenes, norisoprenoids, ketones, phenols, alcohols, sulphur, carboxylic, furanic compounds, among others. Obtained data were subjected to advanced statistical tools analysis such as partial least-squares discriminant analysis (PLS-DA). Differences in urinary VOMs profiles of infected and healthy subjects were highlighted, and some compounds were proposed as promising biomarkers for SARS-CoV-2 infection diagnostic. Therefore, the number of subjects needs to be expanded to increase the robustness and the predictive power of the statistical method.

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[O-05]

Green Biomaterials (IV): Natural-based Steroid Copolymers with pH/redox Dual Stimuli-Responsive Properties towards Cancer Chemotherapy

Ruilong Sheng

CQM – Centro de Química da Madeira, Universidade da Madeira, Campus da Penteada, 9020-105 Funchal, Portugal.

Corresponding author: ruilong.sheng@staff.uma.pt

It was revealed that many tumor tissues/cells have micro-environments with the co-existence of acidic(low-pH) and bioreductive(redox) conditions. To realize efficient cancer chemotherapy, it is necessary to develop pH/redox-dual stimuli-responsive nanomaterials with good biocompatibility and high drug delivery efficiency for time/spatial-controlled drug release towards cancer treatment **[1]**.

Based on our previous works on natural-based steroid nanomaterials [2,3], in the current work, a well-defined steroid-based block copolymer, PEG-b-P(MASSChol-co-MAN-DCA) with pH-responsive 1,2-dicarboxylic-cyclohexene acid (DCA) and redox-responsive disulfide (SS) linkage, was prepared via RAFT polymerization, followed by Boc-deprotection and side-chain grafting. The copolymer could be assembled into spherical nanomicelles SSMCs with pH/redox-dual responsive manners. Anti-cancer drug doxorubicin (DOX) was encapsulated into the SSMCs via hydrophobic and electrostatic interactions (non-redox-responsive micelles CCMCs as the control). SSMCs/Dox nanocomplexes showed good stability in the physiological environment (pH=7.4), they demonstrated pH-responsibility (negative-positive surface charge conversion) under acidic (pH 6.5) condition and redox-responsibility (disulfide bond cleavage) under bioreductive environment (10 mM GSH), which resulted in SSMCs/Dox micellar dissociation and accelerated drug release. By contrast, CCMCs/Dox micelles did not show such pH/redox dual-responsive property. Additionally, the SSMCs/DOX nanomicelles exhibited controllable drug delivery manners, proliferation inhibition against MCF-7 breast cancer cells, as well as an obvious “lysosome escape” effect. The results demonstrated the therapeutical potential of SSMCs/DOX nanomicelles as smart nanoplatforms for effective cancer chemotherapy **[4]**.

References: [1]. a). Shi, J.; Kantoff, P.W.; Wooster, R.; Farokhzad, O.C. *Nat. Rev. Cancer,* **2017**, *17*, 20.; b) Chen, M.; Liu, D.; Liu, F.; Wu, Y.; Peng, X.; Song, F. *J. Control. Release,* **2021**, *332*, 269. **[2]**. Wang, Z.; Luo, T.; Sheng, R.; Li, H.; Sun, J.; Cao, A. *Biomacromolecules,* **2016**, *17*, 98. **[3]**. Wang, Z.; Luo, T.; Cao, A.; Sun, J.; Jia, L.; Sheng, R. *Nanomaterial,s* **2018**, *8*, 136. **[4]**. Wang, Z.; Guo, X.; Hao, L.; Zhang, X.; Lin, Q.; Sheng, R. *Materials,* **2022**, *15*, 6476.

Acknowledgments: We thank FCT-Fundação para a Ciência e a Tecnologia (Base Fund UIDB/00674/2020 and Programmatic Fund UIDP/00674/2020, Portuguese Government Funds), Secretaria Regional de Educação, Ciência e Tecnologia, through ARDITI-Agência Regional para o Desenvolvimento da Investigação Tecnologia e Inovação, and FCT-Individual Employment Grant: 2021.00453.CEECIND.

[O-06]

Aromatic herbs – from Mediterranean cuisine to allies in pest control

Rui Ferreira & Paula C. Castilho*

CQM – Centro de Química da Madeira, Universidade da Madeira, Campus da Penteada, 9020-105 Funchal, Portugal

*Corresponding author: pcastilho@staff.uma.pt

Mediterranean cuisine has as rich history and tradition for the use of aromatic herbs and buds. Literature surveys [1,2,3] shows that some commercial species are highly valuable for insecticide and antifungal activities, due to extremely specific and active secondary metabolites. In this study, essential oils (EO) from four species with widespread application – *Origanum vulgare*, *Thymus vulgaris*, *Syzygium aromaticum* and *Ocimum gratissimum* were extracted by hydrodistillation with a Clevenger-type apparatus. The essential oils obtained were subjected to GC-FID quantification and high-resolution ^{1}H and ^{13}C NMR spectroscopy for characterization of bioactive compounds. For *in vivo* screening of fungicidal activity, two methodologies were employed: moisture chamber isolation for obligatory parasites such as members of *Erysiphaceae* family associated with powdery mildew disease, and agar diffusion for borne pathogens of plants (*Fusarium oxysporum*; *Alternaria alternata* and *Botrytis cinerea*). The fungicidal action was evaluated for volatiles and essential oils, using a concentration gradient of essential oils at different solvent formulations, and homogenized in PGA medium at different concentrations. For positive control, a commercial phytofungicide (ARAW™) was used. The antifeeding bioassay was based on leaf-disk election bioassay using essential oil, prepared at stock concentration in EtOH. The pathogen corresponds to the fifth growth stage of *Chrysodeixis chalcites* larvae. The essential oils obtained from *T vulgaris* and *O vulgare* were dominated by monoterpenoid phenol derivatives of p-cymene: thymol and carvacrol, corroborated by NMR characterization. As for *O vulgare*, the major component identified was carvacrol (73,04%). *T vulgaris* EO is characterized for its high content in thymol (89,50%). EO obtained from *S aromaticum* and *O gratissimum* are rich in eugenol (67,48% and 94,55% respectively), a phenylpropanoid and a member of phenols. Results indicate that mycelial grow for *Erysiphaceae* specimens were hindered with a minimum inhibitory concentration (MIC) of 20 µg/ml for *O vulgare*, 10 µg/ml for *T vulgaris* and 2,5 µg/ml for *S aromaticum*. The antifeeding rate was evaluated, with S *aromaticum* and *O gratissimum* with strong antifeeding activity and *T vulgaris* and *O vulgare* characterized as appetite suppressants. Therefore, present results indicated that thymol and especially eugenol rich chemotype plants could be considered as alternative to conventional fungicides.

References: [1] Abdel-Tawab H. Mossa. *J. Environ. Sci. Technol.*, **2016**, 9, 354. **[2]** Nazzaro, F.; Fratianni, F.; Coppola, R.; Feo, V.D. *Pharmaceuticals*, **2017**, 10, 86. **[3]** Zhang, J.; Ma, S-; Du, S.; Chen, S.; Sun H. *J Food Sci Technol.*, **2019**, *56*, 2611.

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[O-07]

The effect of nitrogen and sulfur-based precursors on the synthesis and optical properties of carbon dots

Ivo Martins & João Rodrigues*

CQM-Centro de Química da Madeira, Universidade da Madeira, Campus da Penteada, 9020-105, Funchal, Portugal

*Corresponding author: joaor@uma.pt

Carbon dots (CDs) are nanosized particles ranging from 2-20 nm exhibiting unique photophysical properties, such as multi-color emission and high quantum yields, as well as water-solubility, surface functionality, and low cytotoxicity.[1] The preparation of CDs with the desired properties involved different aspects, namely the type of synthesis method, solvent, reaction time, and temperature.[2] Moreover, the starting precursor is crucial, with the nitrogen and sulfur-based precursors being the preferred ones to reach CDs with enhanced photoluminescence (PL) properties for biomedical and sensor applications.[2,3] In this work, the effects of several nitrogen and sulfur-based precursors on the synthesis and optical properties of CDs were studied. The CDs were synthesized using the hydrothermal method, combining ascorbic acid with N/S-precursors and optimized reaction conditions. The crude material was carefully purified, and the final solutions were lyophilized for yield and characterization purposes. The optical properties of the purified material were determined by UV-Visible and PL spectroscopies, showing UV-absorption and blue/green fluorescence and acceptable quantum yields. Moreover, NMR and FT-IR were used to characterize CDs' internal structure and surface. Finally, the morphology and ζ-potential of the prepared CDs were studied by TEM and DLS. Our results confirm that the use of rich N/S-precursors can improve the photoluminescence properties of CDs by 2-fold.

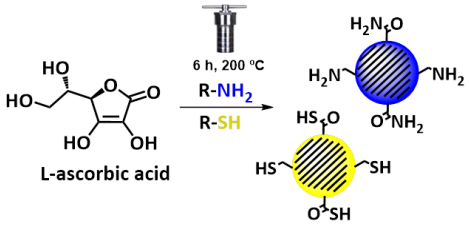

Figure 1. Hydrothermal synthesis of CDs using N, S-precursors.

References: [1] Cayuela, A.; Soriano, M. L.; Carrillo-Carrión, C.; Valcárcel, M., *Chem. Commun*. **2016**, 52, 1311. **[2]** Đorđević, L.; Arcudi, F.; Cacioppo, M.; Prato, M. A., *Nat. Nanotechnol*. **2022**, 17, 112. **[3]** Li, L.; Dong, T., *J. Mater. Chem. C.,* **2018**, 6, 7944.

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[O-08]

Hesperidin as a potential biopesticide for environmental applications: extraction, purity determination, and formulation

Verónica Pereira, Onofre Figueira & Paula C. Castilho*

CQM – Centro de Química da Madeira, Universidade da Madeira, Campus da Penteada, 9020-105, Funchal, Portugal

*Corresponding author: pcastilho@staff.uma.pt

Pesticide overuse on agriculture systems have resulted in pest resistance, soil microbiota impoverishment, loss of water quality, and human health issues. Farmers still depend heavily on these agrochemicals for economically viable production. Researchers and farmers have worked together to adopt new agricultural strategies that do not compromise environmental and human health, and economic profitability. Botanical pesticides, a subclass of biochemical biopesticides, have attracted attention as suitable alternatives to traditional pesticides owing to their biodegradability and low toxicity. Flavonoids have been extensively studied for this purpose because of their involvement in plant defence responses against insects and pathogens. One of these interesting molecules is hesperidin, whose bactericidal and insecticidal activities have been studied either alone or in coordination complexes. This glycosylated flavanone is mainly isolated from citrus through non-selective and time-consuming conventional extraction techniques that use organic solvents.

The current master thesis focuses on developing a consecutive extraction of hesperidin and pectin from citrus waste following the principles of green chemistry and circular economy, on assessing the purity of extracted hesperidin by quantification by nuclear magnetic resonance (qNMR), and on immobilizing this molecule on polysaccharides to provide a sustainable release system for environmental applications.

The optimized consecutive extraction methodology gave high hesperidin yields (1.07 ± 0.08%) and purity (84.01% determined by HPLC-PDA), without needing further purifications steps. The purity of standard and extracted hesperidin by qNMR showed satisfactory results, although further method optimization may be needed.

Different hesperidin concentrations were tested to evaluate the most advantageous particle for environmental applications. The hydrodynamic size and zeta potential of the obtained pectin-hesperidin particles were characterized using dynamic light scattering, and their encapsulation efficiencies and antioxidant activity were determined. The most stable and advantaged particle for environmental applications will be further characterized by release studies *in vitro*, stability tests, soil-plot, and biopesticide activity against the fungal genus *Botrytis*.

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[O-09]

Development of Laponite® gels for cisplatin delivery

Ana Duarte, João Rodrigues & Helena Tomás*

CQM – Centro de Química da Madeira, Universidade da Madeira, Campusda Penteada, 9020-105 Funchal, Portugal.

*Corresponding author: lenat@staff.uma.pt

Being one of the most significant and prevalent diseases of our time, cancer remains a major health concern worldwide **[1]**. Despite huge advances in the treatment of its various types, the development of effective therapies capable of destroying cancer cells with minimal side effects remains a significant challenge. Several drugs have been studied for potential therapies over the years, including metallodrugs. Cisplatin, a platinum-containing metallodrug, is especially used in cancer treatment due to its mechanism of action, which involves interference with the cells' DNA **[2]**. The delivery of drugs like cisplatin in tumours has been the focus of a lot of research and several materials have been used for the design of delivery systems. For example, Laponite® is a synthetic nanoclay that can be easily functionalized due to the interactions it can establish with many chemical entities, being also degradable in non-toxic products in the physiological environment **[3]**. Furthermore, Laponite® can form strongly thixotropic gels at higher concentrations which can be explored as a path to deliver a drug such as cisplatin to a tumour.

The main goal of this work was to formulate hydrogels composed by Laponite® for the delivery of cisplatin. These gels are aimed for topical application or, eventually, for direct injection in the tumour site. As such, the preparation of Laponite® hydrogels was first optimized (e.g., different clay concentrations were studied *vs* gelation time and gel consistency) and the gels were then studied to assess their ability to load and release cisplatin (the cisplatin release profile in PBS was established). Furthermore, the gels' cytotoxicity was evaluated *in vitro* in two cell lines, A2780 (human ovarian carcinoma) and its related cell line A2780cisR (resistant to cisplatin). Cytotoxicity studies were carried out using two different approaches which mainly differed regarding the type of contact between the gels and the cells. Preliminary results showed that the gels displayed a sustained release behaviour of cisplatin. Additionally, *in vitro* studies showed that whereas non loaded Laponite® gels promoted cells' viability, gels containing cisplatin were cytotoxic in a concentration-dependent manner.

References: [1] Siegel, R.L.; Miller, K.D.; Fuchs, H.E.; Jemal, A. *CA Cancer J Clin*., **2021**, 71, 7. **[2]** Rottenberg, S.; Disler, C.; Perego, P. *Nat Rev Cancer*. **2021** ¸21, 37. **[3]** Tomás, H.; Alves, C.S.; Rodrigues, J. *Nanomedicine*. **2018**, 14, 2407.

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[O-10]

The impact of *Arundo donax* leaf-derived nanocellulose formulation on the mustard plant growth

Jaison Jeevanandam & João Rodrigues*

CQM – Centro de Química da Madeira, Universidade da Madeira, Campus da Penteada, 9020-105 Funchal, Portugal.

*Corresponding author: joaor@uma.pt

Growth of plants is essential in agriculture, for which chemical and natural fertilizers are utilized to improve the plant (crop) growth to meet their commercial and populational demand [1, 2]. Chemical fertilizers enhance plant growth on par to meet commercial production. However, they may lead to toxic reactions in the environment due to the existence of hazardous chemicals **[3]**. Contrarily, natural fertilizers are non/less toxic to the environment. Nevertheless, their benefits for commercial agriculture industry are limited due to the low yield of plants **[4]**. It can be noted that the low plant yield, while using natural fertilizers can be attributed to their rapid degradability in soil and lack of prolonged nutrient release ability **[5]**. Among natural fertilizers, celluloses have been reported to possess enhanced fertilizer properties via excellent adsorption (nutrients and water) capacity **[6]**. Therefore, this present study aims to utilize the nanocellulose (fibre-shaped with ca. 91.2 nm) synthesized via *Arundo donax* plant leaves (an invasive plant species in Madeira Island) as a potential nutrient absorbent. Further, the resultant nanocelluloses from *Arundo donax* plant leaves were formulated in a novel ballistic gelatin hydrogel (swelling of 3% higher than pure gelatin) and sodium polyacrylate from the diapers (4.8% higher swelling percentage) to exhibit enhanced nanocellulose release kinetics for 3 days. These samples were utilized as a growth booster of mustard plants and the study was optimized using Design Expert®. The preliminary optimization results showed that the gelatin-nanocelluose formulation can improve the seed germination for up to 40% of mustard plant in four days with less water, compared to control and sodium polyacrylate-nanocellulose samples.

References: **[1]** Daramola, D. A.; Hatzell, M. C. *ACS Energy Lett*. **2023**, 8, 1493. **[2]** Chew, K.W.; Chia, S.R.; Yen, H.-W.; Nomanbhay, S.; Ho, Y.-C.; Show, P.L. *Sustainability* **2019**, *11*, 2266. **[3]** Ali, H.; Khan, E.; Ilahi, I. *J. Chem.* **2019**, 1. **[4]** Dessie, W.; Luo, X.; Wang, M.; Feng, L.; Liao, Y.; Wang, Z.; Yong, Z.; Qin, Z. *Appl Microbiol Biotechnol*. **2020**, 104, 4757. **[5]** Shaji, H.; Chandran, V.; Mathew, L *Controlled Release Fertilizers for Sustainable Agriculture. Academic Press*. **2021**, 231. **[6]** Guo, Y.; Guo, R.; Shi, X.; Lian, S.; Zhou, Q.; Chen, Y.; Weifeng, L.; Li, W. *Int. J. Biol. Macromol.* **2022**, 209, 1169.

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[O-11]

Stabilization of *Lactiplantibacillus plantarum* WCFS1 during freezing, freeze-drying, and storage using legume wastewater extracts containing galacto-oligosaccharides

Gonçalo N. Martins[1], Maria Guerrero Sanchez[2], Angela D. Carboni[3], Fernanda Fonseca[4], Sonia Campoy[2], Andrea Gómez-Zavaglia[3] & Paula C. Castilho[1]*

[1] CQM – Centro de Química da Madeira, Universidade da Madeira, Campus da Penteada, 9020-105 Funchal, Portugal.
[2] R&D Department, Biosearch S.A.U (a Kerry® Company), 18004 Granada, Spain.
[3] Center for Research and Development in Food Cryotechnology (CIDCA, CCT-CONICET La Plata) La Plata RA1900, Argentina.
[4] UMR SayFood, Université Paris-Saclay, INRAE, AgroParisTech, 91120 Palaiseau, France.
*Corresponding author: pcastilho@staff.uma.pt

The soaking and cooking wastewaters obtained from the treatment of legumes before consumption represents a form of environmental pollution and loss of valuable resources. These wastewaters are rich in galacto-oligosaccharides (GOS) that are known for their prebiotic potential. They can also be used to stabilize and protect bacteria during preservation processes (freezing and freeze-drying) and during storage, increasing their shelf-life. In this work, the cryoprotective potential of chickpea and lentils wastewaters was assessed towards *Lactiplantibacillus plantarum* WCFS1, a probiotic lactic acid bacteria strain.

Chickpea (*Cicer arietinum* L.) and lentil (*Lens culinaris* M.) seeds with and without soaking were cooked for 30 min to obtain GOS-rich wastewaters. Their carbohydrate composition was determined with High Performance Liquid Chromatography with Refractive Index detection.

Lactiplantibacillus plantarum WCFS1 was grown in de Man, Rogosa, and Sharpe (MRS) medium, and was then used for fermentation in a 5 L bioreactor. 10 g of protective solution was added to 5 g of biomass and the mixtures were frozen at -80°C. They were then lyophilized for 48 h. Protected dried cells were stored at 25°C and 37°C. Culturability measurements (CFU/mL) in MRS agar and acidifying activity assessments (dtpH1.5) by CINAC method were performed before freezing and after freezing, lyophilization, and storage. Sucrose and a commercial FOS mixture (Beneo Orafti) were used as cryoprotection reference materials.

As expected, CFU/mL values decreased in all samples in similar proportion after each step and, consequently, the dtpH1.5 values increased accordingly, and GOS extracts showed comparable protection potential as the reference materials assayed throughout all cryoprotection steps.

This work demonstrates GOS wastewaters from legume processing have the potential to be included in the industrial production of probiotic LAB for its stabilization during storage minimizing waste production and environmental impact and maximizing economic gain.

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[O-12]

Polyester-based dendritic block copolymers with biodegradable properties for potential cancer treatment

Fátima Mendes[1], Natalia Sanz del Olmo[2], Jorge San Jacinto Garcia[2], Michael Malkoch[2] & Helena Tomás[1]*

[1] CQM – Centro de Química da Madeira,Universidade da Madeira, Campus da Penteada, 9020-105, Funchal, Portugal.
[2] Department of Fibre and Polymer Technology, School of Chemical Science and Engineering, Fibre and Polymer Technology, KTH Royal Institute of Technology, Stockholm, Sweden.
*Corresponding author: lenat@staff.uma.pt

Cancer is one of the most prevalent diseases and one of the leading causes of death worldwide. According to the International Agency for Research on Cancer, in 2020 there were 19.3 million new cases of cancer, with an estimated 9.9 million cancer-related deaths **[1]**. The chemotherapeutic treatment of cancer, though effective to some extent, presents disadvantages, particularly regarding the side effects, often due to the non-specific action of the drugs that lead to a generalized toxicity in the organism. Hence, research for the development of novel treatments is required, namely through the development of nanoscale vehicles capable of carrying conventional drugs.

With that intent, biodegradable polyester-based dendritic block copolymers were prepared and loaded with cisplatin, a drug used for the treatment of multiple cancer types, for example osteosarcoma, the most common bone cancer that affects mostly people up to the age of 19 **[2]**.

The drug-loaded systems, as well as their precursors were synthesized and then characterized through various techniques, namely nuclear magnetic resonance (NMR), mass spectrometry (MALDI-TOF), scanning electron microscopy with Energy Dispersive X-Ray Analysis (SEM/EDX), transmission electron microscopy (TEM), Fourier-transform infrared spectroscopy (FT-IR), size exclusion chromatography (SEC), and dynamic light scattering (DLS). The *in vitro* biological activity of these systems is also under evaluation in relevant cell line models, specifically their cytotoxic behaviour before and after drug loading.

References: [1] Ferlay, J.; Colombet, M.; Soerjomataram, I.; Parkin, D.M.; Piñeros, M.; Znaor, A.; Bry, F. *Int J Cancer*. **2021**, 149, 778. **[2]** Whelan, J.; Seddon, B.; Perisoglou, M. *Curr Treat Options Oncol*. **2006**, 7, 444.

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[O-13]

Purification of galacto-oligosaccharides by enzymatic reaction with glucose oxidase

Javier González[1], Gonçalo N. Martins[2], Andrea Gómez-Zavaglia[3] & Paula C. Castilho[2*]

[1] EEI UVigo- Escola de Enxeñería Industrial, Universidad de Vigo, Vigo, Spain.
[2] CQM - Centro de Química da Madeira, Universidade da Madeira, Campus da Penteada, 9020-105 Funchal, Portugal.
[3] Center for Research and Development in Food Cryotechnology (CIDCA, CCT-CONICET La Plata) La Plata RA1900, Argentina.

*Corresponding author: pcastilho@staff.uma.pt

Currently the development and research of healthy substances is constantly increasing. Compounds such as galacto-oligosaccharides (GOS) have been found to have a prebiotic effect on human health. **[1]** These compounds can be obtained from natural products that are currently considered as waste such as chickpea cooking water. These mixtures often contain monosaccharides which must be eliminated since they reduce GOS' prebiotic potential. **[2]** The most used methods to eliminate monosaccharides are fermentation or enzymatic reaction. In this work, enzymatic reaction using Decazyme GO® (Nutring S.A., Argentina), an enzyme with glucose oxidase activity was optimized to remove glucose from Vivinal® GOS Syrup (Vivinal®, FrieslandCampina, The Netherlands) transforming it into gluconic acid. Vivinal® is a commercial GOS mixture that has glucose present, so it is an interesting reference material.

From the starting experimental conditions – reaction of 2% Decazyme GO with 1% Vivinal® solutions at pH 5.5 for several hours at 40°C – the enzymatic reaction was optimized towards the pH, the use of buffers, Vivinal® concentration, temperature, and enzyme concentration. The outcome of the enzymatic reaction was evaluated by High-Performance Liquid Chromatography with Refractive Index (HPLC-RI) detection, by following glucose consumption and gluconic acid formation.

The HPLC-RI analysis showed that in a reaction system with sodium acetate-acetic acid buffer with pH 5.5 almost all glucose (96%) was eliminated in less than two hours, and that increasing the reaction temperature positively influenced its success.

References: **[1]** Martins, G.N.; Ureta, M.M.; Tymczyszyn, E.; Castilho, P.; Gómez-Zavaglia, A. *Front Nut*. **2019**, 6, 78. **[2]** Aburto, C.; Guerrero, C.; V.era, C.; Wilson, L.; Illanes, A. *Enzyme Microb. Technol*. **2018**, 118, 102.

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[O-14]

Membranes for biomedical applications: Investigating the potential of pectin and chitosan

Onofre Figueira & Paula C. Castilho*

CQM – Centro de Química da Madeira, Universidade da Madeira, Campus da Penteada, 9200-105 Funchal, Portugal

*Corresponding author: pcastilho@staff.uma.pt

Pectin and chitosan are two natural polysaccharides that have received a lot of attention from researchers. Pectin is found in plant cell walls, whereas chitosan, a chitin derivative, can be obtained from crustacean exoskeletons, and both have potential applications in biomedical, agricultural, and food packaging fields. Polyelectrolyte complexes (PEC) are formed by the conjugation of these polymers and are known for their bioavailability and biocompatibility. They have arisen the interest of scientists due to their potential applications in wound healing, drug delivery, and tissue engineering.

The current study focused on the development of pectin-chitosan and pectin-chitosan-wax PEC membranes for biomedical applications using a solvent-casting method. Beeswax and carnauba wax were the two types of wax tested. Various ratios and formulations were tested to determine which produced the best hydrogel consistency and mechanical properties. The thickness, moisture content, and water contact angle of the membranes were determined, as well as the water vapor barrier by the "cup method," swelling degree, solubility, and FTIR-UATR analyses were performed.

Pectin:Chitosan conjugations exhibited more "plastic" properties, whereas Pectin:Chitosan:Wax conjugations exhibited greater thickness and malleability, an higher water contact angle, a lower swelling degree, and a lower moisture content. The study shed light on the potential of pectin-chitosan and pectin-chitosan-wax conjugations as drug release matrices. Depending on the final biomedical application, the final membrane can be tailored by adjusting the polymeric or wax ratios.

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[O-15]

Transfection studies of oxidized fluorinated generation four PAMAM dendrimers

Lydia dos Orfaos, Helena Tomás & João Rodrigues*

CQM – Centro de Química da Madeira, Universidade da Madeira, Campus da Penteada, 9020-105 Funchal, Portugal.

*Corresponding author: joaor@uma.pt

The treatment of diseases and the cure for most infirmities is mainly due to the early diagnosis and subsequent follow-up of the illness in each patient. The process of diagnosis involves several steps, which include pathology and medical imaging or radiology. Radiology employs imaging techniques, such as magnetic resonance imaging (MRI). It is also used to plan and select treatments as well as to monitor their effectiveness, providing long-term follow up**[1]**. A minimally invasive image-guided diagnosis and treatment is very advantageous. A vector that can be tracked and deliver genes or drugs to a specific location will combine the diagnosis and treatment in one step.

Following previous work, fluorinated generation four of poly(amidoamine) dendrimer ($PAMAMG_4$-NH_2) conjugated with 2,3,5,6-tetrafluoro-4-hydroxybenzoic acid (TFHBA) were oxidized using ammonium persulfate (APS) at three different concentrations following a methodology used by our group**[2]**. This oxidation process was performed to take advantage of the non-traditional intrinsic luminescence (NTIL)**[3]** of the PAMAM dendrimer and maintain the possibility of nuclear magnetic resonance (NMR) by ^{19}F NMR detection. The resulting was characterized by NMR, FTIR, UV/Visible, and Photoluminescence. Photoluminescence studies showed strong blue fluorescence under UV lamp with an increase in the APS concentration. Cytotoxicity and transfection studies were conducted to evaluate the vector's ability to deliver genes. The results indicate that the oxidized fluorinated dendrimer, trackable by ^{19}F NMR, can transfect cells *in vitro*.

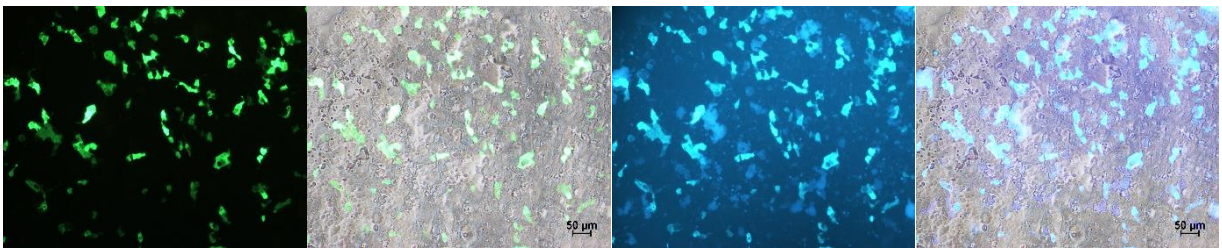

Figure 1: Fluorescence microscopy of G4TFHBA16.5 0.05MAPS 2.0 µM. Green and blue field.

References: [1] Balogh, E.P.; Miller, B.T.; Ball, J.R. *Improving Diagnosis in Health Care*. **2016**. **[2]** Camacho, C.; Urgelles, M.; Tomás, H.; Lahoz, F.; Rodrigues, J. *J. Mater. Chem. B.* **2020**, 8, 10314. **[3]** Konopka, M.; Janaszewska, A.; Klajnert-Maculewicz, B. *Polymers (Basel)*. **2018**, 10, 540.

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[O-16]

Interdelta polymorphism analysis for identification of *Saccharomyces cerevisiae* strains

Mariangie M. Castillo[1], Nikol Parra[1], José S. Câmara[1,2] & Mahnaz Khadem[3,*]

[1] CQM – Centro de Química da Madeira, Universidade da Madeira, Campus da Penteada, 9020-105 Funchal, Portugal
[2] Departamento de Química, Faculdade de Ciências Exatas e Engenharia, Universidade da Madeira, Campus Universitário da Penteada, 9020-105 Funchal, Portugal
[3] Banco de Germoplasma –ISOPlexis. Universidade da Madeira, Campus Universitário da Penteada, 9020-105 Funchal, Portugal.
*Corresponding author: mkhadem@staff.uma.pt

Saccharomyces cerevisiae is historically used in the production of fermented foods, namely wine, beer, and bread. It is the study model in research, and the base of the knowledge of the biology of eukaryotic cells. Actually, it is used also in the industry for the production of biofuel, and drugs, among others. Europe produces 1 million tons/year of *S. cerevisiae*, from which around 1/3 is exported, and its production has incremented in the last years **[1]**.

The skills for the high-quality value products concerns to genetical performance of each strain **[1]**, in this sense, the *interdelta* polymorphism approach represents a practical tool for strain identification. *Interdelta* elements are a short sequence along of genome, whose number and position depend on the strain of *S. cerevisiae*. Therefore, *interdelta* regions amplification, and analysis of *interdelta* fragment pattern constitute an approach for the *S. cerevisiae* strain identification **[2]**.

The aim of the present study is the molecular identification of commercial *S. cerevisiae* strains through *interdelta* polymorphism. In this sense, 10 *S. cerevisiae* strains, two polymerase chain reaction (PCR) amplification conditions and two primers pairs were tested. Both primer pairs showed to be equivalent, resulting in 6 *interdelta* patterns. The result can be related to the sensibility of the technique, or the genetic proximity of the analysed strain. Thereby, more deep research including more strains could be a useful approach for the targeted objective.

References: [1] Parapouli, M.; Vasileiadis, A.; Afendra, A.S.; Hatziloukas, E. *AIMS Microbiol.* **2020**, 6, 1. **[2]** Legras, J.L.; Karst, F. FEMS *Microbiol. Lett*. **2003**, 221, 249.

Acknowledgments: A special acknowledgement to the local vintner Miguel Caldeira for supplying the samples used in this work. This work was supported by FCT-Fundação para a Ciência e a Tecnologia (Base Fund UIDB/00674/2020 and Programmatic Fund UIDP/00674/2020, Portuguese Government Funds), Secretaria Regional de Educação, Ciência e Tecnologia, through ARDITI-Agência Regional para o Desenvolvimento da Investigação Tecnologia e Inovação, and PhD ARDITI Grant - SFRH/BD/147434/2019.

[O-17] *Additional communication*

New dendritic ruthenium-based anticancer nanosystems: theoretical multi-step synthesis procedures coming to life

Nádia Nunes[1], Xiangyang Shi[1,2] & João Rodrigues[1*]

[1]CQM – Centro de Química da Madeira, Universidade da Madeira, Campus da Penteada, 9020-105 Funchal, Portugal.
[2]College of Chemistry, Chemical Engineering and Biotechnology, Donghua University, Shanghai, China.
*Corresponding author: joaor@uma.pt

Uncovering new potent anticancer drugs (IC50 < 4 μM) with excellent PK/PD behavior and marketable at reasonable prices remains urgent. The revolutionary interplay of nanotechnology and chemotherapy enabled us [1] to synthesize and incorporate a promising ruthenium-based anticancer drug (RuCp) onto polynitrile Poly(alkylidenimine) and PAMAM dendritic scaffolds, producing two new families of metallodendrimers as pre-clinical anticancer candidates with potent antitumor efficacy, specificity to a broad set of tumors, and good biosafety.

To prepare novel potent anticancer drugs with the advantages described above but with increased stability for long-term stable clinical formulations, two multi-step synthesis procedures were designed to obtain new acetylide RuCp-PAMAM metallodendrimers and dendrons. Our objective encompasses the treatment of drug-resistant tumors and the simultaneous imaging of such tumors. Therefore, it was proposed to synthesize a novel hybrid dendritic nanosystem grafting the RuCp-acetylide PAMAM dendrons into gold nanoclusters (Ru(II)-AuNCs) for synergistic photothermal-chemotherapy (Fig. 1). Both dendritic families have similar PAMAM-based polyacetylide scaffolds obtained by the divergent method and quantitatively coordinated to the RuCp metallofragment. The Ru(II)-AuNCs are proposed to be prepared by the convergent method.

So far, we have prepared the acetylide RuCp metallodendrimer with eight terminal groups (G_0-CCRu) after optimizing six sequential reactions and isolating four dendrimers during the process (G_0-Boc, G0-OH, G_0-6BrPy, G_0-CCH). In parallel, four dendrons were prepared to achieve the second goal: $G_{0.5}$-D1, $G_{0.5}$-D2, $G_{0.5}$-D3, and G_0-D1. All the compounds were characterized by 1D/2D-NMR, FTIR, and MALDI-TOF MS. We will continue advancing in the multi-step synthetic sequence to obtain the Ru(II)-AuNCs, starting with the *in vitro* validation of the active compounds.

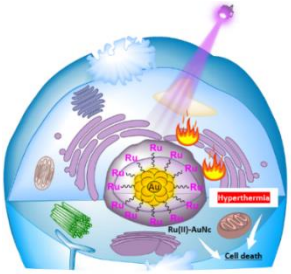

Figure 1: Cancer's cell death mechanism after applying synergistic photothermal-chemotherapy with Ru(II)-AuNC.

References: [1] D. Maciel, N. Nunes, F. Santos, Y. Fan, G. Li, M. Shen, H. Tomás, X. Shi, J. Rodrigues, *J. Mater. Chem. B*, **2023**, 10, 8945; **[2]** M. Gouveia, J. Figueira, M. G. Jardim, R. Castro, H. Tomás, K. Rissanen, J. Rodrigues, *Molecules*, **2018**, 23, 1471..

Acknowledgments: This research was supported by FCT - Fundação para a Ciência e a Tecnologia - through the CQM Base Fund UIDB/00674/2020, Programmatic Fund UIDP/00674/2020, and by the Ph.D. grant 2020.04679.BD (N.N.). The support of Secretaria Regional de Educação, Ciência e Tecnologia, through ARDITI - Agência Regional para o Desenvolvimento da Investigação Tecnologia e Inovação - is genuinely appreciated.

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PUBLICATIONS 2022/23

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1. Hassoun, A.; Siddiqui, S. A.; Smaoui, S.; Ucak, İ.; Arshad, R. N.; Bhat, Z. F.; Bhat, H. F.; Carpena, M.; Prieto, M. A.; Aït-Kaddour, A.; **Pereira, J. A. M.**; Zacometti, C.; Tata, A.; Ibrahim, S. A.; Ozogul, F.; **Câmara, J.S.** Emerging Technological Advances in Improving the Safety of Muscle Foods: Framing in the Context of the Food Revolution 4.0 *Food Rev. Int.* **2022**, 1-42. (IF: **6.043**) Q1 (Q1 (Food Science & Chemical Engineering (miscellaneous))

2. Thimmiah, B. R.; Chien, B. T. C.; Fui, K. S.; Yon, L. S.; Nallathambi, G.; **Jeevanandam, J.**; Danquah, M. K. Nanoformulation of Peptides for Pharmaceutical Applications: In Vitro and In Vivo Perspectives *Appl. Sci.* **2022**, *12*, 12777-. (IF: **2.838**) Q2 (Engineering – miscellaneous)

3. **Câmara, J.S.**; Locatelli, Monica; **Pereira, J. A. M.**; Oliveira, Helder; **Arlorio, Marco**; Fernandes, Iva; **Perestrelo, R. M. d. S.**; Freitas, Victor; Bordiga, Matteo Behind the Scenes of Anthocyanins-From the Health Benefits to Potential Applications in Food, Pharmaceutical and Cosmetic Fields *Nutrients* **2022**, *14*, 5133-. (IF: **6.706**) Q1 (Food Science & Nutrition and Dietetics)

4. Pei, S.-L.; Zhang, J.; Ge, W.; Liu, C.; **Sheng, R.**; Zeng, L.; Pan, L.-H. A resorufin-based fluorescence probe for visualizing biogenic amines in cells and zebrafish *RSC Adv.* **2022**, *12*, 33870-33875. (IF: **4.036**) Q1 (Chemical engineering)

5. Kim, H. R.; Warrington, S. J.; Lopez-Guajardo, A.; Al Hennawi, K.; Cook, S. L.; Griffith, Z. D. J.; Symmes, D.; Zhang, T.; Qu, Z.; Xu, Y.; Chen, R.; **Gad, A. K. B.** ALD-R491 regulates vimentin filament stability and solubility, cell contractile force, cell migration speed and directionality *Front. Cell. Dev. Biol.* **2022**, *10*, 1-15. (IF: **6.684**) Q1 (Cell biology)

6. Tonge, J. J.; Notley, V. S.; Dunning, M. J.; Lopez-Guajardo, A.; Medcale, J. D.; Heldin, P.; Panoutsos, G.; **Gad, A. K. B.** Hyaluronan nanoscale clustering and Hyaluronan synthase 2 expression are linked to the invasion of child fibroblasts and infantile fibrosarcoma in vitro and in vivo *Sci Rep* **2022**, *12*, 19835 -. (IF: **4.500**) Q1 (Multidisciplinary)

7. González-Gómez, L.; **Pereira, J. A. M.**; Morante-Zarcero, S.; **Câmara, J.S.**; Sierra, I. Green extraction approach based on µSPEed® followed by HPLC-MS/MS for the determination of atropine and scopolamine in tea and herbal tea infusions *Food Chem.* **2022**, *394*, 133512-. (IF: **9.231**) Q1 (Food Science)

8. Tan, K. X.; **Jeevanandam, J.**; **Rodrigues, J. M. C.**; Danquah, M. K. Aptamer-Mediated Antiviral Approaches for SARS-CoV-2 *Front. Biosci.* **2022**, *27*, 306-. (IF: **2.747**) Q2 (Biochemistry, genetics and molecular biology)

9. Cozzolino, Rosaria; **Câmara, J.S.**; Malorni, Livia; Amato, Giuseppe; Cannavacciuolo, Ciro; Masullo, Milena; Piacente, Sonia Comparative Volatilomic Profile of Three Finger Lime (Citrus australasica) Cultivars Based on Chemometrics Analysis of HS-SPME/GC-MS Data *Molecules* **2022**, *27*, 7846-. (IF: **4.927**) Q1 (Organic Chemistry)

10. **Izcara, S.**; **Perestrelo, R. M. d. S.**; Morante-Zarcero, Sonia; Sierra, Isabel; **Câmara, J.S.** Volatilomic fingerprinting from edible flowers. Unravelling some impact compounds behind its attractiveness *Food Biosci.* **2022**, *50*, 102188-. (IF: **5.310**) Q1 (Food Science)

11. **Andrade, C. F. P.**; **Perestrelo, R. M. d. S.**; **Câmara, J.S.** Bioactive Compounds and Antioxidant Activity from Spent Coffee Grounds as a Powerful Approach for Its Valorization *Molecules* **2022**, *27*, 7504-. (IF: **4.927**) Q1 (Organic Chemistry)

12. Sun, H.; Zhan, M.; **Mignani, S. M.**; Shcharbin, D.; Majoral, J.-P.; **Rodrigues, J. M. C.**; **Shi, X.**; Shen, M. Modulation of Macrophages Using Nanoformulations with Curcumin to Treat Inflammatory Diseases: A Concise Review *Pharmaceutics* **2022**, *14*, 2239-. (IF: **6.525**) Q1 (Pharmaceutical Science)

13. Sun, X.; Shen, B.; Yu, H.; Wu, W.; **Sheng, R.**; Fang, Y.; Guo, R. Therapeutic potential of demethylzeylasteral, a triterpenoid of the genus Tripterygium wilfordii *Fitoterapia* **2022**, *163*, 105333-. (IF: **3.204**) Q2 (Pharmacology)

14. Li, X.; Lu, Y.; Kong, L.; **Shi, X.**; Pich, A. Leukocyte-nanomedicine system for targeted delivery and precise theragnostics *Chem* **2022**, *8*, 2591-2593. (IF: **25.832**) Q1 (Chemistry)

15. Terehova, M.; Magiera, J.; Qiu, J.; Majoral, J.-P.; **Shi, X.**; **Mignani, S. M.**; Ionov, M.; Waczulikova, I.; Bryszewska, M.; Shcharbin, D. Effect of amphiphilic phosphorous dendrons on the conformation, secondary structure, and zeta potential of albumin and thrombin *Polym. Bull.* **2022**, 1-. (IF: **2.843**) Q3 (Materials Science)

16. Coutinho, A. J.; Pinheiro, M.; **Neves, Ana Rute**; Pinto, M. M. M. Therapeutic potential of genistein: preclinical studies, clinical evidence, and nanotechnology application *Curr. Med. Chem.* **2022**, 1-. (IF: **4.740**) Q2 (Organic Chemistry)

17. **Maciel, D.**; **Nunes, N. S. H.**; **Santos, F.**; Fan, Yu; Li, Gaoming; Shen, Mingwu; **Tomás, H.** ; **Shi, X.**; **Rodrigues, J. M. C.** New insights into ruthenium(ii) metallodendrimers as anticancer drug nanocarriers: from synthesis to preclinic behaviour *J. Mat. Chem. B* **2022**, *10*, 8945-8959. (IF: **7.571**) Q1 (Chemistry, Materials Science, Medicine)

18. Anboo, S.; Lau, S. Y.; Kansedo, J.; Yap, P.-S.; Hadibarata, T.; **Jeevanandam, J.**; Kamaruddin, A. H. Recent advancements in enzyme-incorporated nanomaterials: Synthesis, mechanistic formation, and applications *Biotechnol. Bioeng.* **2022**, *119*, 2609-2638. (IF: **4.395**) Q2 (Applied Microbiology and Biotechnology)

19. **Izcara, S.**; **Perestrelo, R. M. d. S.**; Morante-Zarcero, Sonia; Sierra, Isabel; **Câmara, J.S.** Spices Volatilomic Fingerprinting-A Comprehensive Approach to Explore Its Authentication and Bioactive Properties *Molecules* **2022**, *27*, 6403-. (IF: **4.927**) Q1 (Organic Chemistry)

20. Ye, H.; Ke, Y.; Yue, C.; Xie, P.; **Sheng, R.**; Zeng, L. 5G smartphone-adaptable fluorescence sensing platform for simultaneous detection of toxic formaldehyde and phosgene in different emission channels *Dyes Pigment.* **2022**, *207*, 110782-. (IF: **5.122**) Q1 (Chemical engineering)

21. **González-Gómez, L**; Morante-Zarcero, S.; **Pereira, J. A. M.**; **Câmara, J.S.**; Sierra, I. Improved Analytical Approach for Determination of Tropane Alkaloids in Leafy Vegetables Based on mu-QuEChERS Combined with HPLC-MS/MS *Toxins* **2022**, *14*, 650-. (IF: **5.075**) Q2 (Toxicology & Health, Toxicology and Mutagenesis)

22. Wang, Z.; GuO, X.; Hao, L.; Zhang, X.; Lin, Q.; **Sheng, R.** Charge-Convertible and Reduction-Sensitive Cholesterol-Containing Amphiphilic Copolymers for Improved Doxorubicin Delivery *Materials* **2022**, *15*, 6476-. (IF: **3.748**) Q2 (Material science)

23. Shaebani, M. R.; Stankevicins, L.; Vesperini, D.; Urbanska, M.; Flormann, D. A. D.; Terriac, E. ; **Gad, A. K. B.**; Cheng, F.; Eriksson, J. E.; Lautenschläger, F. Effects of vimentin on the migration, search efficiency, and mechanical resilience of dendritic cells *Biophys. J.* **2022**, *121*, 3950-3961. (IF: **3.699**) Q1 (Biophysics)

24. **Perestrelo, R. M. d. S.**; Caldeira, M. ; Rodrigues, F.; **Pereira, J. A. M.**; **Câmara, J.S.** DLL mu E/GC-MS as a Powerful Analytical Approach to Establish the Volatilomic Composition of Different Whiskeys *Beverages* **2022**, *8*, 53-. (IF: **0.610**) Q2 (Food Science)

25. Wang, J.; Sun, X.; Li, N.; **Sheng, R.**; Guo, R. An overview of thrombin inhibitors in the perspective of structure-activity relationships *Curr. Med. Chem.* **2022**, *29*, 1-. (IF: **4.740**) Q2 (Organic Chemistry)

26. Li, G.; Guo, Y.; Guo, R.; **Shi, X.**; Shen, M. LAPONITE (R) nanodisk-based platforms for cancer diagnosis and therapy (Jul, 10.1039/d2ma00637e, 2022) *Mater. Adv.* **2022**, *3*, 6742-. (IF: **0.520**) Q3 (Materials Science (miscellaneous))

27. **Câmara, J.S.**; Martins, C.; **Pereira, J. A. M.**; **Perestrelo, R. M. d. S.**; Rocha, S. M. Chromatographic-Based Platforms as New Avenues for Scientific Progress and Sustainability *Molecules* **2022**, *27*, 5267-. (IF: **4.912**) Q1 (Organic Chemistry)

28. **Berenguer, C.**; Pereira, F.; **Pereira, J. A. M.**; **Serina, J.** Volatilomics: An Emerging and Promising Avenue for the Detection of Potential Prostate Cancer Biomarkers *Cancers* **2022**, *14*, 3982-. (IF: **6.575**) Q1 (Oncology)

29. Zhu, B.; **Sheng, R.**; Chen, T.; **Rodrigues, J. M. C.**; Song, Q.-H.; Hu, X.; Zeng, L. Molecular engineered optical probes for chemical warfare agents and their mimics: Advances, challenges and perspectives *Coord. Chem. Rev.* **2022**, *463*, 214527-. (IF: **24.833**) Q1 (Inorganic Chemistry)

30. **Câmara, J.S.**; **Perestrelo, R. M. d. S.**; Olayanju, B.; **Berenguer, C.**; Kabir, A.; **Freitas, J. D. C.** Overview of Different Modes and Applications of Liquid Phase-Based Microextraction Techniques *Processes* **2022**, *10*, 1347-. (IF: **3.352**) Q2 (Chemical Engineering (miscellaneous))

31. **Andrade, C. F. P.**; **Perestrelo, R. M. d. S.**; **Câmara, J.S.** Valorization of Spent Coffee Grounds as a Natural Source of Bioactive Compounds for Several Industrial Applications-A Volatilomic Approach *Foods* **2022**, *11*, 1731-. (IF: **5.561**) Q1 (Food Science)

32. Zhang, J.; Zhao, C.; **Sheng, R.**; Lin, K.; Wang, X.; Zhang, S. Construction of a Hierarchical Micro-/Submicro-/Nanostructured 3D-Printed Ti6Al4V Surface Feature to Promote Osteogenesis: Involvement of Sema7A through the ITGB1/FAK/ERK Signaling Pathway *ACS Appl. Mater. Interfaces* **2022**, *14*, 30571-30581. (IF: **10.383**) Q1 (Material science)

33. Hang, S.; Wu, W.; Wang, Y.; **Sheng, R.**; Fang, Y.; Guo, R. Daphnetin, a Coumarin in Genus Stellera Chamaejasme Linn: Chemistry, Bioactivity and Therapeutic Potential *Chem. Biodivers.* **2022**, *19*, e20220026-. (IF: **2.745**) Q2 (Chemistry)

34. **Jeevanandam, J.**; Pan, S.; **Rodrigues, J. M. C.**; Abd Elkodous, M.; Danquah, M. K. Medical applications of biopolymer nanofibers *Biomater. Sci.* **2022**, *10*, 4107-4118. (IF: **7.590**) Q1 (Biomedical engineering)

35. Hang, S.; Chen, H.; Wu, W.; Wang, S.; Fang, Y.; **Sheng, R.**; Tu, Q. ; Guo, R. Progress in Isoindolone Alkaloid Derivatives from Marine Microorganism: Pharmacology, Preparation, and Mechanism *Mar. Drugs* **2022**, *20*, 405-. (IF: **6.085**) Q1 (Pharmaceutical sciences)

36. Chen, L.; Cao, L.; Zhan, M.; Li, J.; Wang, D.; Laurent, R.; **Mignani, S. M.**; Caminade, A.-M.; Majoral, J.-P.; **Shi, X.** Engineered Stable Bioactive Per Se Amphiphilic Phosphorus Dendron Nanomicelles as a Highly Efficient Drug Delivery System To Take Down Breast Cancer In Vivo *Biomacromolecules* **2022**, *23*, 2827-2837. (IF: **6.978**) Q1 (Materials Science)

37. **Izcara, S.**; **Perestrelo, R. M. d. S.**; Morante-Zarcero, S.; **Câmara, J.S.**; Sierra, I. High throughput analytical approach based on μQuEChERS combined with UHPLC-PDA for analysis of bioactive secondary metabolites in edible flowers *Food Chem.* **2022**, *393*, 133371-. (IF: **9.231**) Q1 (Analytical Chemistry)

38. Nešić, M.D.; Dučić, T.; **Gonçalves, M. I. J.**; Stepić, M.; Algarra, M.; Soto, J.; Gemović, B.; Bandosz, T.J.; Petković, M. Biochemical changes in cancer cells induced by photoactive nanosystem based on carbon dots loaded with Ru-complex *Chem.-Biol. Interact.* **2022**, *360*, 109950-. (IF: **5.168**) Q2 (Pharmacology, Toxicology and Pharmaceutics)

39. Fu, Z.; Zhang, L.; Hang, S.; Wang, S.; Li, N.; Sun, X.; Wang, Z.; **Sheng, R.**; Wang, F.; Wu, W.; Guo, R. Synthesis of Coumarin Derivatives: A New Class of Coumarin-Based G Protein-Coupled Receptor Activators and Inhibitors *Polymers* **2022**, *14*, 2021-. (IF: **4.967**) Q1 (Chemistry)

40. **Câmara, J.S.**; **Perestrelo, R. M. d. S.**; **Berenguer, C.**; **Andrade, C. F. P.**; Gomes, T.M.; Olayanju, B.; Kabir, A.; Rocha, C.M.R. ; Teixeira, J.A.; **Pereira, J. A. M.** Green Extraction Techniques as Advanced Sample Preparation Approaches in Biological, Food, and Environmental Matrices: A Review *Molecules* **2022**, *27*, 2953-. (IF: **4.927**) Q2 (Analytical Chemistry)

41. Dučić, T.; **Alves, C. S. B. A. S.**; Vučinić, Ž.; Lázaro-Martínez, J.M.; Petković, M.; Soto, J.; Mutavdžić, D.; Valle Martínez de Yuso, M.; Radotić, K.; Algarra, M. S, N-doped carbon dots-based cisplatin delivery system in adenocarcinoma cells: Spectroscopical and computational approach *J. Colloid Interface Sci.* **2022**, *623*, 226-237. (IF: **9.965**) Q1 (Materials Science)

42. **Mignani, S. M.**; **Shi, X.**; **Rodrigues, J. M. C.**; **Tomás, H.** ; Majoral, J.-P. Dendrimer nanoplatforms for veterinary medicine applications: A concise overview *Drug Discov. Today* **2022**, *27*, 1251-1260. (IF: **8.369**) Q1 (Pharmacology, Toxicology and Pharmaceutics)

43. Gupta, R.; Sharma, S.; Singh, R.; Vishwakarma, R.A.; **Mignani, S. M.**; Singh, P.P. Functionalized Nitroimidazole Scaffold Construction and Their Pharmaceutical Applications: A 1950–2021 Comprehensive Overview *Pharmaceuticals* **2022**, *15*, 531-. (IF: **5.863**) Q1 (Medicinal Chemistry)

44. Posadas, I.; Romero-Castillo, L.; Ronca, R.-A.; Karpus, A.; **Mignani, S. M.**; Majoral, J.-P.; Munoz-Fernandez, M.; Ceña, V. Engineered Neutral Phosphorous Dendrimers Protect Mouse Cortical

Neurons and Brain Organoids from Excitotoxic Death *Int. J. Mol. Sci.* **2022**, *23*, 4391-. (IF: **6.208**) Q1 (Chemistry)

45. Wang, Z.; Song, W.; **Sheng, R.**; GuO, X.; Hao, L.; Zhang, X. Controlled preparation of cholesterol-bearing polycations with pendent l-lysine for efficient gene delivery *Int. J. Polym. Mater. Polym. Biomat.* **2022**, 1-9. (IF: **2.604**) Q1 (Analytical Chemistry)
46. **Freitas, J. D. C.**; **Perestrelo, R. M. d. S.**; Vaz-Pires, P.; **Câmara, J.S.** Bacterial diversity analysis of coastal superficial seawaters near aquaculture facilities, using MALDI-TOF approach and Ribopeaks database *Aquaculture* **2022**, *556*, 738263-. (IF: **4.242**) Q1 (Aquatic Science)
47. Zhu, Z.; Zhang, L.; **Sheng, R.**; Chen, J. Microfluidic-Based Cationic Cholesterol Lipid siRNA Delivery Nanosystem: Highly Efficient In Vitro Gene Silencing and the Intracellular Behavior *Int. J. Mol. Sci.* **2022**, *23*, 3999-. (IF: **5.924**) Q1 (Organic Chemistry)
48. Yu, X.; Wang, Xi.; Li, D.; **Sheng, R.**; Qian, Y.; Zhu, R.; Wang, Xu.; Lin, K. Mechanically reinforced injectable bioactive nanocomposite hydrogels for in-situ bone regeneration *Int. J. Mol. Sci.* **2022**, *433*, 132799-. (IF: **6.208**) Q1 (Chemical Engineering)
49. Ling, J.K.U.; Sam, J.H.; **Jeevanandam, J.**; Chan, Y.S.; Nandong, J. Thermal Degradation of Antioxidant Compounds: Effects of Parameters, Thermal Degradation Kinetics, and Formulation Strategies *Food Bioprocess Technol.* **2022**, *15*, 1919-1935. (IF: **4.465**) Q1 (Process Chemistry and Technology)
50. Gomes, T.M.; **Perestrelo, R. M. d. S.**; **Câmara, J.S.** µQuEChERS Combined with UHPLC-PDA as a State-of-the-Art Analytical Approach for Quantification of Chlorpropham in Potato *Separations* **2022**, *9*, 77-. (IF: **2.777**) Q1 (Analytical Chemistry)
51. **Freitas, J. D. C.**; **Silva, P.**; **Perestrelo, R. M. d. S.**; Vaz-Pires, P.; **Câmara, J.S.** Improved approach based on MALDI-TOF MS for establishment of the fish mucus protein pattern for geographic discrimination of Sparus aurata *Food Chem.* **2022**, *372*, 131237-. (IF: **7.514**) Q1 (Analytical Chemistry)
52. **Pereira, J. A. M.**; **Berenguer, C.**; **Andrade, C. F. P.**; **Câmara, J.S.** Unveiling the Bioactive Potential of Fresh Fruit and Vegetable Waste in Human Health from a Consumer Perspective *Appl. Sci.* **2022**, *12*, 2747-. (IF: **3.670**) Q2 (Materials Science)
53. Li, X.; Kong, L.; Hu, W.; Zhang, C.; Pich, A.; **Shi, X.**; Wang, X.; Xing, L. Safe and efficient 2D molybdenum disulfide platform for cooperative imaging-guided photothermal-selective chemotherapy: A preclinical study *J. Adv. Res.* **2022**, *37*, 255-266. (IF: **12.822**) Q1 (Multidisciplinary)
54. Li, J.; Chen, L.; Li, C.; Fan, Y.; Zhan, M.; Sun, H.; **Mignani, S. M.**; Majoral, J.-P.; Shen, M.; **Shi, X.** Phosphorus dendron nanomicelles as a platform for combination anti-inflammatory and antioxidative therapy of acute lung injury *Theranostics* **2022**, *12*, 3407-3419. (IF: **11.600**) Q1 (Pharmacology, Toxicology and Pharmaceutics)
55. Ouyang, Z.; Gao, Y.; Yang, R.; Shen, M.; **Shi, X.** Genetic Engineering of Dendritic Cells Using Partially Zwitterionic Dendrimer-Entrapped Gold Nanoparticles Boosts Efficient Tumor Immunotherapy *Biomacromolecules* **2022**, *23*, 1326-1336. (IF: **6.988**) Q1 (Biomaterials)
56. **Houdova, D.**; Popović, .; Dellinger, T.; Nešić, M.; Petković, M. Potential of MALDI TOF mass spectrometry for detection and quantification of corticosterone in the blood of loggerhead sea turtles *Int. J. Mass Spectrom.* **2022**, *473*, 116796-. (IF: **1.986**) Q2 (Condensed Matter Physics)
57. Nešić, M.D.; Dučić, T.; Algarra, M.; Popović, I.; Stepić, M.; **Gonçalves, M. I. J.**; Petković, M. Lipid Status of A2780 Ovarian Cancer Cells after Treatment with Ruthenium Complex Modified with Carbon Dot Nanocarriers: A Multimodal SR-FTIR Spectroscopy and MALDI TOF Mass Spectrometry Study *Cancers* **2022**, *14*, 1182-. (IF: **6.575**) Q1 (Cancer Research)
58. **Pereira, J. A. M.**; Casado, N.; **Porto-Figueira, P.**; **Câmara, J.S.** The Potential of Microextraction Techniques for the Analysis of Bioactive Compounds in Food *Front. Nutr.* **2022**, *9*, 825519-825519. (IF: **6.576**) Q1 (Food Science)
59. Cozzolino, R.; Stocchero, M.; **Perestrelo, R. M. d. S.**; **Câmara, J.S.** Comprehensive Evaluation of the Volatomic Fingerprint of Saffron from Campania towards Its Authenticity and Quality *Foods* **2022**, *11*, 366-. (IF: **4.350**) Q1 (Food Science)

60. Evans, C.A.; Kim, H.R.; Macfarlane, S.C.; Nowicki, P.I.A.; Baltes, C.; Xu, L.; Widengren, J.; Lautenschläger, F.; Corfe, B.M.; **Gad, A. K. B.** Metastasising Fibroblasts Show an HDAC6-Dependent Increase in Migration Speed and Loss of Directionality Linked to Major Changes in the Vimentin Interactome *Int. J. Mol. Sci.* **2022**, *23*, 1961-. (IF: **5.924**) Q1 (Biochemistry & Molecular Biology)

61. Karpus, A.; **Mignani, S. M.**; Zablocka, M.; Majoral, J-P. Crown Macromolecular Derivatives: Stepwise Design of New Types of Polyfunctionalized Phosphorus Dendrimers *Int. J. Mol. Sci.* **2022**, *87*, 3433-3441. (IF: **5.924**) Q1 (Inorganic Chemistry)

62. Zhang, B.; Gao, Y.; Yang, R.; Ouyang, Z.; Yu, H.; Wang, H.; **Shi, X.**; Shen, M. Tumor-Anchoring Drug-Loaded Fibrous Microspheres for MR Imaging-Guided Local Chemotherapy and Metastasis Inhibition *Adv. Fiber Mater.* **2022**, *4*, 807-819. (IF: **12.958**) Q1 (Materials Science)

63. Hassoun, A.; Siddiqui, S.A.; Smaoui, S.; Ucak, İ.; Arshad, R.N.; Garcia-Oliveira, P.; Prieto, M.A.; Aït-Kaddour, A.; **Perestrelo, R. M. d. S.**; **Câmara, J.S.**; Bono, G. Seafood Processing, Preservation, and Analytical Techniques in the Age of Industry 4.0 *Appl. Sci.* **2022**, *12*, 1703-. (IF: **2.679**) Q2 (General Engineering)

64. Li, J.; Yu, X.; **Shi, X.**; Shen, M. Cancer nanomedicine based on polyethylenimine-mediated multifunctional nanosystems *Prog. Mater. Sci.* **2022**, *124*, 100871-. (IF: **48.165**) Q1 (Materials Science)

65. Lesage, V.; **Mignani, S. M.**; Dallemagne, P.; Rochais, C. Advances in prodrug design for Alzheimer's Disease: the state of the art *Expert. Opin. Drug Discov.* **2022**, *17*, 325-341. (IF: **6.098**) Q1 (Drug Discovery)

66. Liu, Y.; **Sheng, R.**; Fan, J.; Guo, R. A Mini-Review on Structure-Activity Relationships of Glycyrrhetinic Acid Derivatives with Diverse Bioactivities *Mini-Rev. Med. Chem.* **2022**, *22*, 1389-. (IF: **3.862**) Q2 (Drug Discovery)

67. Jiang, L.; Ye, H.; Ma, D.; **Rodrigues, J. M. C.**; **Sheng, R.**; Min, D. A smartphone-adaptable fluorescent sensing tag for non-contact and visual monitoring of the freshness of fish *Analyst* **2022**, *147*, 923-931. (IF: **5.227**) Q1 (Chemistry)

68. Taunk, K.; **Porto-Figueira, P.**; **Pereira, J. A. M.**; Taware, R.; Costa, N.; Barbosa, R.; Rapole, S.; **Câmara, J.S.** Urinary Volatomic Expression Pattern: Paving the Way for Identification of Potential Candidate Biosignatures for Lung Cancer *Metabolites* **2022**, *12*, 36-. (IF: **4.932**) Q2 (Biochemistry)

69. **Jeevanandam, J.**; Krishnan, S.; Hii, Y.S.; Pan, S.; Chan, Y. S.; Acquah, C.; Danquah, M.K.; **Rodrigues, J. M. C.** Synthesis approach-dependent antiviral properties of silver nanoparticles and nanocomposites *J. Nanostructure Chem.* **2022**, *12*, 809-831. (IF: **8.000**) Q1 (Multidisciplinary Chemistry)

70. **Jeevanandam, J.**; Kiew, S.F.; Boakye-Ansah, S.; Lau, S.Y.; Barhoum, A.; Danquah, M.K.; **Rodrigues, J. M. C.** Green approaches for the synthesis of metal and metal oxide nanoparticles using microbial and plant extracts *Nanoscale* **2022**, *14*, 2534-2571. (IF: **8.307**) Q1 (Nanoscience and Nanotechnology)

71. Mekuria, S.L.; Ouyang, Z.; Song, C.; **Rodrigues, J. M. C.**; Shen, M.; **Shi, X.** Dendrimer-Based Nanogels for Cancer Nanomedicine Applications *Bioconjugate Chem.* **2022**, *33*, 87-96. (IF: **6.069**) Q1 (Biotechnology)

72. **Gonçalves, M. I. J.**; Kairys, V.; **Rodrigues, J.**; **Tomás, H.** Polyester Dendrimers Based on Bis-MPA for Doxorubicin Delivery *Biomacromolecules* **2022**, *23*, 20-33. (IF: **6.988**) Q1 (Bioengineering)

73. Barhoum, A.; García-Betancourt, M.; **Jeevanandam, J.**; Hussien, E.; Mekkawy, S.; Mostafa, M.; Omran, M.; S. Abdalla, M.; Bechelany, M. Review on Natural, Incidental, Bioinspired, and Engineered Nanomaterials: History, Definitions, Classifications, Synthesis, Properties, Market, Toxicities, Risks, and Regulations *Nanomaterials* **2022**, *12*, 177-. (IF: **5.076**) Q1 (Chemical Engineering)

74. Müllerová, M.; **Maciel, D.**; **Nunes, N. S. H.**; Wrobel, D.; Stofik, M.; Červenková, L.; Krupková, A.; Cuřínová, P.; Nováková, K.; Božík, M.; Malý, M.; Malý, J.; **Rodrigues, J. M. C.**; Strašák, T. Carbosilane Glycodendrimers for Anticancer Drug Delivery: Synthetic Route, Characterization, and Biological Effect of Glycodendrimer–Doxorubicin Complexes *Biomacromolecules* **2022**, *23*, 276-290. (IF: **6.988**) Q1 (Bioengineering)

75. Rischer, H.; Nohynek, L.; Puupponen-Pimiä, R.; **Aguiar, J.**; Rocchetti, G.; Lucini, L.; **Câmara, J.S.**; Cruz, T.; Marques, M.; Granato, D. Plant cell cultures of Nordic berry species: Phenolic and carotenoid profiling and biological assessments *Food Chem.* **2022**, *366*, 130571-. (IF: **7.514**) Q1 (Analytical Chemistry)

Publications 2023 (IF)

- Until May 2023 -

1. Sun, X.; Xing, L.; Yuan, J.; Wang, E.; Ding, Y.; **Sheng, R.**; Wang, F.; Wu, W.; Yang, X. H.; Guo, R. Synthesis and biological evaluation of novel demethylzeylasteral derivatives as potential anticancer agents. *Fitoterapia* **2023**, *167*, 105504-. (IF: **3.204**) Q3 (Chemistry, Medicinal)
2. **Camacho, C. S.**; **Maciel, D.**; **Tomás, H.** ; **Rodrigues, J. M. C.** Biological Effects in Cancer Cells of Mono- and Bidentate Conjugation of Cisplatin on PAMAM Dendrimers: A Comparative Study . *Pharmaceutics* **2023**, *15*, 689-. (IF: **6.525**) Q1 (Pharmacology & pharmacy)
3. Selli, S.; **Perestrelo, R. M. d. S.**; Kelebek, H.; Sevindik, O.; Travaglia, F.; Coïsson, J. D.; **Câmara, J.S.**; Bordiga, M. Impact of Japanese beetles (Popillia japonica Newman) on the chemical composition of two grape varieties (Nebbiolo and Erbaluce) grown in Italy . *Food Res. Int.* **2023**, *165*, 112575-. (IF: **7.425**) Q1 (Food science & technology)
4. **Berenguer, C.**; **Andrade, C. F. P.**; **Pereira, J. A. M.**; **Perestrelo, R. M. d. S.**; **Câmara, J.S.** Current Challenges in the Sustainable Valorisation of Agri-Food Wastes: A Review . *Processes* **2023**, *11*, 20-. (IF: **3.352**) Q1 (Chemical Engineering (miscellaneous))
5. Hassoun, A.; Jagtap, S.; Garcia-Garcia, G.; Trollman, H.; Pateiro, M.; Lorenzo, J. M. ; Trif, M.; Rusu, A. V.; Aadil, R. M.; Šimat, V.; Cropotova, J.; **Câmara, J.S.** Food quality 4.0: From traditional approaches to digitalized automated analysis . *J. Food Eng.* **2023**, *337*, 111216-. (IF: **6.203**) Q1 (Food science)
6. **Porto-Figueira, P.**; **Câmara, J.S.**; Vigario, A. M.; **Pereira, J. A. M.** Understanding the Tolerance of Different Strains of Human Pathogenic Bacteria to Acidic Environments . *Appl. Sci.-Basel* **2023**, *13*, 305-. (IF: **2.838**) Q3 (Chemistry (multidisciplinary))
7. Coutinho, A.; Pinheiro, M.; **Neves, Ana Rute**; Pinto, M. Therapeutic Potential of Genistein: Preclinical Studies, Clinical Evidence, and Nanotechnology Application . *Curr. Med. Chem.* **2023**, *30*, 2480-2517. (IF: **4.740**) Q1 (Pharmacology, Toxicology and Pharmaceutics)
8. Riccio, G.; **Berenguer, C.V.**; **Perestrelo, R.**; Pereira, F.; **Berenguer, P**.; Ornelas, C.P.; Sousa, A.C.; Vital, J.A.; Pinto, M.d.C.; **Pereira, J.A.M.;** Greco, V.; **Câmara, J.S.** Differences in the Volatilomic Urinary Biosignature of Prostate Cancer Patients as a Feasibility Study for the Detection of Potential Biomarkers. *Curr. Oncol.* **2023**, *30*, 4904-4921. https://doi.org/10.3390/curroncol30050370
9. **Jeevanandam, J.;** Tan, K.X.; **Rodrigues, J**.; Danquah, M.K. Target-Specific Delivery and Bioavailability of Pharmaceuticals via Janus and Dendrimer Particles. *Pharmaceutics* **2023**, *15*, 1614. https://doi.org/10.3390/pharmaceutics15061614

EVENTS 2022/23

Events 2022


CQM
CENTRO DE QUÍMICA
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escola secundária
CONFERÊNCIA
"Nanos - o presente e o futuro a outra escala"
Professor João Rodrigues
Investigador sénior do CQM
2022
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Jaime Moniz
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06th April 2022, 15h00
"Thirty years in a big pharmaceutical industry: Lessons learned"
Professor Serge Mignani
Université Paris Descartes
University of Madeira,
Senate Conference Room,
Campus of Penteada
Registration at cqm.uma.pt
[until 05th April 2022]
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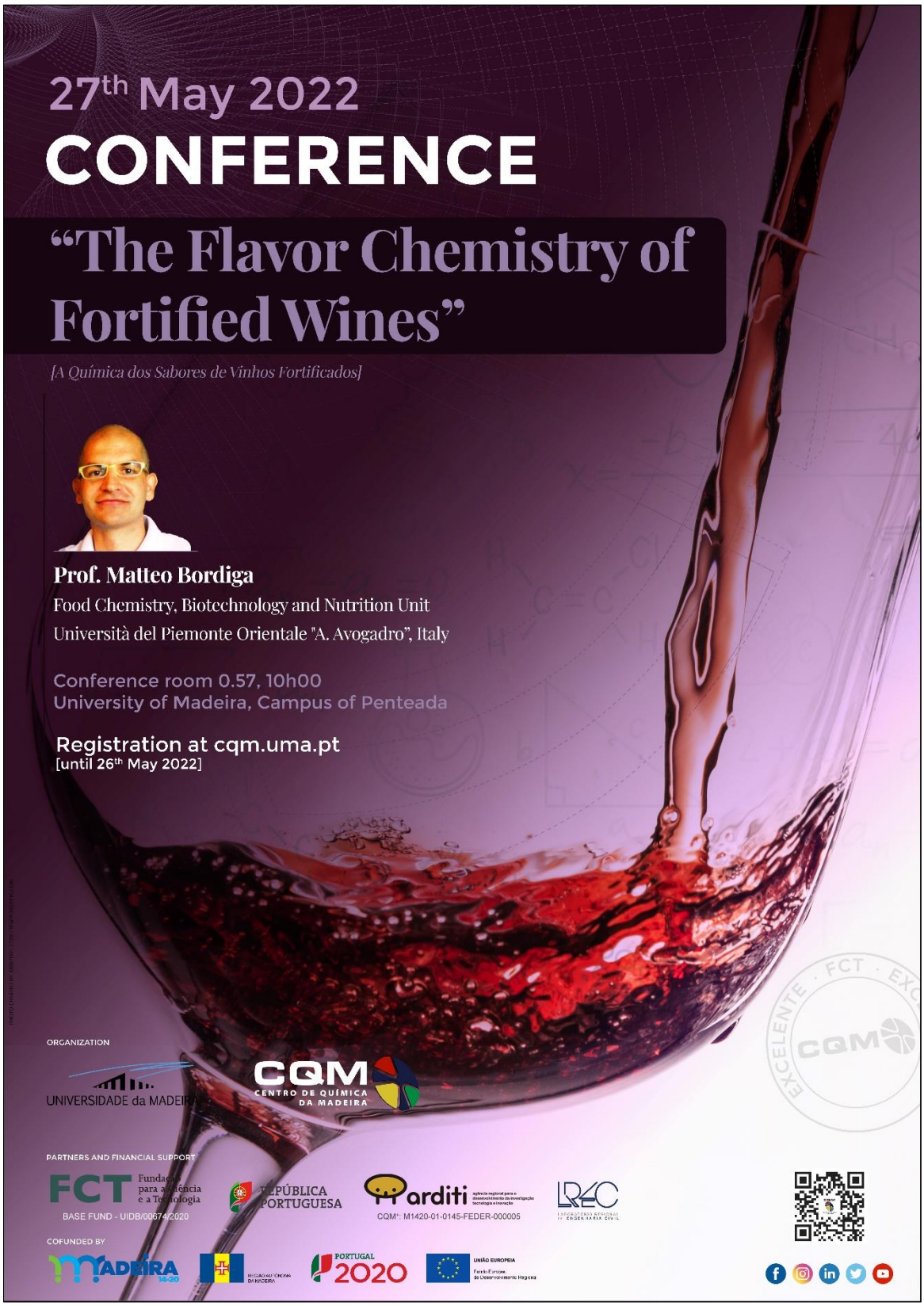
27th May 2022
CONFERENCE
"The Flavor Chemistry of Fortified Wines"
[A Química dos Sabores de Vinhos Fortificados]
Prof. Matteo Bordiga
Food Chemistry, Biotechnology and Nutrition Unit
Università del Piemonte Orientale "A. Avogadro", Italy
Conference room 0.57, 10h00
University of Madeira, Campus of Penteada
Registration at cqm.uma.pt
[until 26th May 2022]
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26.ª edição
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11-15 de julho de 2022


9th CQM ANNUAL MEETING
28-30 September 2022
Auditorium of Colégio dos Jesuítas - UMa
Abstract submission: until 12th September 2022
Registration deadline: 23rd September 2022
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With Professor Serge Mignani, Université Paris Descartes, France
PROGRAM
Seminar 1: 'Drug finding process and druggability concepts'
Seminar 2: 'Selection of current approaches in medicinal chemistry to find innovative drugs'
Seminar 3: 'Nanomedicine in drug discovery and building the future of drug discovery'
05th, 07th and 09th December 2022
11h00 - 13h00
University of Madeira, Campus Penteada, Room 0.57
Registration deadline: 29th November 2022
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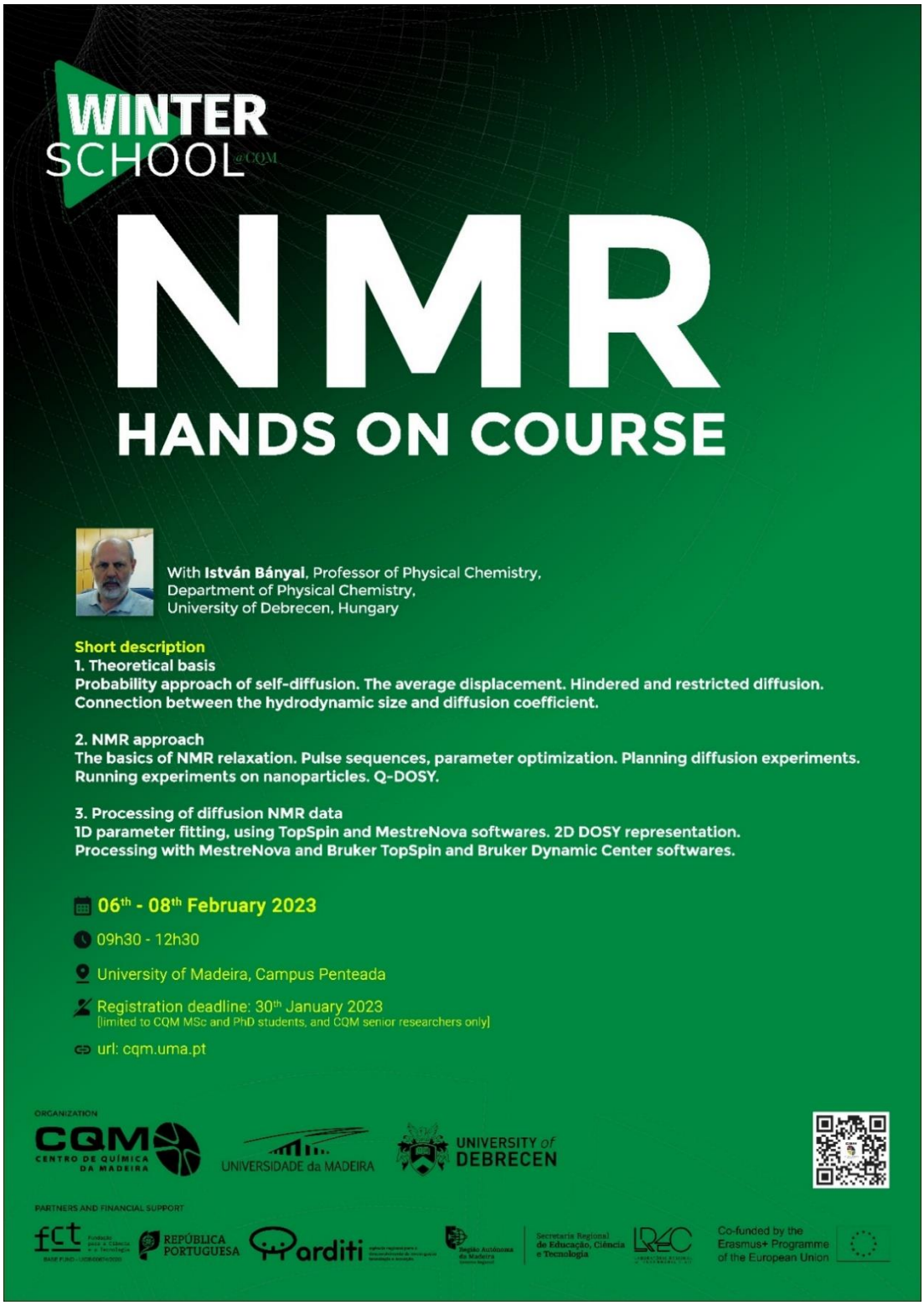


CONFERENCE
"GREEN CHEMISTRY AS A SUITABLE STRATEGY IN FOOD AND ENVIRONMENTAL SAFETY EVALUATION"
Prof. Bárbara Socas Rodríguez
Department of Analytical Chemistry
University of La Laguna
10th February 2023
15h00
University of Madeira, Campus Penteada
Registration deadline: 7th February 2023
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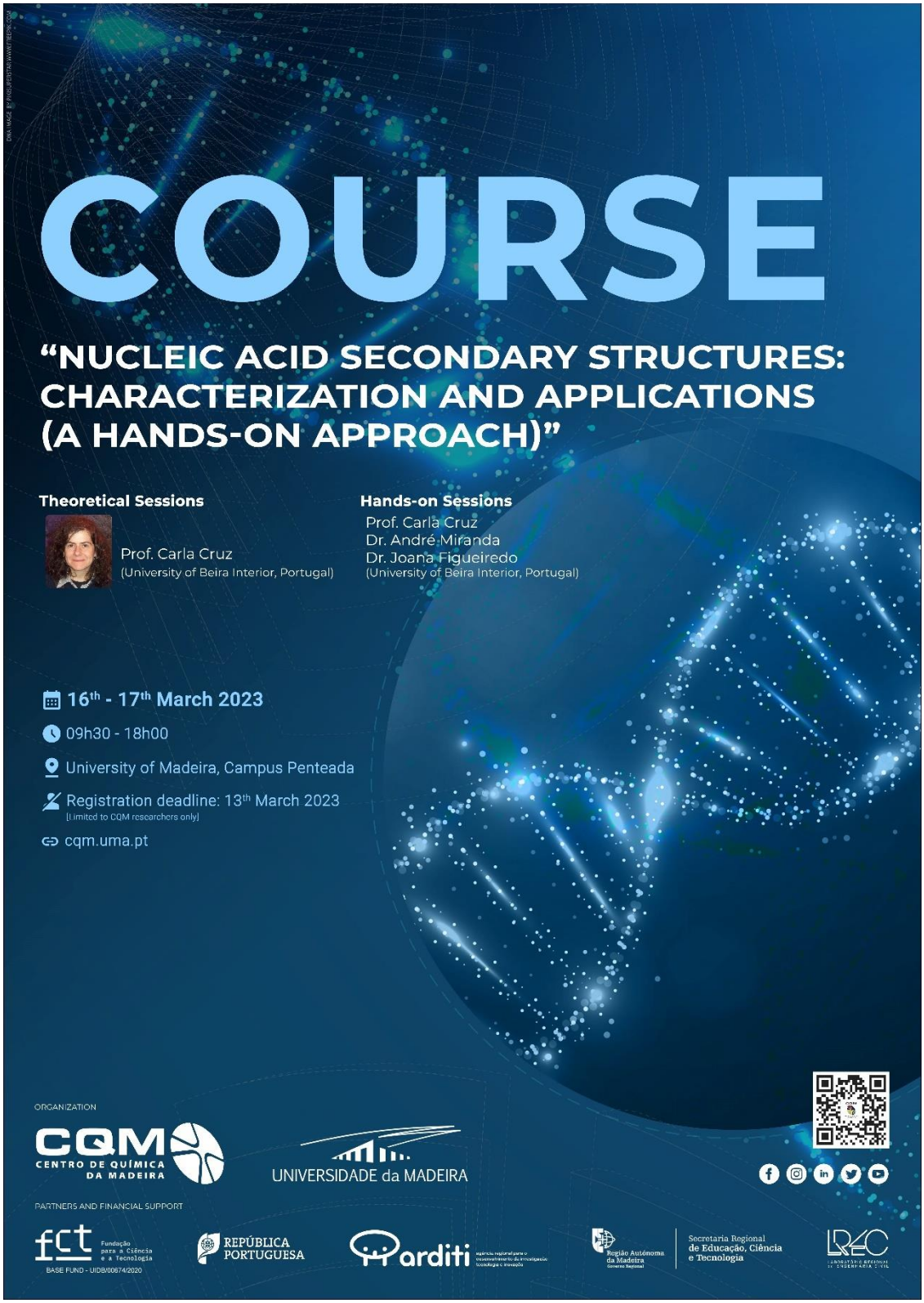
COURSE
"NUCLEIC ACID SECONDARY STRUCTURES: CHARACTERIZATION AND APPLICATIONS (A HANDS-ON APPROACH)"
Theoretical Sessions
Prof. Carla Cruz
(University of Beira Interior, Portugal)
Hands-on Sessions
Prof. Carla Cruz
Dr. André Miranda
Dr. Joana Figueiredo
(University of Beira Interior, Portugal)
16th - 17th March 2023
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"NAPHTHOQUINONES: OCCURRENCE, SYNTHESIS AND BIOLOGICAL IMPORTANCE INCLUDING MEDICINAL USES"
Vitor Francisco Ferreira, PhD
Federal Fluminense University, Faculty of Pharmacy, Brazil
21st April 2023
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Registration deadline: 20th April 2023
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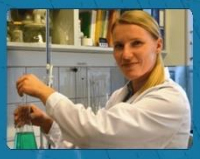

INVITED LECTURER

PhD Eng. Dagmara Malina

Cracow University of Technology

16th - 17th May 2023

14h30 - 17h30

University of Madeira, Campus Penteada

Registration deadline: 12th May 2023

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VITICULTURE AND OENOLOGY IN POLAND
INVITED LECTURER
Prof. Justyna Dobrowolska-Iwanek
Department of Food Chemistry and Nutrition
Jagiellonian University, Kraków (Poland)
19th May 2023
14h30
University of Madeira, Campus Penteada
Registration deadline: 18th May 2023
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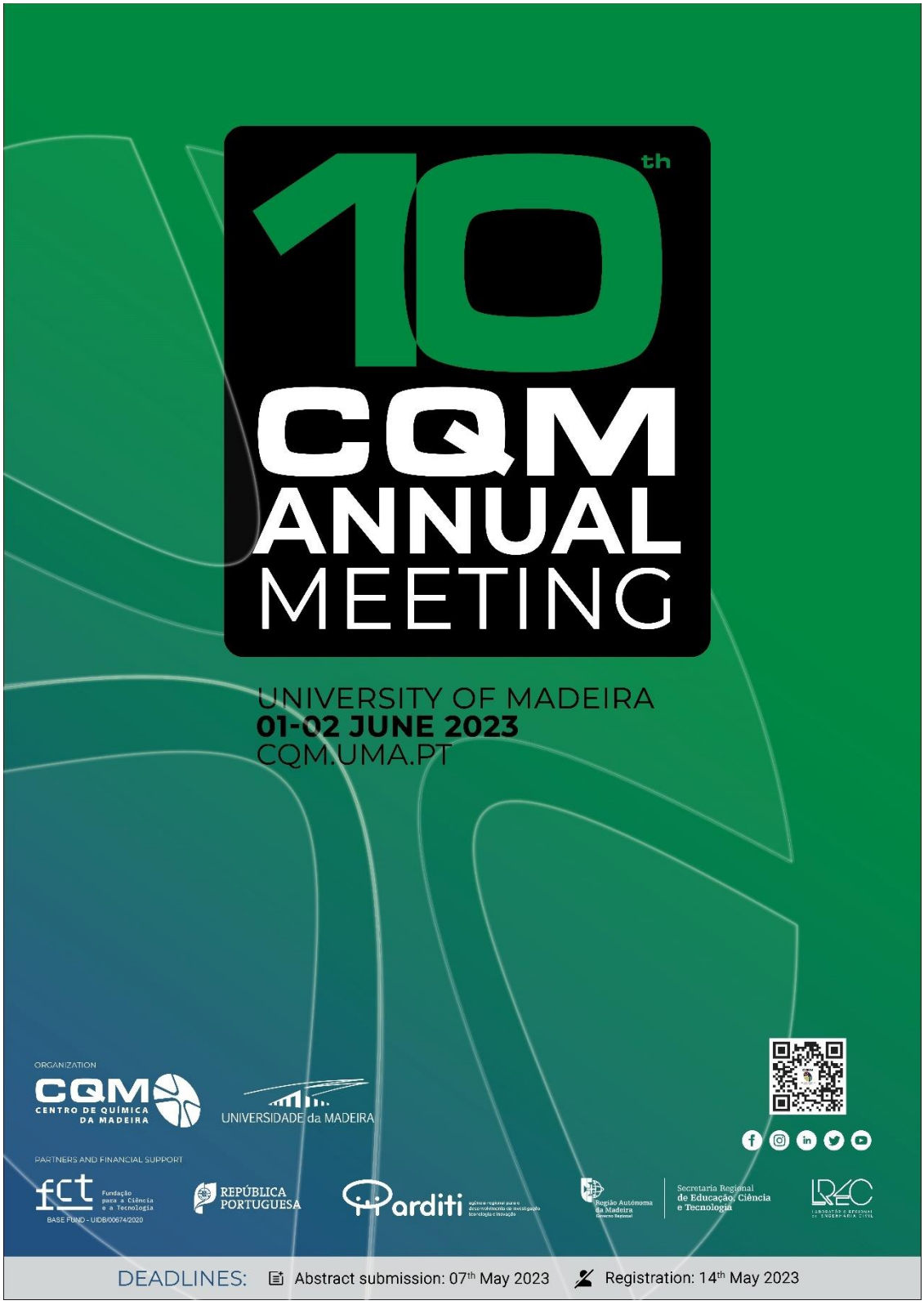
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DEADLINES:
Abstract submission: 07th May 2023
Registration: 14th May 2023


SEMINAR
NANOMEDICINE IN ONCOLOGY DRUG DISCOVERY: MAIN DRUG DEVELOPMENT ASPECTS
INVITED LECTURER
Prof. Dr. Serge Mignani
Centre d'Etudes et de Recherche sur le Médicament de Normandie, France
07th june 2023
15h00
University of Madeira, Campus Penteada
Registration deadline: 01st June 2023
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