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mission 10.000
conference

MISSION 10.000: THE BIOECONOMY

Altice Forum, Braga, PORTUGAL

October 17th, 2018 | Outubro 17, 2018 | 17 de Octubre, 2018

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NANOTECHNOLOGY:
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Welcome to nanoGateway

NanoGateway is a collaborative multi-actor initiative to increase the impact of research in issues of social relevance, involving all the relevant actors to solve complex challenges. The topics of the conference are related to the applications of Key Enabling Technologies (particularly nanotechnology) in the main areas of the Bioeconomy (agriculture, food and water resources).
The **nanoGateway project** is co-funded under the Interreg V-A Spain-Portugal Cooperation Programme (POCTEP) and is lead by the INL involving the POCTEP Regional Development Agencies.

Mission 10.000 Conference

Interdisciplinary research is needed to tackle complex problems and to co-create the best solutions. In this context, nanotechnology has been demonstrating to play an important role in the integration of knowledge across all areas of science and technology.

The Mission 10.000 Conference series aims to create ideas, projects and solutions for common societal challenges by joining academia, industry, the political sector and the society. This event will offer the opportunity to showcase excellent research, to discuss solutions for current needs and to explore future science and emerging technologies that can solve problems in the near future.
The exchange of knowledge and information from a multi-stakeholder perspective will provide a unique understanding of the interactions between academia, industry and society, helping to identify good practices and policies and to promote multilateral cooperation.

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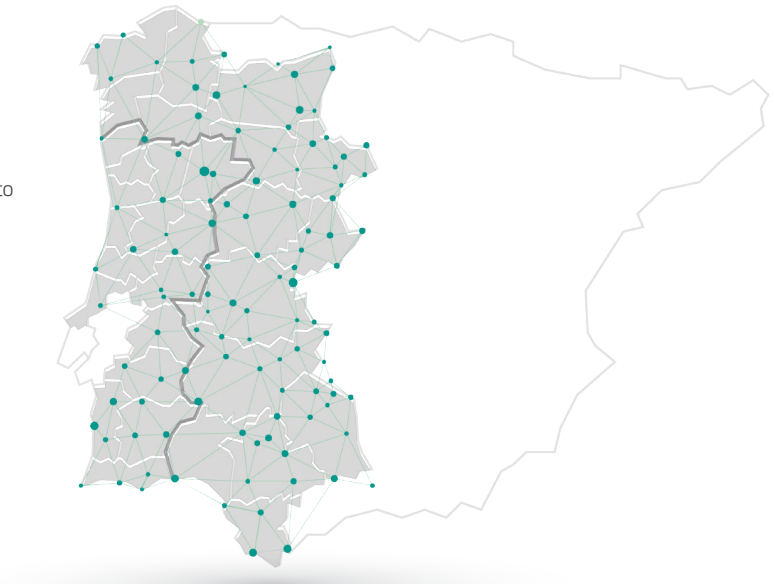

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Welcome to Mission 10.000

The International Iberian Nanotechnology Laboratory (INL) organized in 2018 the First International Conference on Nanotechnology, in collaboration with the Regional Development Offices of Spain and Portugal of the cooperative area POCTEP. The Conference took place on October 17th, 2018 at the Altice Forum Braga in Portugal.

This international conference was part of INL Summit 2018, which aimed to provide new ideas and aspects that foster an innovation ecosystem. The theme of this Summit was "Nanotechnology: a facilitator for the New Economy". Mission 10,000 was a great opportunity to highlight how nanotechnology is already solving the main challenges of the 21st century and to answer the questions: "What can nanotechnology do for me and my business?"

Our objective was to make the Science and Technologies of Key Enabling part of the daily routine of the Iberian companies. For this, we have established an outstanding program, with very high-level international keynote speakers for a full-day event, which united the 8 regions of Portugal and Spain that are part of the nanoGateway program, the Mission 10.000 promoter.
The scientific agenda was developed by the scientific committee, selecting topics such as agriculture and forest, food industry and aquaculture. A total of 59 papers were presented, 46 in poster category and 13 oral category.

Nanotechnology has promised to make solid contributions to today's great challenges that, in turn, will have profound effects on our economy. The explosion of IoT products, massive data and shared economy services are mega trends in today's society and the immense interconnectivity changes modern society at a pace never seen before. Here are direct links to the concepts of Industry 4.0, Factories of the future and Manufacturing with added value. These great social developments challenge society, but the necessary changes also foster disruptive innovations and, consequently, can generate immense economic opportunities. The core of the Mission 10.000 is to articulate the importance of nanotechnology and encourage greater participation, interaction and networking, and foster new dialogues.

Lars Montelius
DG, INL

10 YEARS 2008-2018

INL INTERNATIONAL IBERIAN NANOTECHNOLOGY LABORATORY

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Scientific Committee

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Professor Albano Cavaleiro, University of Coimbra
Professor Celestino Santos, University of Salamanca
Professor Félix Carvalho, University of Porto
Professor José Mª Franco Gómez, University of Huelva
Professor José Rivas, University of Santiago de Compostela
Professor Manuel Collares, University of Évora
Professor Manuel Serradilla, Scientific and Technological Research Center of Extremadura

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Cristina Padilha, Site Management and Conference Office, INL
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Speakers

:: LARS MONTELIUS

Director-General, INL - International Iberian Nanotechnology Laboratory

Since Sept 1st, 2014, Lars Montelius is the Director-General of INL – International Iberian Nanotechnology Laboratory in Braga, Portugal.

He is a full professor in Nanotechnology at Lund University, Sweden and he was Dean of the Physics Department, Science and Engineering Faculties, Lund University, during 2003-2009.

From 2009-2011, he was the director for Öresund University & Öresund Science Region, being a cross-border cooperation between eleven universities, three regional authorities, two countries in the Öresund Region.

Between 2007 and 2014, he was chair of the Swedish Technical Standardization Committee on Nanotechnology, and he is the founder of several Swedish companies working with nanotechnology.

Currently, he is also the President of IUVSTA – The International Union for Vacuum Science, Technique and Applications with more than 150000 members from 32 countries and he is a member of the EC Executive High Level Group (HLG) at DG NMPB, the board member and Working Group Chair of the two European Technology Platforms NANOFutures and EuMat.

:: MANUEL HEITOR

Minister of Science, Technology and Higher Education, Portugal

Manuel Heitor is Minister of Science, Technology and Higher Education in the Government of Portugal since November 2015. From March 2005 to June 2011 he served as Secretary of State for Science, Technology and Higher Education.

Manuel Heitor is a full Professor at Instituto Superior Técnico, IST, the engineering school of the University of Lisbon and was founder and director of the IST´s "Center for Innovation, Technology and Policy Research", as well as director of the IST´s doctoral Programs in "Engineering and Public Policy, EPP" and in "Engineering Design". In 2011-12 he was a Visiting Scholar at Harvard.

He earned a PhD at Imperial College, London, in 1985 in combustion research and did post-doctoral training at the University of California San Diego. Then he pursued an academic career at IST, in Lisbon, where he served as Deputy-President for the period 1993-1998.

Since 1995, he has been Research Fellow of the IC2 Institute of the University of Texas at Austin. He is a founding member of the S&T Council of the "International Risk Governance Council", IRGC. He was a co-founder of the European network "science, technology, education and policy for Europe, step4EU".

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:: ANA TERESA LEHMANN

State Secretary of Industry, Government of Portugal

Ana Lehmann is the Secretary of State for Industry of the Portuguese Government. Before taking office in July 2017, she developed a strongly focused international career of two decades spanning academia, public policy and executive positions in over twenty public and private organizations.

Her areas of specialization relate to the competitiveness of firms and industries, notably companies' internationalization, foreign direct investment attraction, innovation, industrial clusters and public policy.

She has been a consultant to leading international institutions (OECD, UNCTAD, European Commission, among others) and various national and regional governments in five continents.
She held a variety of managerial responsibilities in several companies and foundations, as well as having founded several companies. She has been CEO of InvestPorto, Vice-President of the Regional Government Authority of Portugal's Northern Region, President of the Managing Authority of the Atlantic Area Transnational Program of the European Union, Pro-Rector for Strategic Planning/Enterprise Relations (U.Porto) and has been involved in setting up the Portuguese Investment Agency.

She is a Professor of Economics (FEP-University of Porto, Portugal) and has been Head of International Business (Porto Business School). Visiting Professor or Visiting Fellow in several US/European universities (e.g. Universities of Strathclyde, Reading, Glasgow, Columbia, among others), and President and one of the 20 Fellows of the European International Business Academy. She has an MSc and a PhD in Economics (University of Reading, UK) and a BSc in Management (U.Porto). A regular speaker in top-level conferences, she has been an Editor of scientific journals and is an author widely published in her field. She is the author/editor of books such as Rethinking Investment Incentives: Trends and Policy Options (2016), Entrepreneurship in the Global Firm (2011) and Multinationals, Clusters and Innovation: Does Public Policy Matter? (2006).

Scientific Speakers

:: ORLANDO J. ROJAS

Professor & Chair of the Materials Platform, Aalto University. Department of Bioproducts and Biosystems, School of Chemical Engineering and Centre of Excellence in "Molecular Engi-neering of Bio-synthetic Hybrid Materials" (HYBER)

Professor Orlando Rojas is chair of the Materials Platform of Aalto University where he holds double affiliation with the departments of Bioproducts and Biosystems and Applied Physics.

He is the recipient of the 2018 Anselme Payen Award, one of the highest recognitions in the area of cellulose and renewable materials. He is elected Fellow of the American Chemical Society, the Finnish Academy of Science and Letters and is the recipient of the 2015 Tappi Nanotechnology Award. He is co-PI of the Academy of Finland's Center of Excellence in Molecular Engineering of Biosynthetic Hybrid Materials Research, HYBER (2014-2019). His most recent research grants include the prestigious European Research Commission Advanced Grant (ERC-Advanced) and the Academy of Finland Materials Bioeconomy Flagship.

He has published over 300 peer-reviewed papers related to the core research of his group, "Bio-based Colloids and Materials", which mainly deals with nanostructures from renewable materials and their utilization in multiphase systems.

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:: TEKLA TAMMELIN

Principal Scientist in Fibres and Biobased Materials Research area and Docent in Bioproduct Technology, Aalto University

Dr. Tekla Tammelin graduated from Helsinki University of Technology (now Aalto University) in 2006. She is acting in a senior expert network in VTT SONE (Solutions for Natural Resources and Environment) Business Area with an internal role as Principal Investigator with the strategic research responsibility area of "Nanocellulosic materials".

Expertise areas include the development of novel biobased materials, especially nanocellulosic materials and hemicelluloses as well as the formation of structures (films, foams and webs) and the applications thereof by understanding the structure-function interdependencies and decisive role of interfaces.

She is presently promoting and creating novel, innovative biomaterial concepts towards future breakthrough solutions. These concepts include biobased structures as selective membranes, intelligent packaging materials and as electronic devices and energy materials.

:: ASHOK PATEL

Associate Pofessor at Guangdong Technion Israel Institute of Technology in Shantou, China

Dr. Ashok Patel, author of book 'Alternative Routes to Oil Structuring (Springer, 2015)' and editor of book 'Edible Oil Structuring: Concepts, Methods and Applications (RSC, 2017)', is currently working as an associate professor at Guangdong Technion Israel Institute of Technology in Shantou, China.

He prides himself in being an internationally mobile researcher who has been active in the field of food colloids within different sectors including industry (Unilever R&D Vlaardingen, Netherlands), University (Ghent University, Belgium) and research organization (International Iberian Nanotechnology Laboratory, Portugal).

His past and current research are focused on using food-grade ingredients to create novel structured systems (including oleogels, foams, colloidal particles and complex emulsions) to solve formulation issues in food product development. He has published more than 80 publications (> 50 as the first author) in the area of food colloids. For his research, he has received prestigious and highly competitive individual funding from European Commission on three different occasions (Marie Curie International Incoming Fellowship, Marie Curie Career Integration Grant, Marie Curie Cofund Fellowship) and other Young Scientist Awards and nominations.
In 2015, he was selected for a once-in-a-lifetime opportunity to participate at the Lindau Nobel Laureate meeting as a visiting scientist.

:: MARINELLA FARRÉ

Research scientist, permanent staff at IDÆA-CSIC

Dr. Marinella Farré has a PhD in Chemistry from University of Barcelona (Dec.2003), and Research scientist, permanent staff at IDÆA-CSIC from July 2008. She has more than 150 scientific papers in journals of SCI (H-index of 47), 22 book chapters and she has co-Editor of a book.

She has supervised 3 PhD Thesis and currently is the supervisor of 4 on-going more. She is involved in the study of the occurrence and impact of organic micropollutants in the environment as well as the development and applications of new biological tools such as biosensors. She was involved in more than 30 Research projects with national and EU funds, and she was the coordinator of the Sea-on-a-Chip project.

Cross-Cutting Speakers

:: PAULA GALVÃO

Business and Strategic Relations Chief Officer, INL

Paula Galvão has been working at INL since June 2011 and is the Chief Officer of the Business & Strategic Relations department. She has a consolidated experience in performing activities related to RTD funding programmes, studies on innovation policies, development of innovation strategies, and providing innovation related consulting services for companies and regional institutions.

Over the years, she has gained key experience in establishing business relations and developing interactions with European institutions and other public and private client organizations. At INL she is responsible for activities dealing with coordination of International Projects, technology exploitation, business development, collaborations establishments, INL´s incubator and start-up support program, and to provide advice to researchers on innovation funding schemes.

She started her work at a technology transfer office of a university. Over her career, she has held several senior and management positions in consulting companies. Paula Galvão holds a University Degree in Materials Engineering from the University of Minho (Portugal).

:: LUÍS MIRA

Associate Professor at Instituto Superior de Agronomia / University of Lisbon

Luís Mira da Silva is Associate Professor at the Instituto Superior de Agronomia / University of Lisbon. He has a degree in Agronomic Engineering by the Instituto Superior de Agronomia, a PhD in Agricultural Systems by the University of Reading (UK), and an Executive MBA from London Business School / University of London (UK).

He is President of Inovisa (www.inovisa. pt), member of the Board of Agrinatura (http://agrinatura-eu.eu/), and National Representative in the strategic subgroup Agricultural Knowledge and Innovation Systems (AKIS) of the Standing Committee on Agricultural Research (SCAR) of the European Commission. He is also the coordinator of several national and international projects (in Europe and Africa) in the areas of innovation, technology transfer and entrepreneurship in the agri-food sector.

:: JUDIT ANDA

Technical Adviser at Agriculture, Fisheries and Rural Development Ministry of Regional Government of Andalucía, Spain

Judit Anda is Agricultural Engineer by the University of Cordoba, Master Degree in Rural Development & Agrifood Business Administration, Master Degree in Environmental Impact Assessment.

From 2006 to 2013 she held high office positions within Regional Government of Andalucía, Spain, where she has developed public policies related with agro-food, animal health, plant health, regulation of the crop-livestock industry, and development of Community´s agricultural policies.

She is currently Technical Adviser at Agriculture, Fisheries and Rural Development Ministry of Regional Government of Andalucía, Spain, where she is responsible for the Bioeconomy Strategy Coordination of Andalucía. She is also responsible for content and strategy for the Rural Development Program of Andalucía (FEADER) and the promotion of digitalization in the agro-food industry, including coordination of European partnership S3 Agrifood: Traceability & Big Data in Agrifood value chain, and the creation of DIH Andalucia-Agrotech.

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:: FABIO BOSCARELI

Coordinator S3 AGRI-FOOD HI TECH FARMING, Italy

Fabio Boscaleri is policy advisor at the Tuscany Region Brussels liaison office. His main areas of competence are Environmental, Energy and Agricultural policies.

He is the Brussels coordinator of the informal Network of European Regions for Innovation in Agriculture, Food and Forestry (ERIAFF). With a strong interest in networking and innovation projects, he promoted the creation of a thematic partnership on High Tech Farming under the S3 AGRIFOOD Platform. He is member of the European Stakeholders Bioeconomy Panel for the period 2016-2019 and partner in two active H2020 CSA Projects: NEFERTITI (European Network of Demo Farms) and ROSEWOOD(Network of European Regions for Wood Mobilization).

In his previous position at the Ministry for Agriculture of Tuscany Region, he was in charge of green biotechnologies and member of the Italian Inter-ministerial Commission for the assessment of transgenic organisms.

:: HEINER LINKE

Professor of Nanophysics, Lund University, Sweden

Heiner Linke is a Professor of Nanophysics at Lund University in Sweden. Between 1998 – 2001 he was a research fellow in Sydney/Australia, before joining the physics department at the University of Oregon in 2001 where he received indefinite tenure in 2005 and remained until 2009.

Since 2013, he is the Director of the Center for Nanoscience at Lund University (NanoLund), an interdisciplinary research environment engaging about 300 scientists in three faculties.

His research interests focus on energy conversion at the nanoscale, including molecular motors and thermoelectrics. He was elected a member of the Royal Swedish Academy of Sciences (physics class) in 2014.

:: PAULO VILAÇA

Chief Operations Officer at SilicoLife

Paulo Vilaça, COO on SilicoLife, MSc Bioinformatics, concluding PhD in Computer Science, 8+ years of experience in technical management roles. He has a strong background in software development and engineering.

Paulo is responsible for the daily management of a development team with more than 15 people working in systems biology and artificial intelligence applied to industrial biotechnology problems.

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:: ANTÓNIO BOB SANTOS

Administrator of ANI (National Innovation Agency) of Portugal

Dr. António Bob Santos is a specialist in Innovation Policy and Open Innovation and member of ANI's Board of Directors, since July 2018, having served as Advisor for Innovation Policies at the same institution (2017/2018).
Since 2001 has collaborated with several governmental structures in the field of Innovation Policy, being part of the design, management and monitoring teams of PROINOV (Integrated Program for Innovation Support), the Technological Plan, the Digital Agenda, the Lisbon Strategy, the National Reform Plan and the National Program for Entrepreneurship and Innovation (+ E + I).

Dr. António Bob Santos was an innovation project manager at UMIC (Portuguese Knowledge Society Agency), with responsibilities for designing initiatives such as NEOTEC, OTIC, b-on Centers of Excellence (Online Knowledge Library), and collaborating in the management of Smart Cities projects at CEiiA.

He holds a PhD in Economics from ISCTE-IUL (Instituto Universitário de Lisboa). In this institution, he completed his Master's Degree in Labour Sciences (2002) and the Economics Degree (1998). António Bob Santos was also a Masters guest lecturer at the Polytechnic Institute of Santarém (2008-2012) and ISCTE-IUL (2017/2018).

:: VICTORIA LEY

Head of the Division of Coordination, Evaluation and Follow up at the Spanish Research Agency

PhD in Biochemistry and Molecular Biology from the Autonomous University of Madrid, she did her doctoral thesis at the Center of Molecular Biology Severo Ochoa and postdoctoral stays at the New York University Medical Center (New York, USA, 1986-1989) and the Institute Pasteur (Paris, France, 1989-1991).

She worked as a researcher in the field of virology 2003 when she joined the National Evaluation and Prospective Agency (ANEP) and stayed as director until 2012. In 2013, she started a new line of work in the field of physical activity and its association with chronic diseases. She is in charge of the scientific evaluation, selection and follow-up of all programs and calls funded by the Agency, as well as numerous calls funded by regional, universities and private institutions.

:: JESUS ESCUDERO

International Relations INIA (National Institute for Agricultural and Food Research and Technology). Spanish NCP for H2020 – Societal Challenge 2 Bioeconomy

Dr. Escudero has a BSc in Biology by Complutense University (Madrid, Spain) and he holds a PhD in Molecular Biology of Plants by Basil University (Basil, Switzerland). He developed a carrier in applied science to agriculture in several Research Centers, both national- and international-based.

He also worked in the biotechnology industry (Mogen International – Zeneca Agrochemicals, Syngenta Ltd.). He took part in scientific projects supported by top tier scientific organizations as the European Molecular Biology Organization, and Human Frontier Science Program Organization.

Afterwards, he had responsibilities of assessment and technical management of R&D&I projects. Currently, he is responsible for International Relations of INIA (National Institute for Agricultural and Food Research and Technology), Spain, being also Spanish NCP for H2020 – Societal Challenge 2 Bioeconomy.

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:: JOÃO NUNES

President and CEO of Associação BLC3 – Campus de Tecnologia e Inovação, Portugal

João Nunes is Founder and President of the Association BLC3 of the Campus of Technology and Innovation. He is also Founder and President of the All – Portuguese Association for Bioeconomy and Circular Economy.

The CEO is Member of the Working Group and Monitoring of the Societal Challenge 2: Food Security, Sustainable Agriculture and Forestry, Marine, Maritime and Inland Water Research and the Bioeconomy. He takes part in the working group on the definition of intelligent specialization strategies for the Central Region (Portugal) as Member of RIS3.

Since 2015, he has been Scientific Advisor in Business context of 6 Doctoral Thesis in Industrial Biotechnology. He advised 6 Master Thesis in Biorefinery, Mycology, Life Cycle Assessment and Energy and Agrofood Systems. From 2007 to 2010, he took responsibilities of co-orientation of research projects of the Integrated Master's Degree in Environmental Engineering and Mechanical Engineering of the Sciences and Technologies Faculty of the University of Coimbra (FCTUC): 2nd Generation Biofuels; Waste Management and Management; Life Cycle Assessment; Industrial Ecology; and Integrated Technology Optimization.

He has published more than 20 technical-scientific articles and more than 50 oral presentations and posters in the areas of Bio-refineries, Energy, Industrial Biotechnology, Biofuels, Bioeconomics, Circular Economy, Life Cycle Assessment, Biofuels, Biomass, Environment, Rational Energy Use, Forest Fires.

He received three awards for recognition of technical-scientific work and 1 of regional work merit. He is also responsible for 1 National Patent; in evaluation, 1 National Patent and 1 European and one international; 5 brands. João Nunes holds a PhD in Biosciences (ecology and value chains of Biorefinery) and master's degree and bachelor before Bologna Declaration in Mechanical Engineering: Energy and Environment.

:: SONIA PAZOS

Business and Strategic Relations Officer, INL

Sonia joined INL in June 2017 as Business and Strategic Relations Officer focusing on public-private Business Development and Strategic Partnerships. She holds an MSc degree in Business Management, Investment and Finance and a complementary background in Innovation Management, Talent Management and Project Management (PMO´s, Agile methodologies).

She has a thorough knowledge of Innovation and Technology Transfer policies, methodologies and instruments, as she combines substantial experience in management positions at public and private entities: Director of Technology Centres at GAIN Innovation Agency (Regional Government), Innovation Manager at FEUGA Enterprise-University Foundation, Public-Private Interim Manager and Consultant for almost 20 years.

She was in charge of the design and implementation of Innovation and Technology Transfer strategies, policies, programmes, instruments, multi-actor projects and public-private partnerships, mainly focused on Industry-driven R&D, design-driven/ user-driven innovation, innovation delivery and technology deployment.

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:: MARTA CANDEIAS

Portuguese NCP of FP R&D H2020 for Nanotechnology, Advanced Materials and Manufacturing

National Contact Point for the Key Enabling Technologies "Nanotechnologies, Advanced Materials and Advanced Processes and Manufacturing" and for the SME Innovation Program with particular emphasis on SME Instrument and Fast Track to Innovation.

Marta Candeias holds a Bachelor's degree in Biological Engineering from the Technical University of Lisbon (Instituto Superior Técnico). With a master's degree in the same area, specialization in disciplines in the field of biomaterials, and acts as National Contact Point (NCP) for the Research and Development Framework Programs Technological Development of the European Union since 2009 (FP7 and Horizon 2020) on the topics of nanosciences, nanotechnologies, advanced materials, processes and advanced manufacturing and SMEs.

Between 2007 and 2009 she did research at Instituto Superior Técnico and participated in some national and European projects. Since 2009, she has participated in projects for the integration and capacity building of NCP efforts in the themes that it has followed up in FP7 (SMEsGoHealth, TrasnCoSME, NMP TeAm and NMP TeAm 2).

:: TERESA BERNAL

Head of the Department of Services and Innovation Observatory Galician Innovation Agency, Xunta de Galicia

Teresa Bernal Cortegoso has a degree in Law from the University of Coruña.

A civil servant in the general administration of the Xunta de Galicia since 1999, initially exercising functions in the field of active employment policies and labour market analysis and, since 2015, responsible for the department of advice, support and fundraising for innovative companies and entrepreneurs in the Galician Innovation Agency.

She also collaborates as teaching staff in postgraduate courses and master's programs in the field of employment and innovation.

:: INÊS SANTOS SILVA

Adviser at the Cabinet of the Portuguese Secretary of State of Industry, Portugal

Inês Santos Silva is an Adviser at the Cabinet of the Portuguese Secretary of State of Industry.

Since 2010, Inês has been one of the most active members of the Portuguese startup scene, launching several initiatives to support entrepreneurs, startups and investors.

Among the projects she cofounded are Startup Pirates, a one-week pre-acceleration program for aspiring entrepreneurs and PortugalStartups.com, a news portal about the Portuguese startup scene.

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:: JESÚS ALONSO

General Secretary at Science, Technology and Innovation Ministry of Regional Government of Extremadura, Spain

Dr. Jesús Alonso holds a PhD in Biological Science from the Complutense University of Madrid. He has been a CSIC scientist since 2006, developing his activity at the Food and Nutrition Science and Technology Institute, with extensive experience in the management of R & D projects, as well as in the field of technological innovation in the food chain.

He has been general director of Innovation and Business Competitiveness and later as a general director of Science and Technology, participating in the elaboration of the Regional Law of Science, Technology and Innovation, the creation of the Center of Scientific and Technological Investigations of Extremadura (CICYTEX) and the Scientific and Technological Park of Extremadura, as well as the management of the Regional R & D & I Plans and the Regional Innovation Program.

:: BEATRIZ ASENSIO

Head of the European Programmes Unit at the Institute for Business Competitiveness of Castilla y León, Spain

Beatriz Asensio is graduate in Chemical Engineering from the University of Valladolid and master in Environmental Engineering and Technology from the Polytechnic University of Cataluña.

After several positions related to energy plants research, design and management in private entities, since 2006 she has been working as R&D projects manager, promoting the participation of regional entities in European and international R&D programmes and giving direct support to companies from very different sectorial ambits.

:: PEDRO CARNEIRO

Business and Strategic Relations, INL

Pedro Carneiro has been working at INL since April 2016 as Business & Strategic Relations Officer, using his industry and scientific areas knowledge and network to promote and establish new national and international projects for INL.

He has solid experience in General Management, with leading roles in Science and Technology public management, Administrative, Marketing, and Sales, and General Management functions, in local and multinational companies (Unilever-Jerónimo Martins, ONI Telecom and Grupo Bertrand-Circulo Leitores (BertelsmannPublishing), and in the public sector (VP of FCT the Portuguese science and technology funding agency). This has offered him extensive experience of interaction and negotiation with both international scientific IGO's and EU working groups.

He currently also collaborates with Universidade Católica Portuguesa, where he is the Medical Sciences Project coordinator and lectures Statistics (Undergraduate) and Strategic Management Consulting Projects (MSc) in the business school as visiting professor. Pedro holds an Economics degree from Catolica Lisbon and MBA degree from Nova Business School.

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:: JOANA BRANCO

Innovation Director of Biocant Park, Portugal

PhD in Biomedical Sciences (Baylor College of Medicine - Houston, USA; ICBAS-University of Porto), and specialized in Entrepreneurship from Porto Business School, Joana is a co-founder of Gene PreDiT, a biotechnology company dedicated to the development of a new therapy for obesity.

She joined the Biocant Park team in 2015, where her skills in entrepreneurship, start-ups, technology monitoring and transfer, business development in science-based projects, and fundraising become an asset.

Based on her experience, she is often a speaker and mentor in programs to support the development of ideas and the promotion of entrepreneurship. She is currently an Innovation Director at Biocant Park, where she is dedicated to promoting innovation in biotechnology and internationalization of the sector.

:: SOUMODIP SARKAR

Executive President of "PACT – Science and Technology Park of Alentejo"
Vice-Rector for Innovation, Cooper-ation & Entrepreneurship, University of Évora
Fellow at the Asia Center, Harvard University. Full Professor and Vice-Rector for Innovation, Cooperation & Entrepreneurship at University of Évora. Portugal

Soumodip Sarkar is a Full Professor at the Department of Management, University of Évora, Portugal, and researcher at CEFAGE-UE. He is currently also an Associate (Non-resident Fellow) of the Asia Center at Harvard University and the Vice-Rector of the University of Évora, as well as the Executive President of the Science Park of the region (PACT).

He is the President of the External Evaluation team of the Portuguese University Evaluation Commission (A3ES), in the area of Management in Portugal. Internationally he is part of the CEEMAN accreditation team.

His current research interests include innovation, entrepreneurship and sustainability. His recent research has been published in high impact journals such as Scientometrics, Journal of Business Venturing, Journal of Small Business Management, European Management Journal, Entrepreneurship & Regional Development, Technology Forecasting and Social Change, Journal of Business Research, Service Business, Sustainability, Journal of Cleaner Production, Journal of Knowledge Economy, European Journal of Innovation Management, Service Industries Journal, Trends in Food Science and Technology, Regional Science and Urban Economics, Energy Journal among others.

He has published four books on entrepreneurship and innovation, and his most recent book, EntreSutra to be published by Bloomsbury in May 2018. He has been a coordinator as well as a team member of sixteen international (EU funded) as well as regional projects, and currently involved in nine different projects. Prof Sarkar has given a large number of international keynote speeches and is a highly a sought after speaker on the relevance of entrepreneurship and innovation in society. He has been featured in national and international media, including The Economist and BBC. In 2008, he was recognized as one of the top 100 experts on innovation (WEF-McKinsey).

NANOTECHNOLOGY:
An enabler for the BIOECONOMY

nanoGateway International Conference | 17th of October, 2018 | Altice FORUM, Braga (Portugal)

BRAGA, a lovely city

Braga is a lovely city, one of the oldest in the country, and is teeming with young people who study at its University.

Built more than 2,000 years ago, "Bracara Augusta" was founded by Roman Emperor Augustus. It was located on one of the main Roman roads in the Iberian Peninsula, being the administrative seat of the Empire, and later given the status of capital of the Roman province of Gallaecia, present-day Galicia, by Emperor Caracalla. The Braga Diocese is the oldest in Portugal and, in the Middle Ages, the city even competed with Santiago de Compostela in power and importance. One of the "Caminos de Santiago" passed through here when this pilgrimage cult grew after the Christian reconquest and the foundation of Portugal.

Braga's Cathedral is also the oldest in the country and was built in the 12th century by the parents of Portugal's first King, D. Henrique, and D. Teresa, who are buried there. Braga is to this day one of the country's main religious centres, having the Holy Week celebrations and the São João festival as the highlights in its liturgical and tourist calendar.

Besides the Tesouro-Museu da Sé (Cathedral Treasure Museum), it is worth visiting the Biscainhos Museum, housed in a Baroque palace, a landmark period in the history of Braga, and the D. Diogo de Sousa Archaeological Museum, since the city also abounds in remains from the Roman era. We suggest a leisurely stroll around the historic centre to visit some of its many churches, admire the houses and historical buildings, such as **Palácio do Raio, Theatro Circo, or Arco da Porta Nova,** and to have a coffee at the emblematic Brasileira with a view of the busy Avenida Central. But Braga is also considered the youngest city in Portugal and, from its contemporary landmarks, the Braga Municipal Stadium stands out, designed by Souto Moura, one of the most prestigious Portuguese architects and a winner of the Pritzker Prize.

The **Theatro Circo** was promoted in 1906 by a group of people from Braga, led by Artur José Soares, José António Veloso, and Cândido Martins. To that date, the city only had the small Teatro São Geraldo. In 1911, the project began to take shape by the hand of the architect João de Moura Coutinho and on April 21, 1915, Theatro Circo was opened, coinciding with a period of great economic and social development in Braga.
Over the decades, the space undergone profound works of rehabilitation, aimed at the conversion of Theatro Circo into a large cultural complex, equipped with the most updated and complete scenic and sound technology, able to meet the needs of contemporary art in its many dimensions.

Praça da República
More info: https://visitbraga.travel/braga

Catedral da Sé de Braga
More info: braga.360portugal.com

Theatro Circo
More info: www.theatrocirco.com/en

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Bom Jesus de Braga
More info: www.youtube.com (Aerial view in 4k)
https://bragacool.com/visitar/bom-jesus-monte
https://www.travelingwithaga.com/how-to-visit-bom-jesus

Here you can download a tour guide and more information about Braga:
https://visitbraga.travel/pub/media/guia/roteiro_braga.pdf

Every visitor to Braga must see the **Bom Jesus Sanctuary,** a city icon, with its monumental staircase, declared World Heritage by UNESCO in 2019. Amid an expanse of greenery, it offers an excellent panoramic view of the city, as do two other churches nearby: Nossa Senhora do Sameiro Sanctuary, an important place of Marian worship, and Santa Maria da Falperra Church.
Bom Jesus is considered one of the most beautiful sanctuaries in Portugal and it's a reference of Baroque art in Portugal, with its history dating back to the 14th century.
To get there, you can climb the famous staircase to the neoclassical church, with 581 steps, surrounded by magnificent gardens and hotels. Alternatively, you can use the elevator that takes you to the top of the staircase. This elevator, operating since 1882, is unique in the Iberian Peninsula and the oldest in the world still active. The lift is moved by water, by counterweight, with two cabins, which are connected by a cable. The way this elevator works makes it one of the most extraordinary engineering pieces in Portugal.

Moreover, it's also possible to take the car to the top and have a picnic in the magnificent gardens of Bom Jesus and thus enjoy the fresh air of nature and breathtaking scenery. The sunset seen from here gives a whole new sense to the concept of "golden hour".

Over the last few years, the University of Minho and the quality of contemporary architecture have instilled an atmosphere of youthful vibrancy which has brought this ancient city to a level of unexpected modernity.
All these attributes were paramount for Braga to be considered the **Second Best Destination in Europe in 2019** in the contest promoted by **"European Best Destinations".**

Jardim de Santa Barbara
More info: braga.360portugal.com

Interreg España - Portugal
Fondo Europeo de Desarrollo Regional
Fundo Europeu de Desenvolvimento Regional
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MISSION 10.000: THE BIOECONOMY

Altice Forum, Braga, PORTUGAL

17 de Outubro, 2018

Versão em Português

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NANOTECNOLOGIA: Facilitadora da BIOECONOMIA

Bem-vindo ao nanoGateway

Nanogateway é um projeto que visa a implementação de uma estratégia multirregional e plano de ação para explorar o potencial da nanotecnologia no fomento do crescimento inteligente, riqueza e qualidade de vida

O projeto **nanoGateway** é cofinanciado pelo Programa de Cooperação Interreg V-A Espanha – Portugal (POCTEP) e liderado pelo INL, envolvendo as Agências de Desenvolvimento Regional da área abrangida.

Mission 10.000 Conference

A investigação interdisciplinar é fundamental para resolução de problemas complexos e na co-criação das melhores soluções. Neste contexto, a nanotecnologia demonstrou desempenhar um papel muito relevante na integração do conhecimento em todas as áreas da ciência e tecnologia. O conjunto de Conferencias Mission 10.000 visa gerar ideias, projetos e soluções para os desafios societais, através da interligação da academia, da indústria, do setor político e da sociedade. Este evento constitui-se como uma oportunidade para a divulgação de investigação de excelência, para analisar e discutir soluções para as necessidades atuais e, bem assim, para explorar tecnologias emergentes que possam dar resposta a problemas no futuro próximo. A troca de conhecimento e informação assente numa perspetiva multi-stakeholder possibilitará uma compreensão única das interações existentes entre o meio académico, a indústria e a sociedade, contribuindo para identificar as boas práticas e políticas e promover a cooperação multilateral.

REGIÕES INTERREG-POCTEP REGIONS

PORTUGAL
Alentejo Central
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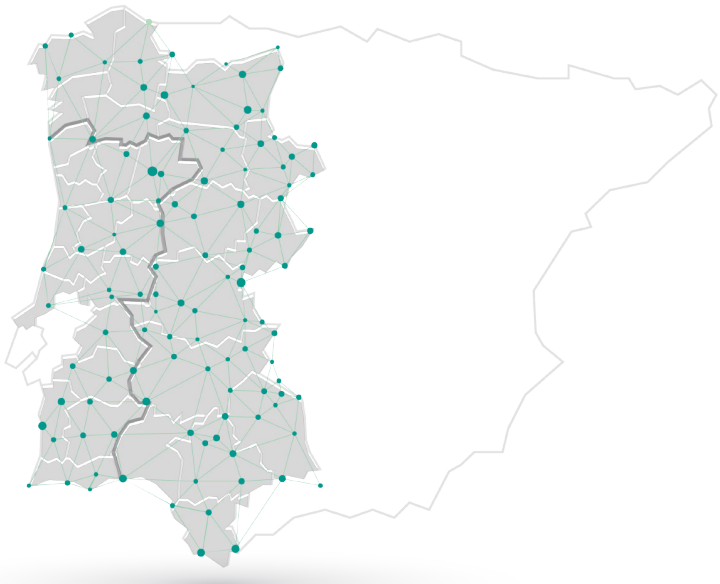
Alto Alentejo
Alto Minho
Alto Tâmega
Área Metropolitana do Porto
Ave
Baixo Alentejo
Beira Baixa
Beiras e Serra da Estrela
Cávado
Douro
Médio Tejo
Oeste and Alentejo Litoral
Região de Aveiro
Região de Coimbra
Região de Leiria
Tâmega e Sousa
Trás-os-Montes
Viseu Dão-Lafões



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NANOTECNOLOGIA: Facilitadora da BIOECONOMIA

Conferência Internacional nanoGateway | Outubro 17, 2018 | Altice FORUM, Braga (Portugal)

Bem-vindo à Mission10 000

O Laboratório Ibérico Internacional de Nanotecnologia (INL) organizou em 2018 a primeira conferência Internacional sobre nanotecnologia, em coloboração com os gabinetes Regionais de Desenvolvimento de Espanha e Portugal, do espaço cooperativo da zona POCTEP. A conferência realizou-se no dia 17 de Outubro de 2018 no Altice Forum Braga, em Portugal.

Esta conferência internacional fez parte do programa do INL Summit 2018, que teve como objetivo contribuir com novas ideas e aspectos que fomentem um ecosistema de inovação. O tema deste Summit foi "Nanotecnologia: um facilitador para a nova economia". O Mission 10.000 foi, neste contexto, uma grande oportunidade para destacar como a nanotecnologia já está a resolver os principais desafios do século XXI e para responder às perguntas: "o que a nanotecnologia pode fazer para mim e para o meu negócio?".

O objetivo deste evento foi fazer da Ciência e das Principais Tecnologias Facilitadoras parte do dia-a-dia das empresas ibéricas. Para isso, organizámos um excelente programa, com oradores internacionais de alto nível para um evento de um dia inteiro, ligando todas as oito regiões de Portugal e Espanha que fazem parte do Projeto nanoGateway, o promotor da Mission 10.000. A agenda científica foi desenvolvida pelo comité científico, selecionando temas como agricultura e floresta, indústria de alimentos e aquicultura. No total, foram apresentados 59 trabalhos, sendo 46 na categoria póster e 13 na categoria oral.

A nanotecnologia promete dar contribuições sólidas aos grandes desafios de hoje que, por sua vez, vão ter efeitos profundos na nossa economia. A explosão de produtos de IoT, big data e serviços de economia compartilhada são tendências na sociedade atual e a imensa interconectividade muda a sociedade moderna a um ritmo nunca antes visto. Aqui estão as ligações diretas para os conceitos da Indústria 4.0, Fábricas do futuro e Manufatura com valor agregado. Esses grandes desenvolvimentos sociais desafiam a sociedade. Mas as mudanças necessárias também promovem inovações disruptivas e, consequentemente, podem gerar imensas oportunidades de negócio. O núcleo da Missão 10.000 foi articular a importância da nanotecnologia e incentivar uma maior participação, interação e trabalho em rede, além de promover novos diálogos.

Lars Montelius
DG, INL

10 YEARS 2008-2018 | INL INTERNATIONAL IBERIAN NANOTECHNOLOGY LABORATORY

mission 10.000 conference

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Oradores

:: LARS MONTELIUS

Diretor Geral, INL - International Iberian Nanotechnology Laboratory

Desde 1 de setembro de 2014, Lars Montelius é o Diretor Geral do INL - Laboratório Ibérico Internacional de Nanotecnologia em Braga, Portugal.

Lars Montelius é professor titular em Nanotecnologia na Universidade de Lund, na Suécia. Durante 2003-2009, foi diretor do Departamento de Física das Faculdades de Ciências e Engenharia da Universidade de Lund.

De 2009-2011, foi diretor da Öresund University & Öresund Science Region, uma cooperação transfronteiriça entre onze universidades, três autoridades regionais e dois países na região de Öresund.

Entre 2007 e 2014, foi presidente do Comité Sueco de Padronização Técnica em Nanotecnologia e fundou várias empresas suecas que trabalham com nanotecnologia.

Atualmente, Lars também é presidente da IUVSTA - União Internacional para Ciência, Técnica e Aplicações em Vácuo, com mais de 150000 membros de 32 países e é membro do Grupo Executivo de Alto Nível (GAN) da CE na DG NMPB, membro do conselho e Presidente do Grupo de Trabalho das duas Plataformas Tecnológicas Europeias NANOFutures e EuMat.

:: MANUEL HEITOR

Ministro da Ciência, Tecnologia e Educação, Portugal

Manuel Heitor é Ministro da Ciência, Tecnologia e Ensino Superior do Governo de Portugal desde novembro de 2015. De março de 2005 a junho de 2011, foi Secretário de Estado da Ciência, Tecnologia e Ensino Superior.

Manuel Heitor é professor catedrático no Instituto Superior Técnico (IST) e foi fundador e diretor do Centro de Inovação, Tecnologia e Pesquisa de Políticas do IST, além de diretor do programa de doutoramento "Engenharia e Políticas Públicas, EPP" e "Projeto de Engenharia" do IST. Em 2011-12, foi um estudante visitante em Harvard.

Obteve o Doutoramento no Imperial College, Londres, em 1985, em pesquisa de combustão e fez o pós-doutoramento na Universidade da Califórnia, em San Diego. Seguiu depois uma carreira académica no IST, em Lisboa, onde foi vice-presidente no período 1993-1998. Desde 1995, é investigador do Instituto IC2 da Universidade do Texas, em Austin. É também membro fundador do Conselho de C & T do "International Risk Governance Council", IRGC. Foi co-fundador da rede europeia "ciência, tecnologia, educação e política para a Europa, step4EU".

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:: ANA TERESA LEHMANN

Secretária de Estado da Indústria, Governo de Portugal

Ana Lehmann é a Secretária de Estado da Indústria do Governo de Portugal. Antes de assumir o cargo em julho de 2017, desenvolveu uma carreira internacional fortemente focada e abrangendo a academia, a política pública e cargos executivos em mais de vinte organizações públicas e privadas. As suas áreas de especialização dizem respeito à competitividade das empresas e indústrias, nomeadamente a internacionalização das empresas, a atracção de investimento direto estrangeiro, a inovação, os clusters industriais e as políticas públicas.

Foi consultora de instituições internacionais (OCDE, UNCTAD, Comissão Europeia, entre outras) e vários governos nacionais e regionais nos cinco continentes. Ocupou diversas responsabilidades de gestão em diversas empresas e fundações, além de ter fundado diversas empresas. Foi Presidente da InvestPorto, Vice-Presidente da Autoridade do Governo Regional da Região Norte de Portugal, Presidente da Autoridade de Gestão do Programa Transnacional da Área Atlântica da União Europeia, Pró-Reitor de Planeamento Estratégico / Relações Empresariais (U.Porto) e esteve envolvida na criação da Agência Portuguesa de Investimento.

É professora de Economia (FEP-Universidade do Porto, Portugal) e é Chefe de Negócios Internacionais (Porto Business School). Professora Visitante ou Visiting Fellow em várias universidades dos EUA/Europa (por exemplo, Universidades de Strathclyde, Reading, Glasgow, Columbia, entre outras) e uma das 20 Fellows da European International Business Academy. Tem um mestrado e um doutoramento em Economia (University of Reading, UK) e uma licenciatura em Gestão (U.Porto). Palestrante regular em conferências de alto nível, Ana Lehmann foi editora de revistas científicas e é uma autora amplamente publicada no seu campo. É autora / editora de livros como Rethinking Investment Incentives: Tendências e Opções Políticas (2016), Empreendedorismo na Global Firm (2011) e Multinacionais, Clusters e Inovação: A Política Pública é Importante? (2006). Ganhou vários prémios por mérito científico e reconhecimento de carreira.

Oradores científicos

:: ORLANDO J. ROJAS

Editor-Chefe, Journal of Dispersion Science and Technology
Presidente da Plataforma de Materiais da Universidade de Aalto, Finlândia
Professor do Departamento de Bioprodutos e Biossistemas, Grupo Coloides Bio-baseados e Materiais (BiCMat), Escola de Engenharia Química, Universidade de Aalto, Finlândia
Pesquisador Principal do Centro de Excelência em "Engenharia Molecular de Materiais Híbridos Bio-sintéticos" (HYBER). Finlândia.

O Professor Orlando Rojas é presidente da Plataforma de Materiais da Universidade de Aalto, onde possui dupla afiliação com os departamentos de Bioprodutos e Biossistemas e Física Aplicada.

Ganhou o Prémio Anselme Payen em 2018, um dos maiores reconhecimentos na área da celulose e materiais renováveis. Foi eleito membro da American Chemical Society, a Academia Finlandesa de Ciências e Letras e recebeu o Prémio Tappi Nanotechnology de 2015. É co-PI do Centro de Excelência em Engenharia Molecular da Academia de Pesquisa de Materiais Híbridos Biossintéticos da Universidade da Finlândia, HYBER (2014-2019).

As suas bolsas de investigação mais recentes incluem o prestigiado European Research Commission Advanced Grant (ERC-Advanced) e o Academy of Finland Materials Bioeconomy Flagship. Publicou mais de 300 artigos revisados por pares relacionados com a pesquisa central do seu grupo, "Colóides e Materiais de Base Biológica", que lida principalmente com nanoestruturas de materiais renováveis e a sua utilização em sistemas multifásicos.

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:: TEKLA TAMMELIN

Investigadora Principal na área de Fibras e Pesquisa de Materiais Biobaseados e Docente em Tecnologia de Bioprodutos, Universidade Aalto

A Dra. Tekla Tammelin licenciou-se pela Universidade de Tecnologia de Helsínquia (agora Universidade de Aalto) em 2006. Trabalha numa rede de especialistas sénior na área de negócios VTT SONE (Soluções para Recursos Naturais e Meio Ambiente), tendo um papel interno como Investigadora Principal na área de responsabilidade de pesquisa estratégica "Materiais nanocelulósicos".

As suas áreas de especialização incluem o desenvolvimento de novos materiais de base biológica, especialmente materiais nanocelulósicos e hemiceluloses, bem como a formação de estruturas (filmes, espumas e teias) e as suas aplicações, compreendendo as interdependências da estrutura-função e o papel decisivo das interfaces. Atualmente, promove e cria conceitos inovadores de biomateriais tendo em vista futuras soluções inovadoras. Esses conceitos incluem estruturas de base biológica como membranas seletivas, materiais com embalagem inteligente e dispositivos eletrónicos e materiais energéticos.

É a principal inventora da recente patente relacionada com o método de preparação em larga escala para filmes de nanocelulose. Publicou cerca de 60 artigos revistos por pares e mais de 100 processos de reuniões científicas. Recebeu o Prémio Nobel de Investigação Nórdica da Akzo, em 2010, na área da química de superfície de fibras celulósicas, e em 2016 recebeu o Prémio VTT de Excelência Científica Excecional.

:: ASHOK PATEL

Professor Associado, Biotecnologia e Engenharia Alimentar no Instituto de Tecnologia Guangdong Technion Israel, China

O Dr. Ashok Patel, autor do livro "Rotas Alternativas à Estruturação de Petróleo (Springer, 2015)" e editor do livro "Estruturação de Óleo Comestível: Conceitos, Métodos e Aplicações (RSC, 2017)", trabalha atualmente como professor associado no Instituto de Tecnologia de Guangdong Technion de Israel em Shantou, na China.

Orgulha-se de ser um investigador em permanente mobilidade internacional que tem atuado na área de alimentos colóides em diferentes setores, incluindo a indústria (Unilever R&D Vlaardingen, Holanda), Universidade (Universidade de Ghent, Bélgica) e organização de investigação (Laboratório Ibérico Internacional de Nanotecnologia, Portugal).

A sua investigação anterior e atual está focada no uso de ingredientes de grau alimentar para criar novos sistemas estruturados (incluindo oleogéis, espumas, partículas coloidais e emulsões complexas) para resolver problemas de formulação no desenvolvimento de produtos alimentares. Tem mais de 80 publicações publicadas (mais de 50 como primeiro autor) na área de alimentos colóides. Para a sua investigação tem recebido financiamento individual de prestígio e altamente competitivo da Comissão Europeia, em 3 ocasiões diferentes (Bolsas de Estudo Internacionais Marie Curie, Bolsas de Inte-gração de Carreira Marie Curie, Bolsas Marie Curie Cofund Fellowship) e outros prémios e nomeações para Jovem Cientista. Em 2015, foi selecionado, numa oportunidade única, para participar no encontro Lindau Nobel Laureate como cientista visitante.

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Oradores Transversais

:: MARINELLA FARRÉ

Investigadora no IDEAEA-CSIC, Barcelona, Espanha

A Dra. Marinella Farré é PhD em Química pela Universidade de Barcelona (dezembro de 2003), e investigadora permanente do IDÆA-CSIC desde julho de 2008. Tem mais de 150 trabalhos científicos em jornais da SCI (índice H de 47), 22 capítulos de livros e é co-editora de um livro.

Supervisionou três teses de doutoramento e atualmente é o supervisora de quatro que estão a ser desenvolvidas. A investigadora está envolvida no estudo da ocorrência e impacto de micropoluentes orgânicos no meio ambiente, bem como no desenvolvimento e aplicações de novas ferramentas biológicas, como biossensores. Esteve também envolvida em mais de 30 projetos de investigação com fundos nacionais e da UE e foi coordenadora do projeto Sea-on-a-Chip.

:: PAULA GALVÃO

Diretora Negócios e Relações Estratégicas, INL

Paula Galvão trabalha no INL desde junho de 2011 e é diretora do departamento de Negócios e Relações Estratégicas. Tem uma experiência consolidada na realização de atividades relacionadas com programas de financiamento de IDT, estudos sobre políticas de inovação, desenvolvimento de estratégias de inovação e prestação de serviços de consultoria relacionados com inovação para empresas e instituições regionais.

Ao longo dos anos, ganhou uma experiência importante no estabelecimento de relações comerciais e no desenvolvimento de interações com instituições europeias e outras organizações de clientes públicas e privadas. No INL, é responsável por atividades relacionadas com a coordenação de Projetos Internacionais, exploração da tecnologia, desenvolvimento de negócios, estabelecimento de colaborações, incubadora do INL e programa de apoio às start-up, além de aconselhar os investigadores sobre esquemas de financiamento para a inovação. Iniciou sua carreira num escritório de transferência de tecnologia de uma universidade e, ao longo de sua carreira, ocupou vários cargos seniores e de gestão em empresas de consultoria. Paula Galvão é licenciada em Engenharia de Materiais pela Universidade do Minho (Portugal).

:: LUÍS MIRA

Presidente da Inovisa e Representante Nacional de Sistemas Agrícolas de Conhecimento e Inovação em Pesquisa Agrícola na Comissão Europeia, Portugal

Luís Mira da Silva é Professor Associado do Instituto Superior de Agronomia/Universidade de Lisboa. É licenciado em Engenharia Agronómica pelo Instituto Superior de Agronomia, doutoramento em Agricultural Systems pela University of Reading (UK), e fez um Executive MBA na London Business School/University of London (UK).

É Presidente da Inovisa (www.inovisa.pt), membro do Board da Agrinatura (http://agrinatura-eu.eu/), e Representante Nacional no subgrupo estratégico Agricultural Knowledge and Innovation Systems (AKIS) do Standing Committee on Agricultural Research (SCAR) da Comissão Europeia. É ainda coordenador de diversos projetos nacionais e internacionais (Europa e África) nas áreas da inovação, transferência de tecnologia e empreendedorismo no setor agro-alimentar.

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:: JUDIT ANDA

Coordenadora Rastreabilidade S3 e Big Data na Cadeia de Valor Agroalimentar e Coordenadora da DIH Andalucía AgroTech. Junta de Andaluzia, Espanha

Judit Anda é Engenheira Agrónoma pela Universidade de Córdoba, com Mestrado em Desenvolvimento Rural e Gestão de Empresas Agroalimentares e Mestrado em Avaliação do Impacto Ambiental. Durante oito anos (de 2006 a 2013), ocupou posições de Alto Cargo no Governo Regional da Andaluzia, onde desenvolveu a direção de políticas públicas relacionadas com o setor agroalimentar, a saúde animal, saúde vegetal, a regulamentação da indústria agropecuária, e o desenvolvimento de modelos relacionados com a política agrária comunitária.

Atualmente é Conselheira Técnica no Ministério do Governo Regional na Agricultura, Pesca e Desenvolvimento Rural da Andaluzia, em Espanha, onde é responsável pela Coordenação da Estratégia Andaluza da Bioeconomia, responsável de conteúdos e estratégias no Programa de Desenvolvimento Rural da Andaluzia (FEADER), e a promoção da digitalização na indústria agroalimentar, incluindo a coordenação da parceria Europeia S3 Agrifood: Rastreabilidade e Big Data na cadeia de valor Agroalimentar e a criação do DIH Andaluzia-Agrotech.

:: FABIO BOSCARELI

Coordenador Agroalimentar S3 Alta Tecnologia Agrícola, Itália

Fabio Boscaleri é assessor de política no escritório de ligação da Região da Toscana, em Bruxelas. As suas principais áreas de competência são as políticas ambientais, energéticas e agrícolas. É o coordenador de Bruxelas da Rede Informal das Regiões Europeias para a Inovação na Agricultura, Alimentação e Florestas (ERIAFF).

Com um forte interesse em projetos de redes e inovação, promoveu a criação de uma parceria temática sobre Agricultura de Alta Tecnologia sob a Plataforma S3 AGRIFOOD. É membro do Painel de Bioeconomia das Partes Interessadas Europeias para o período de 2016-2019 e é parceiro em dois projetos ativos de CSA H2020: NEFERTITI (Rede Europeia de Demo Farms) e ROSEWOOD (Rede de Regiões Europeias para a Mobilização de Madeira). No seu cargo anterior no Ministério da Agricultura da região da Toscana foi responsável pelas biotecnologias verdes e foi membro da Comissão Interministerial Italiana para a avaliação de organismos transgénicos

:: HEINER LINKE

Professor de Nanofísica e Diretor do NanoLund Center para Nanociência. Universidade de Lund, Suécia

Heiner Linke é professor de Nanofísica na Universidade de Lund, na Suécia. Entre 1998 e 2001, trabalhou como investigador em Sidney/Austrália, antes de ingressar no departamento de física da Universidade de Oregon em 2001, onde recebeu um mandato por tempo indeterminado, em 2005, e onde permaneceu até 2009.

Desde 2013, é Diretor do Centro de Nanociência na Universidade de Lund (NanoLund), um ambiente de investigação interdisciplinar que envolve cerca de 300 cientistas de três faculdades. Os seus interesses de investigação concentram-se na conversão de energia em nano-escala, incluindo motores moleculares e termoelétricos. Foi eleito membro da Academia Real de Ciências da Suécia (área de física) em 2014

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:: PAULO VILAÇA

Diretor de Operações da SilicoLife, Portugal

Paulo Vilaça tem um mestrado em Bioinformática, concluiu o doutoramento em Ciências da Computação e tem mais de 8 anos de experiência em funções de gestão técnica. Tem uma experiência sólida no desenvolvimento de software e engenharia.

É responsável pela gestão diária de uma equipa de desenvolvimento com mais de 15 pessoas que trabalham em biologia de sistemas e inteligência artificial aplicada a problemas de biotecnologia industrial.

:: ANTÓNIO BOB SANTOS

Administrador da ANI (Agência Nacional de Inovação) de Portugal

Especialista em Políticas de Inovação e em Inovação Aberta, António Bob Santos integra o Conselho de Administração da ANI desde julho de 2018, tendo inicialmente desempenhado o papel de Assessor para as Políticas de Inovação na mesma instituição (2017/2018).

Desde 2001 que colabora com várias estruturas governamentais na área da Política de Inovação, tendo integrado as equipas de conceção, gestão e monitorização do PROINOV (Programa Integrado de Apoio à Inovação), do Plano Tecnológico, da Agenda Digital, da Estratégia de Lisboa, do Plano Nacional de Reformas e do Programa Nacional para o Empreendedorismo e Inovação (+E+I). António Bob Santos foi gestor de projetos de inovação na UMIC (Agência para a Sociedade do Conhecimento), com responsabilidades na conceção de iniciativas como o NEOTEC, OTIC, Centros de Excelência da b-on (Biblioteca do Conhecimento Online), e tendo colaborado na gestão de projetos de Smart Cities no CEiiA.

É Doutorado em Economia pelo ISCTE-IUL (Instituto Universitário de Lisboa), instituição onde concluiu o Mestrado em Ciências do Trabalho (2002) e a Licenciatura em Economia (1998). António Bob Santos foi também docente convidado em Mestrados do Instituto Politécnico de Santarém (2008-2012) e do ISCTE-IUL (2017/2018).

:: VICTORIA LEY

Chefe da Divisão de Coordenação, Avaliação e Acompanhamento da Agência de Investigação Espanhola

Doutorada em Bioquímica e Biologia Molecular pela Universidade Autónoma de Madrid, fez a sua tese de doutoramento no Centro de Biologia Molecular Severo Ochoa e pós-doutoramento no Centro Médico na Universidade de New York (Nova York, EUA, 1986-1989) e no Instituto Pasteur (Paris, França, 1989-1991).

Trabalhou como investigadora na área de virologia em 2003, quando ingressou na Agência Nacional de Avaliação e Prospetiva (ANEP) e permaneceu como diretora até 2012. Em 2013, iniciou uma nova linha de atuação na área da atividade física e a sua associação com doenças crónicas.

É responsável pela avaliação científica, seleção e acompanhamento de todos os programas financiados pela Agência, bem como inúmeras chamadas financiadas por universidades e instituições privadas regionais.

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:: JESUS ESCUDERO

Relações Internacionais INIA (Instituto Nacional de Investigação e Tecnologia Agrícola e Alimentar). PCN espanhol para o H2020 - Societal Challenge 2 Bioeconomia

É licenciado em Biologia pela Universidade Complutense (Madrid, Espanha) e doutorado em Biologia Molecular de Plantas pela Universidade de Basileia (Suíça).

Desenvolveu uma carreira em ciência aplicada à agricultura em vários Centros de Investigação, tanto nacionais como internacionais e trabalhou na indústria de biotecnologia (Mogen Intenatinal - Zeneca Agrochemicals, Syngenta Ltd.). Participou em projetos científicos apoiados por grandes organizações científicas, como a European Molecular Biology Organization e a Human Frontier Science Program Organization. Posteriormente, desempenhou funções de avaliação e gestão técnica de projetos de P&D&I.

Atualmente, é responsável pelas Relações Internacionais do INIA (Instituto Nacional de Investigação em Tecnologia Agrícola e Alimentar), em Espanha, sendo Ponto Nacional de Contacto para o Societal Challenge 2 – Bioeconomia, dentro do Programa Quadro Europeu para a Investigação e Inovação "Horizonte 2020".

:: JOÃO NUNES

Presidente e Diretor Executivo da Associação BLC3 – Campus de Tecnologia e Inovação, Portugal

Formação académica: Doutorado em Biociências (ecologia e cadeias de valor de Biorrefinarias) e mestrado e licenciatura pré Bolonha em Engenharia Mecânica: Energia e Ambiente.

Experiência profissional /Atividade docente e pedagógica: De 2016 a 2018, no curso de Gestão Bioindústrias: de 2007 a 2010, nos cursos de Eng. Mecânica e Eng. do Ambiente da FCTUC nas áreas de Resíduos Sólidos, Ecologia Industrial e Gestão Ambiental e Gestão Energética, de 2011 a 2016 no Mestrado Biodiversidade e Biotecnologia Vegetal na área de empreendedorismo, e mais recentemente na Licenciatura em Gestão de Bioindústrias, nas áreas de Biorrecursos, Energia e Ambiente, Bioeconomia e Tecnologias de Bioprocessos e palestrante desde 2010 no ISEC na Disciplina de "Energias Alternativas"; desde 2015, Orientador Científico em contexto Empresarial de seis doutoramentos na área da biotecnologia industrial; desde 2015, Orientador de seis Teses de Mestrado na área das Biorrefinarias, Micologia, Avaliação de Ciclo de Vida e Sistemas Energéticos e Agroalimentares, de 2007 a 2010, Co-orientação de projetos de investigação dos Cursos de Mestrado Integrado de Engenharia do Ambiente e de Engenharia Mecânica da Faculdade de Ciências e Tecnologias da Universidade de Coimbra (FCTUC): Bio-combustíveis de 2ª Geração; Aproveitamento e Gestão de Resíduos; Avaliação de Ciclo de Vida; Ecologia Industrial; e Otimização Tecnológica Integrada.

Atividades e experiências profissionais: Fundador e Presidente da Associação BLC3 – Campus de Tecnologia e Inovação, Fundador e Presidente da All - Associação Portuguesa para a Bioeconomia e Economia Circular; Membro do Grupo de Trabalho e Acompanhamento do Desafio Societal nº2: Desafio Societal 2 – Segurança Alimentar, Agricultura e Silvicultura Sustentável, Investigação Marinha e Marítima e Águas Interiores e Bioeconomia; Membro da RIS3 - Região Centro (grupo de trabalho da definição das estratégias de especialização inteligente); Membro do Comissão Consultiva do Mestrado Integrado em Inovação em Artes Culinárias da Escola Superior de Hotelaria e Turismo do Estoril; Membro do conselho consultivo, pelo contexto do estado membro português, do projeto SCREEN: Synergic Circular Economy Across European Regions, Co-coordenador de Inovação da Agenda de I&I para a Economia Circular 2030 da FCT, Membro da equipa de avaliação do Orçamento Participativo Portugal na área da Ciência.

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:: SONIA PAZOS

Negócios e Relações Estratégicas, INL

Sonia Pazos ingressou no INL em junho de 2017 como Oficial de Negócios e Relações Estratégicas com foco em Parcerias Público-Privadas de Desenvolvimento de Negócios e Estratégias. Possui um mestrado em Gestão de Negócios, Investimento e Finanças e uma formação complementar em Gestão de Inovação, Gestão de Talentos e Gerenciamento de Projetos (PMO's, metodologias ágeis).

Tem um conhecimento profundo das políticas de Inovação e Transferência de Tecnologia, das metodologias e instrumentos, combinando experiência substancial em cargos de gestão em entidades públicas e privadas: Diretora de Centros de Tecnologia na GAIN Innovation Agency (Governo Regional), Gerente de Inovação na FEUGA - Enterprise- University Foundation, Diretora Interina Público-Privado e Consultora durante quase 20 anos. Foi responsável pela conceção e implementação de estratégias de inovação e transferência de tecnologia, políticas, programas, instrumentos, projetos multi-ator e parcerias público-privadas, focadas principalmente em I&D orientada para o setor industrial, inovação orientada para o design e orientada para o utilizador, entrega de inovação e implantação de tecnologia.

:: MARTA CANDEIAS

NCP Portuguesa do Programa-Quadro Investigação & Desenvolvimento H2020 para Nanotecnologia, Materiais Avançados e Produção

É o Ponto de Contacto Nacional para as Principais Tecnologias Facilitadoras "Nanotecnologias, Materiais Avançados, Processos Avançados e Fabricação" e para o SME Innovation Program, com especial ênfase no SME Instrument e Fast Track to Innovation.

Marta Candeias é licenciada em Engenharia Biológica pela Universidade Técnica de Lisboa (Instituto Superior Técnico) e tem um mestrado na mesma área, com especialização em disciplinas na área dos biomateriais. Atua como Ponto de Contacto Nacional (NCP) para a Investigação e Desenvolvimento de Programas de Desenvolvimento Tecnológico da União Europeia desde 2009 (FP7 e Horizonte 2020) sobre os temas das nanociências, nanotecnologias, materiais avançados, processos, fabricação avançada e SMEs. Entre 2007 e 2009, foi investigadora no Instituto Superior Técnico e participou em alguns projetos nacionais e europeus. Desde 2009, tem participado em projetos para a integração e construção da capacitação das aplicações do NCP nos temas que acompanhou no FP7 (PMES Health, TrasnCoSME, NMP TeAm e NMP TeAm 2).

:: TERESA BERNAL

Diretora do Departamento de Serviços e Observatório da Inovação da Agência Galega de Inovação (GAIN), Espanha

Teresa Bernal Cortegoso é licenciada em Direito pela Universidade da Corunha, Espanha.

Funcionária pública na administração geral da Xunta de Galiza desde 1999, exerceu inicialmente funções no domínio das políticas ativas de emprego e de análise do mercado de trabalho e, desde 2015, é responsável pelo departamento de assessoria, apoio e angariação de fundos para empresas e empresários inovadores na Agência Galega de Inovação. Para além disso, colabora como docente em cursos de pós-graduação e programas de mestrado na área de emprego e inovação.

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:: INÊS SANTOS SILVA

Assessora do Gabinete da Secretária de Estado da Indústria, Governo de Portugal

Inês Santos Silva é Assessora no Gabinete do Secretário de Estado Português da Indústria. Desde 2010, Inês tem sido um dos membros mais ativos no âmbito das startups portuguesas, lançando várias iniciativas para apoiar empreendedores, startups e investidores. Entre os projetos que cofundou estão o Startup Pirates, um programa de pré-aceleração de uma semana para aspirantes a empreendedores e o PortugalStartups.com, um portal de notícias sobre as startups portuguesas.

:: JESÚS ALONSO

Secretário-Geral de Ciência, Tecnologia e Inovação. Junta de Extremadura, Espanha

O Dr. Jesús Alonso é doutorado em Ciências Biológicas pela Universidade Complutense de Madrid. É titular científico do CSIC desde 2006, desenvolvendo a sua atividade no Instituto de Ciências e Tecnologia de Alimentação e Nutrição, com uma grande experiência na gestão de projetos de R&D, assim como no campo da inovação tecnológica na cadeia alimentar.

Foi Diretor-Geral da Inovação e Competitividade Empresarial e, posteriormente, foi diretor geral da Ciência e Tecnologia, partic-ipando na elaboração da Lei Regional de Ciência, Tecnologia e Inovação, na criação do Centro de Investigações Científicas e Tecnológicas da Extremadura (CICYTEX) e do Parque Científico e Tecnológico da Extremadura, assim como a gestão dos Planos Regionais de R&D&I e do Programa Regional de Inovação

:: BEATRIZ ASENSIO

Diretora da Unidade de Programas Europeus do Instituto para a Competitividade Empresarial de Castela e Leão, Espanha

Beatriz Asensio é licenciada em Engenharia Química pela Universidade de Valladolid, em Espanha, e possui um mestrado em Engenharia e Tecnologia Ambiental pela Universidade Politécnica da Catalunha. Após vários cargos relacionados com a investigação, desenho e gestão de plantas energéticas em entidades privadas, desde 2006, trabalhou como gestora de projetos de R&D, promovendo a participação de entidades de Castela e Leão em programas de R&D europeus e internacionais e dando apoio direto a empresas de âmbitos setoriais muito diferentes. Atualmente, é a Responsável pela Unidade de Programas Europeus do Instituto para a Competitividade Empresarial de Castela e Leão.

:: PEDRO CARNEIRO

Negócios e Relações Estratégicas, INL

Pedro Carneiro trabalha no INL desde abril de 2016 como Oficial de Negócios e Relações Estratégicas, utilizando o seu conhecimento nas áreas da ciência e da indústria para promover e estabelecer novos projetos nacionais e internacionais. Tem uma sólida experiência em Administração Geral, com funções de liderança nas áreas de gestão pública de Ciência e Tecnologia, Administrativa, Marketing, Vendas e funções de Administração Geral, em empresas locais e multinacionais (Unilever-Jerónimo Martins, ONI Telecom e Grupo Bertrand-Circulo Leitores (BertelsmannPublishing)), e no sector público (VP da FCT, agência portuguesa de financiamento da ciência e tecnologia). Isto ofereceu-lhe uma vasta experiência de interação e negociação tanto com IGO's científicas internacionais como com grupos de trabalho da União Europeia.

Atualmente, colabora com a Universidade Católica Portuguesa, onde é coordenador do Projeto de Ciências Médicas, leciona Estatística (Graduação) e Projetos de Consultoria Estratégica em Gestão (MSc) na escola de negócios como professor visitante. Pedro é formado em Economia pela Universidade Católica Lisboa e possui um MBA pela Nova Business School.

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:: JOANA BRANCO

Diretora de Inovação, Biocant Park, Portugal

Doutorada em Ciências Biomédicas (Baylor College of Medicine - Houston, EUA; ICBAS-Universidade do Porto), e com uma especialização em Empreendedorismo pela Porto Business School, Joana é cofundadora da Gene PreDiT, empresa de biotecnologia dedicada ao desenvolvimento de uma nova terapia para a obesidade.

Juntou-se à equipa do Biocant Park em 2015, onde as suas competências em empreendedorismo, criação de empresas, acompanhamento e transferência de tecnologia, desenvolvimento de negócio em projetos de base cientifica e angariação de financiamento se tornam uma mais-valia. Com base na sua experiência é frequentemente oradora e mentora em programas de apoio ao desenvolvimento de ideias e de promoção ao empreendedorismo.
Atualmente é Innovation Director no Biocant Park onde se dedica à promoção da inovação em Biotecnologia e internacionalização do setor.

:: SOUMODIP SARKAR

Presidente Executivo da "PACT – Parque do Alentejo de Ciência e Tecnologia"
Membro do Asia Center, Universidade de Harvard
Professor Catedrático e Vice-Reitor de Inovação, Cooperação e Empreendedorismo da Universidade de Évora, Portugal

Soumodip Sarkar é Professor Catedrático do Departamento de Gestão da Universidade de Évora, Portugal, e investigador no CEFAGE-UE. Atualmente, é também Associado (parceiro não-residente) do Centro da Ásia na Universidade de Harvard. É ainda vice-reitor da Universidade de Évora, bem como Presidente Executivo do Science Park of the region (PACT). É o Presidente da Equipa de Avaliação Externa da Comissão de Avaliação das Universidades Portuguesas (A3ES), na área da Gestão em Portugal. Internacionalmente, faz parte da equipa de acreditação da CEEMAN.

Os seus atuais interesses de investigação incluem inovação, empreendedorismo e sustentabilidade. A sua investigação recente foi publicada em jornais de renome tais como: Scientometrics, Journal of Business Venturing, Journal of Small Business Management, European Management Journal, Entrepreneurship & Regional Development, Technology Forecasting and Social Change, Journal of Business Research, Service Business, Sustainability, Journal of Cleaner Production, Journal of Knowledge Economy, European Journal of Innovation Management, Service Industries Journal, Trends in Food Science and Technology, Regional Science and Urban Economics, Energy Journal, entre outros. Publicou quatro livros sobre empreendedorismo e inovação, e o seu livro mais recente, "EntreSutra", foi publicado pela Bloomsbury em maio de 2018. Além disso, tem sido coordenador e membro da equipa de dezesseis projetos internacionais (financiados pela UE) bem como projetos regionais. Atualmente, está envolvido em nove projetos diferentes.

O Professor Sarkar deu um grande número de palestras internacionais e é um speaker muito procurado para falar sobre a relevância do empreendedorismo e inovação na sociedade. Como prova disso, tem merecido destaque nos média nacionais e internacionais, incluindo o Economist e a BBC. Em 2008, foi reconhecido como um dos 100 melhores especialistas em inovação (WEF-McKinsey).

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BRAGA

Situada no norte de Portugal, Braga é a cidade mais antiga do país e um belo destino com rica tradição culinária e arquitetura deslumbrante. Esta cidade moderna abriga o icónico Santuário de Bom Jesus, igrejas e monumentos impressionantes.

Construída há mais de 2.000 anos, "Bracara Augusta" foi fundada pelo imperador romano Augusto. Estava localizada numa das principais estradas romanas da Península Ibérica, era a sede administrativa do Império e, posteriormente, recebeu o estatuto de capital da província romana de Gallaecia, atual Galiza, pelo imperador Caracalla. A diocese de Braga é a mais antiga de Portugal. Na Idade Média, a cidade competia com Santiago de Compostela em poder e importância. Um dos "Caminos de Santiago" passou por aqui quando este popular culto de peregrinação cresceu após a Reconquista cristã e a fundação de Portugal.

A **Catedral de Braga** é também a mais antiga do país e foi construída no século XII pelos pais do primeiro rei de Portugal, D. Henrique e D. Teresa, que estão ali sepultados. Braga é, ainda hoje, um dos principais centros religiosos do País, tendo as comemorações da Semana Santa e as Festas Populares de São João como destaques no calendário litúrgico e turístico.

Além do Tesouro-Museu da Sé, vale a pena visitar o Museu dos Biscainhos, instalado num palácio Barroco, um período marcante na história de Braga, bem como o Museu Arqueológico D. Diogo de Sousa, já que, na cidade, também abundam os restos da era romana. Sugerimos um passeio ao redor do centro histórico para visitar algumas das muitas igrejas, admirar as casas e edifícios históricos, como o Palácio do Raio, o Theatro Circo ou o Arco da Porta Nova, e tomar um café na emblemática Brasileira com vista para a movimentada Avenida Central. No entanto, Braga também é considerada a cidade mais jovem de Portugal e, dos seus marcos contemporâneos, destaca-se o Estádio Municipal de Braga, projetado por Souto Moura, um dos arquitetos portugueses mais prestigiados e vencedor do Prémio Pritzker.

O **Theatro Circo** foi promovido em 1906 por um grupo de bracarenses, liderado por Artur José Soares, José António Veloso e Cândido Martins. Até essa data, a cidade tinha apenas o pequeno Teatro São Geraldo. Em 1911, o projeto começou a ganhar forma pelas mãos do arquiteto João de Moura Coutinho e a 21 de abril de 1915 foi inaugurado o Theatro Circo, coincidindo com um período de grande desenvolvimento económico e social em Braga. Ao longo das décadas, o espaço passou por profundas obras de reabilitação, para converter o Theatro Circo num grande complexo cultural, equipado com a mais moderna e completa tecnologia cénica e sonora, capaz de atender às necessidades da arte contemporânea nas mais diversas dimensões.

Praça da República
Mais info: https://visitbraga.travel/braga

Catedral da Sé de Braga
Mais info: braga.360portugal.com

Theatro Circo
Mais info: www.theatrocirco.com/en

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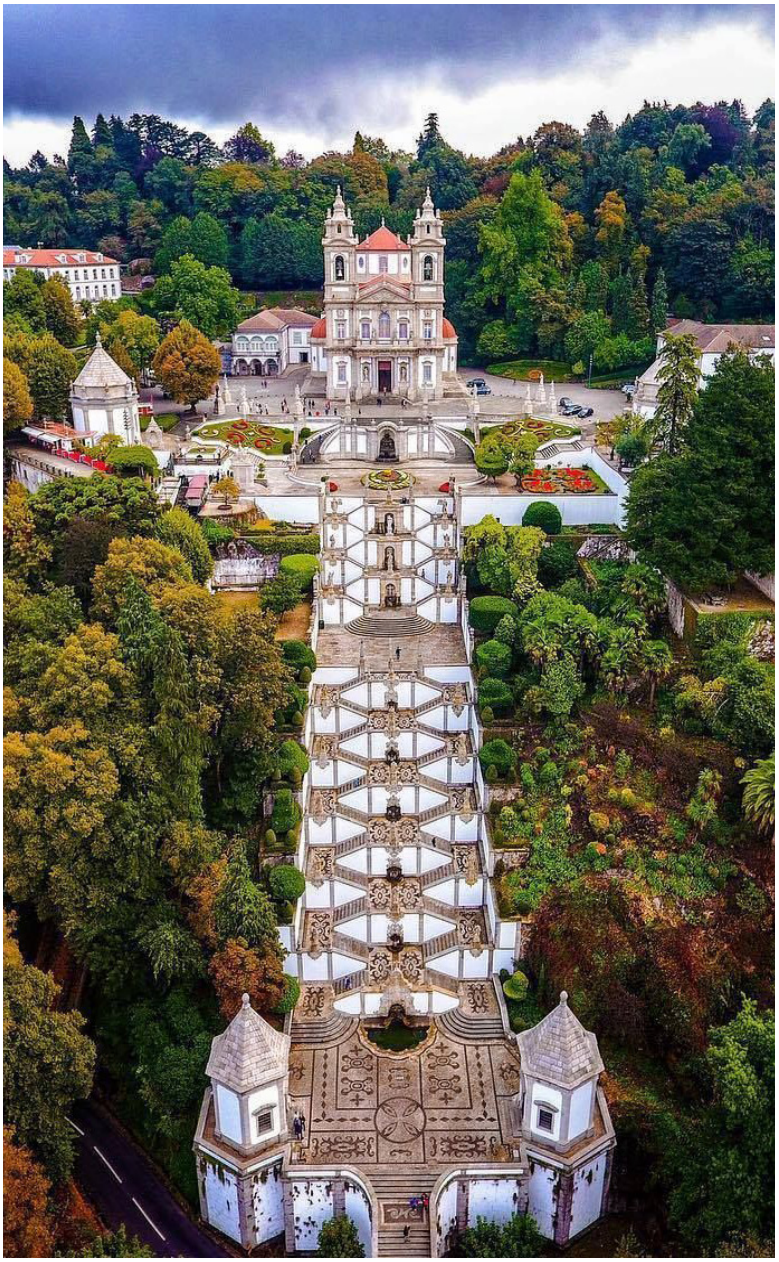

Bom Jesus de Braga
Mais info: www.youtube.com (Aerial view in 4k)
https://bragacool.com/visitar/bom-jesus-monte
https://www.travelingwithaga.com/how-to-visit-bom-jesus

Aqui você pode baixar um guia de turismo e mais informações sobre Braga:
https://visitbraga.travel/pub/media/guia/roteiro_braga.pdf

Todo o visitante de Braga deve ir ao **Santuário do Bom Jesus,** um ícone da cidade, com a sua escadaria monumental, declarado Património Mundial pela UNESCO em 2019. Situado no meio de uma extensa área de vegetação, oferece uma excelente vista panorâmica da cidade, assim como outras duas igrejas próximas: o Santuário da Nossa Senhora do Sameiro, um importante local de culto mariano, e a Igreja de Santa Maria da Falperra.
O **Bom Jesus** é considerado um dos santuários mais bonitos de Portugal e uma referência da arte barroca no País, com uma história que remonta ao século XIV.
Para chegar ao topo, pode usar-se a famosa escadaria que leva à igreja neoclássica, com 581 degraus, cercada por jardins e hotéis magníficos. Como alternativa, pode optar-se pelo elevador que sobe até ao topo da escada. Este elevador, em operação desde 1882, é único na Península Ibérica e o mais antigo do mundo ainda ativo. O elevador é movido por contrapeso de água, com duas cabines, que são ligadas por um cabo. O funcionamento original deste elevador faz dele uma das peças de engenharia mais extraordinárias de Portugal.
Além disso, também é possível levar o carro até o topo e fazer um piquenique nos magníficos jardins de Bom Jesus e, assim, desfrutar do ar fresco da natureza e de um cenário de tirar o fôlego. O pôr do sol visto daqui dá um novo sentido ao conceito de "hora de ouro".

Nos últimos anos, a Universidade do Minho e a qualidade da arquitetura contemporânea criaram uma atmosfera de vibração juvenil que levou esta cidade antiga a um nível inesperado de modernidade.

Todos esses atributos foram essenciais para Braga ser considerada o **Segundo Melhor Destino da Europa em 2019** no concurso promovido pela "**European Best Destinations**".

Jardim de Santa Bárbara
Mais info: braga.360portugal.com

NANOTECNOLOGIA: Facilitadora da BIOECONOMIA

Conferência Internacional nanoGateway | 17 de Outubro, 2018 | Altice FORUM, Braga (Portugal)

Principais parceiros:

Organizador:

Interreg-POCTEP parceiros regionais:

Interreg
España - Portugal
Fondo Europeo de Desarrollo Regional
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nano GATEWAY

mission 10.000
conference

MISSION 10.000: THE BIOECONOMY

Altice Forum, Braga, PORTUGAL
17 de Octubre, 2018

Versión en Español

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NANOTECNOLOGÍA:
Facilitando la BIOECONOMÍA

Bienvenido a Nanogateway

Nanogateway es un proyecto orientado a implementar una estrategia plurirregional y un plan de acción para desbloquear el potencial de la nanotecnología para generar crecimiento inteligente, riqueza y bienestar.

El proyecto **nanoGateway,** cofinanciado por el Programa de Cooperación Interreg V-A España-Portugal (POCTEP), está liderado por el INL y cuenta con la participación de las Agencias de Desarrollo Regional POCTEP.

Conferencia Mission 10.000

La investigación interdisciplinar es necesaria para abordar problemas complejos y co-crear las mejores soluciones. En este contexto, la nanotecnología ha demostrado desempeñar un papel importante en la integración de conocimiento a través de todas las áreas de la ciencia y la tecnología. La serie Misión 10.000 tiene como objetivo generar ideas, proyectos y soluciones para los desafíos de la sociedad uniendo academia, industria, sector político y sociedad. Este evento ofrecerá la oportunidad de mostrar investigación excelente, analizar soluciones para las necesidades actuales y explorar tecnologías emergentes que puedan resolver problemas en el futuro cercano. El intercambio de conocimiento e información desde una perspectiva multi-actor proporcionará una comprensión única de las interacciones que existen entre la academia, la industria y la sociedad, ayudando a identificar buenas prácticas y políticas, así como a promover la cooperación multilateral.

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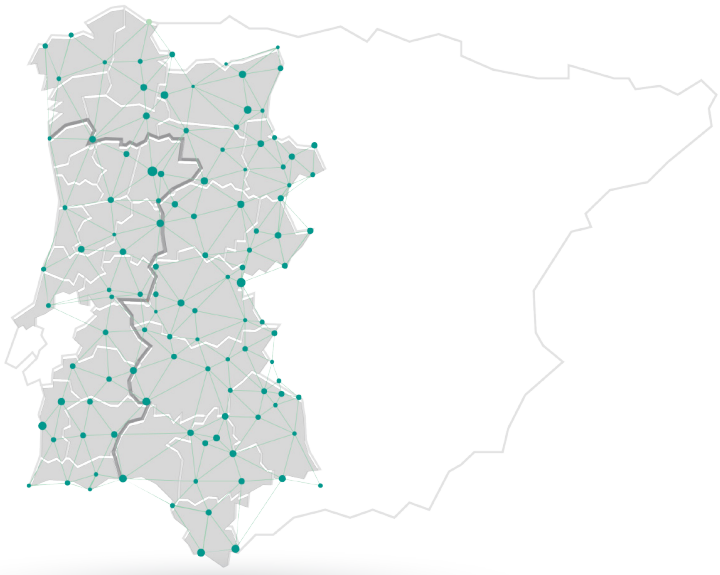

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Bienvenido a Mission10 000

El Laboratorio Ibérico Internacional de Nanotecnología (INL) organizó en 2018 la Primera Conferencia Internacional Ibérica sobre Nanotecnología, en colaboración con las Oficinas Regionales de Desarrollo de España y Portugal del espacio cooperativo zona POCTEP V/A España - Portugal. La Conferencia tuvo lugar el día 17 de octubre de 2018 en el Altice Forum Braga en Portugal.

Esta conferencia internacional fue parte de INL Summit 2018, que tuvo como objetivo aportar nuevas ideas y aspectos que fomentan un ecosistema de innovación. El tema de esta Cumbre fue "Nanotecnología: un facilitador para la Nueva Economía". Mission 10.000 fue una gran oportunidad para resaltar cómo la nanotecnología ya está resolviendo los principales desafíos del siglo XXI y para responder a las preguntas: "¿Qué puede hacer la nanotecnología para mí y para mi negocio?"

Nuestro objetivo fue hacer que la Ciencia y las Tecnologías de Habilitación Clave fueran parte de la rutina diaria de las compañías ibéricas. Para ello, hemos establecido un programa sobresaliente, con oradores principales internacionales de muy alto nivel para un evento de día completo, que unió a las 8 regiones de Portugal y España que forman parte del programa nanoGateway, el promotor de Mission 10.000.
La agenda científica, fue desarrollada por el comité científico, seleccionando temáticas como agricultura y floresta, industria alimentaria y acuicultura. Un total de 59 trabajos fueron presentados, 46 en categoría póster y 13 categoría oral.

La nanotecnología tiene promesas para hacer contribuciones sólidas a los grandes desafíos de hoy que, a su vez, tendrán profundos efectos en nuestra economía. La explosión de productos de IoT, datos masivos y servicios de economía compartida son mega tendencias de la sociedad actual y la inmensa interconectiv¬idad cambia a la sociedad moderna a un ritmo nunca antes visto. Aquí hay enlaces directos a los conceptos de Industria 4.0, Fábricas del futuro y Fabricación con valor agregado. Estos grandes desarrollos sociales desafían a la sociedad. Pero los cambios necesarios también fomentan innovaciones disruptivas y, en consecuencia, pueden generar inmensas oportunidades económicas. El núcleo de la Mission 10.000 es articular la importancia de la nanotecnología y fomentar una mayor participación, interacción y creación de redes, y propiciar nuevos diálogos.

Lars Montelius
DG, INL

10 YEARS 2008-2018 | INL INTERNATIONAL IBERIAN NANOTECHNOLOGY LABORATORY

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Oradores

:: LARS MONTELIUS

Director General, INL - Iberian International Nanotechnology Laboratory

Desde el 1 de septiembre de 2014, Lars Montelius es el Director General de INL - Laboratorio Internacional de Nanotecnología Ibérica en Braga, Portugal.

Es profesor titular de nanotecnología en la Universidad de Lund, Suecia y fue Decano del Departamento de Física, Facultades de Ciencias e Ingeniería, Universidad de Lund, durante el período 2003-2009.
Desde 2009-2011, fue director de la Univer-sidad de Öresund y la Región de la Ciencia de Öresund, siendo una cooperación transfronteriza entre once universidades, tres autoridades regionales y dos países de la Región de Öresund. Entre 2007 y 2014, fue presidente del Comité Sueco de Normalización Técnica sobre Nanotecnología y es el fundador de varias empresas suecas que trabajan con nanotecnología.

Actualmente, también es presidente de IUVSTA - La Unión Internacional para Ciencia, Técnica y Aplicaciones del Vacío con más de 150000 miembros de 32 países y es miembro del Grupo de Alto Nivel Ejecutivo (HLG) de la CE en la DG NMPB, el miembro de la junta y Presidente del Grupo de Trabajo de las dos Plataformas Tecnológicas Europeas NANOFutures y EuMat

:: MANUEL HEITOR

Ministro de Ciencia, Tecnologia y Educación, Portugal

Manuel Heitor es Ministro de Ciencia, Tecnología y Educación Superior en el Gobierno de Portugal desde noviembre de 2015. Desde marzo de 2005 hasta junio de 2011 se desempeñó como Secretario de Estado de Ciencia, Tecnología y Educación Superior.

Manuel Heitor es profesor titular en el Instituto Superior Técnico, IST, la escuela de ingeniería de la Universidad de Lisboa y fue fundador y director del "Centro de Innovación, Tecnología e Investigación de Políticas" de IST, así como director del IST´. Programas de doctorado en "Ingeniería y Políticas Públicas, PPE" y en "Diseño de Ingeniería". En 2011-12 fue profesor visitante en Harvard. Obtuvo un doctorado en el Imperial College de Londres en 1985 en investigación de combustión y realizó una formación postdoctoral en la Universidad de California en San Diego. Luego siguió una carrera académica en IST, en Lisboa, donde se desempeñó como Vicepresidente durante el período 1993-1998. Desde 1995, ha sido investigador asociado del Instituto IC2 de la Universidad de Texas en Austin.

Es miembro fundador del Consejo C&T del "Consejo Internacional de Gobernanza del Riesgo", IRGC. Fue cofundador de la red europea "ciencia, tecnología, educación y política para Europa,

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:: ANA TERESA LEHMANN

Secretaria de Estado de Industria, Gobierno de Portugal

Ana Lehmann es la Secretaria de Estado de Industria del Gobierno portugués. Antes de asumir el cargo en julio de 2017, desarrolló una carrera internacional fuertemente enfocada de dos décadas que abarca la academia, la política pública y los cargos ejecutivos en más de veinte organizaciones públicas y privadas.
Sus áreas de especialización se relacionan con la competitividad de empresas e industrias, en particular la internacionalización de las empresas, la atracción de inversión extranjera directa, la innovación, los clusters industriales y las políticas públicas. Ha sido consultora de importantes instituciones internacionales (OCDE, UNCTAD, Comisión Europea, entre otras) y de varios gobiernos nacionales y regionales en los cinco continentes.
Ella tuvo una variedad de responsabilidades gerenciales en varias compañías y fundaciones, además de haber fundado varias compañías. Ha sido directora general de InvestPorto, vicepresidenta de la Autoridad del Gobierno Regional de la Región Norte de Portugal, Presidenta de la Autoridad de Gestión del Programa Transnacional del Área del Atlántico de la Unión Europea, Pro rectora de Planificación Estratégica / Relaciones Empresariales y ha participado en la creación de la Agencia Portuguesa de Inversiones.

Es profesora de economía (FEP-Universidad de Oporto, Portugal) y ha sido Directora de Negocios Internacionales (Porto Business School). Profesor visitante o miembro visitante en varias universidades de EE. UU. / Europa (por ejemplo, Universidades de Strathclyde, Reading, Glasgow, Columbia, entre otras), y Presidente y uno de los 20 becarios de la Academia Europea de Negocios Internacionales. Tiene una maestría y un doctorado en economía (University of Reading, Reino Unido) y una licenciatura en administración (U.Porto).
Como ponente habitual en conferencias de alto nivel, ha sido editora de revistas científicas y es una autora ampliamente publicada en su campo. Es autora / editora de libros como Rethinking Investment Incentives: Trends and Policy Options (2016), Entrepreneurship in the Global Firm (2011) y Multinacionales, Clusters and Innovation: ¿Importa la política pública? (2006). Ha ganado varios premios por mérito científico y reconocimiento profesional.

Oradores Cientificos

:: ORLANDO J. ROJAS

Presidente de la Plataforma de Materiales, Universidad Aalto de Finlandia; Profesor del Departamento de Bioproductos y Biosistemas, grupo de investigación Bio-Based Colloids and Materials (BiCMat), Escuela de Ingeniería Química, Universidad Aalto de Finlandia
Investigador Principal del Centro de Excelencia en "Ingeniería Molecular de Materiales Híbridos Biosintéticos" (HYBER) de Finlandia

Profesor Orlando Rojas es presidente de la Plataforma de Materiales de la Universidad de Aalto, donde tiene doble afiliación con los departamentos de Bioproductos y Biosistemas y Física Aplicada. Ganó el Premio Anselme Payen en 2018, que es uno de los mayores reconocimientos en el área de la celulosa e materiales renovables. Fue elegido miembro de la American Chemical Society, la Academia Finlandesa de Ciencias e Letras y es el destinatario del Premio Tappi Nanotechnology de 2015. Es co-PI del Centro de Excelencia en Ingeniería Molecular de la Academia de Investigación de Materiales Híbridos Biosintéticos de la Universidad de Finlandia, HYBER (2014-2019).

Sus últimas becas de investigación incluyen el prestigioso European Research Commission Advanced Grant (ERC-Advanced) y el Academy of Finland Materials Bioeconomy Flagship. Ha publicado más de 300 artículos revisados por pares relacionados con la investigación central de su grupo, "Coloides e Materiales de Base Biológica", que se ocupa principalmente de nanoestructuras de materiales renovables e su utilización en sistemas multifásicos.

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:: TEKLA TAMMELIN

Investigadora principal en Fibras y Materiales Bioinspirados, Universidad Aalto de Finlandia; Docente en Tecnología de Bioproductos, Universidad Aalto de Finlandia; Investigador Principal en Materiales Nanocelulósicos, Centro de Investigación Técnica VTT, Finlandia

Dra. Tekla Tammelin es licenciada por la Universidad de Tecnología de Helsinki (ahora Universidad de Aalto) en 2006. Trabaja en una red de expertos senior en el área de negocios VTT SONE (Soluciones para Recursos Naturales y Medio Ambiente), teniendo un papel interno como Investigadora Principal con el área de responsabilidad de investigación estratégica "Materiales nanocelulósicos". Las áreas de especialización incluyen el desarrollo de nuevos materiales de base biológica, especialmente los materiales nanocelulósicos y hemicelulosos, así como la formación de estructuras (películas, espumas e telas) e sus aplicaciones, comprendiendo las interdependencias de la estructura funcional y el papel decisivo interfaces.

Actual-mente, promueve e crea conceptos innovadores de biomateriales para futuras soluciones innovadoras. Estos conceptos incluyen estructuras de base biológica como membranas selectivas, materiales con embalaje inteligente e dispositivos electrónicos e materiales energéticos. Es el principal inventora de la reciente patente relacionada con el método de prepa-ración a gran escala para películas de nanocelulosa. Publicó alrededor de 60 artículos revisados por pares y más de 100 procesos de reuniones científicas. Recibió el Premio Nobel de Investigación Nórdica de Akzo en 2010 en el área de la química de superficie de fibras celulósicas y en el año 2016 recibió el Premio VTT de Excelencia Científica Excepcional.

:: ASHOK PATEL

Profesor Asociado en el Instituto de Tecnología de Guangdong Technion de Israel en Shantou, China

Dr. Ashok Patel, autor del libro "Rutas Alternativas a la Estructuración de Petróleo (Springer, 2015)" y editor del libro "Estructuración de Aceite Comestible: Conceptos, Métodos y Aplicaciones (RSC, 2017)", trabaja actualmente como profesor asociado en el Instituto de Tecnología de Guangdong Technion de Israel en Shantou, China.

Se enorgulla de ser un investigador internacionalmente móvil que ha actuado en el área de alimentos coloides en diferentes sectores, incluyendo la industria (Unilever R&D Vlaardingen, Holanda), Universidad (Universidad de Ghent, Bélgica) y organización de investigación (Laboratorio Ibérico Internacional de Nanotecnología, Portugal). Su investigación anterior y actual está enfocada en el uso de ingredientes de grado alimentario para crear nuevos sistemas estructurados (incluyendo oleogénos, espumas, partículas coloidales y emulsiones complejas) para resolver problemas de formulación en el desarrollo de alimentos. Tiene más de 80 publicaciones publicadas (más de 50 como primer autor) en el área de alimentos coloides. Para su investigación ha recibido financiación individual de prestigio y altamente competitiva de la Comisión Europea en tres ocasiones diferentes (Becas de Estudio Internacionales Marie Curie, Becas de Integración de Carrera Marie Curie, Becas de Cofund Fellowship Marie Curie) y otros premios e nominaciones para Joven Científico. En 2015, fue seleccionado, en una oportunidad única, para participar en el encuentro Lindau Nobel Laureate como científico visitante.

:: MARINELLA FARRÉ

Profesora y Responsable del Departamento de Química Medioambiental en IDEAEA-CSIC, España

Dra. Marinella Farré tiene un doctorado en química de la Universidad de Barcelona (diciembre de 2003) e investigadora científica, personal permanente en IDÆA-CSIC desde julio de 2008. Cuenta con más de 150 artículos científicos en revistas de SCI (índice H de 47). , 22 capítulos de libro y ella es co-editora de un libro.

Ella ha supervisado 3 tesis doctorales y actual-mente es supervisora de 4 más en curso. Marinella está involucrada en el estudio de la incidencia y el impacto de los microcon-taminantes orgánicos en el medio ambiente, así como en el desarrollo y aplicaciones de nuevas herramientas biológicas como los biosensores. Participó en más de 30 proyectos de investigación con fondos nacionales y de la UE y fue la coordi-nadora del proyecto Sea-on-a-Chip.

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Oradores Transversales

:: PAULA GALVÃO

Directora de Relaciones Empresariales y Estratégicas, INL

Paula Galvão trabaja en INL desde junio de 2011 y es directora del departamento de Negocios e Relaciones Estratégicas. Tiene una experiencia consolidada en la realización de actividades relacionadas con programas de financiación de IDT, estudios sobre políticas de innovación, desarrollo de estrategias de innovación e prestación de servicios de consultoría relacionados con innovación para empresas y instituciones regionales. A lo largo de los años, ha ganado una experiencia importante en el establecimiento de relaciones comerciales y en el desarrollo de interacciones con instituciones europeas y otras organizaciones de clientes públicas e privadas.

En INL, es responsable de actividades relacionadas con la coordinación de Proyectos Internacionales, exploración de la tecnología, desarrollo de negocios, establecimiento de colaboraciones, incuba-dora del INL e programa de apoyo a las start-up, además de aconsejar a los investigadores sobre esquemas de financiami-ento para la innovación. Inició su carrera en una oficina de transferencia de tecnología de una universidad y, a lo largo de su carrera, ocupó varios cargos senior e de gestión en empresas de consultoría. Paula Galvao tiene un grado en Ingeniería de Materiales por la Universidad de Minho (Portugal).

:: LUÍS MIRA

Presidente de Inovisa y Representante Nacional en el Comité de la CE sobre investigación en agricultura: Agricultural Knowledge and Innvation Systems, Portugal

Luís Mira da Silva es Profesor Asociado en el Instituto Superior de Agronomía de la Universidad de Lisboa. Es Ingeniero Agrónomo por el Instituto Superior de Agronomía, tiene un doctorado en Agricultural Systems por la Universidad de Reading (Reino Unido) y un máster Executive MBA por la Universidad de Londres (Reino Unido). Es Presidente de Inovisa (www.inovisa.pt), miembro del Consejo de Agrinatura (http://agrinatura-eu.eu/), y Representante Nacional en el subgrupo estratégico Agricultural Knowledge and Innovation Systems (AKIS) del Standing Committee on Agricultural Research (SCAR) de la Comisión Europea. También es coordinador de diversos proyectos nacionales e internacionales (en Europa y África) en áreas de innovación, transferencia de tecnología y emprendimiento en la industria agroalimentaria.

:: JUDIT ANDA

Consejera Técnica en la Consejería de Agricultura, Pesca y Desarrollo Rural de la Junta de Andalucía

Ingeniera Agrónoma por la Universidad de Córdoba, Máster en Desarrollo Rural y Gestión de Empresas Agroalimentarias y Máster en Evaluación de Impacto Ambiental. Durante ocho años (2006-2013), ha ocupado puestos de Alto Cargo en la Junta de Andalucía, donde ha podido desarrollar la dirección de políticas públicas relacionadas con el sector agroalimentario, la sanidad animal, sanidad vegetal, la ordenación de sectores agroganaderos, el seguimiento y desarrollo de modelos relacionados con la política agraria comunitaria.

Actualmente es Consejera Técnica en la Consejería de Agricultura, Pesca y Desarrollo Rural de la Junta de Andalucía, donde ejerce la labor de Coordinación de la Estrategia Andaluza de Bioeconomía, responsable de contenidos y estrategias en el Programa de Desarrollo Rural de Andalucía (FEADER), el fomento de la digitalización del sector agroalimentario, incluyendo coordinación del partenariado europeo S3 Agrifood, Trazabilidad y Big Data en la cadena de valor agroalimentaria y la creación del DIH Andalucia Agrotech.

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:: FABIO BOSCARELI

Coordinador S3 AGRI-FOOD HI TECH FARMING, Italia

Fabio Boscaleri es asesor de política en la oficina de enlace de la Región Toscana en Bruselas. Sus principales áreas de competencia son las políticas ambientales, energéticas y agrícolas. Es el coordinador de Bruselas de la Red Informal de las Regiones Europeas para la Innovación en la Agricultura, la Alimentación e los Bosques (ERIAFF).

Con un fuerte interés en proyectos de redes y innovación, promovió la creación de una asociación temática sobre Agricultura de Alta Tecnología bajo la Plataforma S3 AGRIFOOD. Es miembro del Panel de Bioeconomía de las Partes interesadas Europeas para el período 2016-2019 y es socio en dos proyectos activos de CSA H2020: NEFERTITI (Red Europea de Demo Farms) e ROSEWOOD (Red de Regiones Europeas para la Movilización de Madera). En su cargo anterior en el Ministerio de Agricultura de la región de Toscana fue responsable por las biotecnologías verdes e fue miembro de la Comisión Interministerial Italiana para la evaluación de organismos transgénicos.

:: HEINER LINKE

Profesor de NanoFísica, Universidad de Lund, Suecia

Heiner Linke es profesor de Nanofísica en la Universidad de Lund, en Suecia. Entre 1998 y 2001, trabajó como investigador en Sidney/Australia, antes de ingresar al departamento de física de la Universidad de Oregon en 2001, donde recibió un mandato por tiempo indefinido en 2005, e donde permaneció hasta 2009. Desde 2013, es el Director del Centro de Nano-ciencia en la Universidad de Lund (NanoLund), con un ambiente de investigación interdisciplinaria que involucra a unos 300 científicos en tres facultades.

Sus intereses de investigación se concentran en la conversión de energía en nanoescala, incluyendo motores moleculares e termoeléctricos. Fue elegido miembro de la Academia Real de Ciencias de Suecia (clase de física) en 2014.

:: PAULO VILAÇA

Director Operativo en SilicoLife, Portugal

Máster en Bioinformática, concluyó el doctorado en Ciencias de la Computación y tiene más de 8 años de experiencia en funciones de gestión técnica. Tiene una sólida experiencia en el desarrollo de software y ingeniería.
Es responsable por la gestión diaria de un equipo de desarrollo con más de 15 personas que trabajan en biología de sistemas y inteligencia artifi-cial aplicada a problemas de biotecnología industrial.

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:: ANTÓNIO BOB SANTOS

Director de la ANR (Agencia Nacional de Innovación), Portugal

El Doctor António Bob Santos es especialista en Políticas de Innovación y en Innovación Abierta, integrando el Consejo de Administración de la ANI desde julio de 2018, donde inicialmente desempeñó el papel de Asesor para las Políticas de Innovación (2017/2018).
Desde 2001 colabora con diversas estructuras de gobierno en el ámbito de la política de innovación, ha integrado los equipos de diseño, gestión y seguimiento de PROINOV (Programa Integrado de Apoyo a la Innovación), el Plan Tecnológico, la Agenda Digital, la Estrategia de Lisboa, el Plan Nacional de Reformas y del Programa Nacional para el espíritu empresarial y la innovación (+ E + I). El Doctor Antonio Bob Santos fue gestor de proyectos de innovación en la UMIC (Agencia Portuguesa para la Sociedad del Conocimiento), con responsabilidades en la concepción de iniciativas como el NEOTEC, OTIC, Centros de Excelencia de la b-on (Biblioteca del Conocimiento Online), y habiendo colaborado en gestión de proyectos de Smart Cities en CEiiA.

Es doctor en Economía por ISCTE (Instituto Universitario de Lisboa), una institución donde realizó un Master en Ciencias del Trabajo (2002) y se ha licenciado en Economía (1998). Antonio Bob Santos fue también docente invitado en Masters del Instituto Politécnico de Santarém (2008-2012) y del ISCTE-IUL (2017/2018).

:: VICTORIA LEY

Jefe de la División de Coordinación, Evaluación y Seguimiento de la Agencia de Investigación Española

Doctorada en Bioquímica e Biología Molecular por la Universidad Autónoma de Madrid, realizó su tesis doctoral en el Centro de Biología Molecular Severo Ochoa y estancias posdoctorales en el Centro Medico de la Universidad de Nueva York (Nueva York, USA, 1986-1989) y en el Institute Pasteur (Paris, Francia, 1989-1991).

A la vuelta a España se incorporó como Investigadora titular en Instituto Nacional de Investigaciones Agrarias, trabajando en el campo de la virología molecular, respuesta inmune, y detección de virus. Durante el periodo 2003 a 2012 fue la directora de la Agencia Nacional de Evaluación y Prospectiva (ANEP). En 2013, inicia una nueva línea de trabajo en el ámbito de la actividad física y su asociación con enfermedades crónicas. En 2017 se incorpora a la Agencia Estatal de Investigación como responsable de la división de Evaluación, Coordinación y Seguimiento Científico y Técnico. La función fundamental es identificar los mejores proyectos, investigadores, infraestruc-turas y otros recursos, que deban ser financiados por la AEI

:: JESUS ESCUDERO

Relaciones Internacionales INIA (Instituto Nacional de Investigación y Tecnología Agrícola y Alimentaria). PCN español para el H2020 - Societal Challenge 2 Bioeconomía

Licenciado en Biología por la Universidad Complutense de Madrid y doctor (PhD) en Biología Molecular de Plantas por la Universidad de Basilea (Suiza). Inicialmente trabajó en el área de ciencias aplicadas a la agricultura en distintos Centros de investigación, tanto nacionales como extranjeros, así como en el sector biotecnológico industrial (Mogen International - Zeneca Agrochemicals, Syngenta Ltd.).

Ha participado en proyectos científicos de interés, habiendo sido apoyado para su realización por organismos de primera línea en investigación como la European Molecular Biology Organization y la Human Frontier Science Program Organization. Posteriormente realizó funciones de evaluación y gestión técnica de proyectos de I+D+i. En la actualidad desempeña funciones de Relaciones Internacionales en el Instituto Nacional de Investigación y Tecnología Agraria y Alimentaria (INIA), España, siendo Punto Nacional de Contacto para el Reto Social 2 – Bioeconomía dentro del Programa Marco Europeo para la Investigación e Innovación "Horizon 2020".

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:: JOÃO NUNES

Presidente y Director Ejecutivo de Associação BLC3 – Centro de Tecnología e Innovación, Portugal

Formación académica: Doctorado en Biociencias (ecología y cadenas de valor de Biorrefinarias) y maestría y licenciatura pre-Bolonia en Ingeniería Mecánica: Energía y Ambiente.
Experiencia profesional: Actividad docente y pedagógica: de 2016 a 2018, en el curso de Gestan Bioindustrias; de 2007 a 2010, en los cursos de Ingeniería Mecánica e Ingeniería de la FCTUC en las áreas de Residuos Sólidos, Ecología Industrial y Gestión Ambiental y Gestión Energética; de 2011 a 2016 en el Máster Biodiversidad y Biotecnología Vegetal en el área de emprendimiento, y más recientemente en la Licenciatura en Gestión de Bioindustrias, en las áreas de Biorrecursos, Energía y Ambiente, Bioeconomía y Tecnologías de Bioprocesos en el ámbito de la biotecnología industrial; desde 2015, orientador de 6 Tesis de Maestría en el área de las Biorrefinerías, Micología, Evaluación de la calidad de los alimentos, Ciclo de Vida y Sistemas Energéticos y Agroalimentarios; de 2007 a 2010, Co-orientación de proyectos de investigación de los Cursos de Maestría Integrada de Ingeniería de la Universidad de Coimbra (FCTUC): Bio-combustibles de 2ª Generación; Aprovechamiento y gestión de residuos; Evaluación de Ciclo de Vida; Ecología Industrial; y Optimización Tecnológica Integrada.
Actividades y experiencias profesionales: Fundador y Presidente de la Asociación BLC3 - Campus Tecnológico y Fundador y Presidente de Inovação Todo (Inglés para asociación) y el Bio-Economía Economía Circular; miembros del grupo de trabajo y seguimiento de Societal Reto #2: Seguridad Alimentaria, Agricultura y Silvicultura Sostenible, Investigación Marina y Marítima y Aguas Interiores y Bioeconomía; Miembro de la RIS3 - Región Centro (grupo de trabajo de la definición de las estrategias de especialización inteligente); Miembro del Comité Asesor de la Maestría en Innovación en Artes Culinarias de la Escuela Superior de Hostelería y Turismo de Estoril; Miembro de la junta consultiva en Contex a miembro del estado portugués, el proyecto PANTALLA: Economía Circular sinérgico Entre Regiones europeas; Innovación Co-coordinador del programa de I&I para la Economía Circular 2030 FCT; Miembro del equipo de evaluación del Presupuesto Participativo en la zona de Portugal Ciencia.

:: SONIA PAZOS

Negocios y Relaciones Estratégicas, INL

Sonia Pazos ingresó en INL en junio de 2017 como Oficial de Negocios e Relaciones Estratégicas con foco en Asociaciones Público-Privadas de Desarrollo de Negocios y Estrategias. Tiene una maestría en Gestión de Negocios, Inversión e Finanzas y una formación complementaria en Gestión de Innovación, Gestión de Talentos e Gestión de Proyectos (PMO's, metodologías ágiles).

Tiene un conocimiento profundo de las políticas de Innovación e Transferencia de Tecnología, de las metodologías e instrumentos, combinando experiencia sustancial en cargos de gestión en entidades públicas y privadas: Directora de Centros de Tecnología en la GAIN Innovation Agency (Gobierno Regional), Gerente de Innovación en FEUGA - Enterprise-University Foundation, Directora Interina Público-Privado y Consultora durante casi 20 años. En el marco de la estrategia de innovación y transferencia de tecnología, políticas, programas, instrumentos, proyectos multi-actor y alianzas público-privadas, enfocadas principalmente en I + D orientada al sector industrial, innovación orientada al diseño y orientada para el usuario, entrega de innovación e implantación de tecnología.

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:: MARTA CANDEIAS

Punto Nacional de Contacto (NCP) Portugués del FP I+D Horizonte 2020 para la Nanotecnología, Materiales Avanzados y Fabricación

Es el Punto de Contacto Nacional para las Principales Tecnologías Facilitadoras "Nanotecnologías, Materiales Avanzados, Procesos Avanzados y Fabricación" e para el SME Innovation Program, con especial énfasis en el SME Instrument e Fast Track to Innovation.

Marta Candeias tiene un grado en Ingeniería Biológica por la Universidad Técnica de Lisboa (IST) e tiene un máster en la misma area, especializada en disciplinas en el campo de los biomateriales. Actúa como Punto de Contacto Nacional (NCP) para la Investigación y Desarrollo de Programas de Desarrollo Tecnológico de la Unión Europea desde 2009 (FP7 y Horizonte 2020) sobre los temas de las nanociencias, nanotecnologías, materiales avanzados, procesos, fabricación avanzada e SMEs. Entre 2007 e 2009, fue investigadora en el Instituto Superior Técnico e participó en algunos proyectos nacionales y europeos. Desde 2009, ha participado en proyectos para la integración e construcción de la capacitación de las aplicaciones del NCP en los temas que acompañó en el FP7 (PMES Health, TrasnCoSME, NMP TeAm e NMP TeAm 2).

:: TERESA BERNAL

Directora del Departamento de Servicios e Observatorio de Innovación Agencia Gallega de Innovación, Xunta de Galicia

Teresa Bernal Cortegoso es licenciada en Derecho por la Universidad de Coruña. Funcionaria pública en la administración general de la Xunta de Galicia desde 1999, desempeñó inicialmente funciones en el ámbito de las políticas activas de empleo y de análisis del mercado de trabajo e desde 2015 es responsable por el departamento de asesoramiento, apoyo e recaudación de fondos para empresas y empresarios innovadores en la Agencia Gallega de Innovación.

Además, colabora como docente en cursos de postgrado e programas de maestría en el área de empleo y innovación.

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:: INÊS SANTOS SILVA

Asesora a la Oficina de la Secretaría de Estado Portugués de la Industria, Portugal

Inês Santos Silva es asesora de la Oficina de la Secretaría de Estado Portugués de la Industria. Desde 2010, Inês ha sido uno de los miembros más activos en el contexto de nuevas empresas portuguesas (startups), tiendo lanzado una serie de iniciativas para apoyar a los empresarios, nuevas empresas e inversores. Entre los proyectos de que fue co-fundadora estan el Startup Pirates, un programa de pre-aceleración semanal para los aspirantes a empresarios y el PortugalStartups.com, un portal de noticias sobre nuevas empresas portuguesas.

:: JESÚS ALONSO

Secretario General en el Ministério de Ciencia, Tecnología y Innovación del Gobierno Regional de Extremadura

Natural de Cabezuela del Valle, es doctor en Ciencia Biológicas por la Universidad Complutense de Madrid. Es científico titular del CSIC desde 2006, desarrollando su actividad en el Instituto de Ciencia y Tecnología de Alimentos y Nutrición, con una amplia experiencia en la gestión de proyectos de I+D, así como en el campo de la innovación tecnológica en la cadena alimentaria.

Ha sido director general de Innovación y Competitividad Empresarial y posteriormente de director general de Ciencia y Tecnología, participando en la elaboración de la Ley Regional de Ciencia, Tecnología e Innovación, la creación del Centro de Investigaciones Científicas y Tecnológicas de Extremadura (CICYTEX) y del Parque Científico y Tecnológico de Extremadura, así como la gestión de los Planes Regionales de I+D+i y el Programa Regional de Innovación.

:: BEATRIZ ASENSIO

Directora de la Unidad de Programas Europeos en el Instituto para la Competitividad Empresarial de Castilla y León

Beatriz Asensio es licenciada en Ingeniería Química por la Universidad de Valladolid y máster en Ingeniería y Tecnología Ambiental por la Universidad Politécnica de Cataluña. Después de varios puestos relacionados con la investigación, diseño y gestión de plantas energéticas en entidades privadas, desde 2006 trabaja como gestora de proyectos de I + D, promocionando la participación de entidades de Castilla y León en programas de I + D europeos e internacionales y dando soporte directo a empresas de ámbitos sectoriales muy diferentes. Actualmente es la Responsable de la Unidad de Programas Europeos del Instituto para la Competitividad Empresarial de Castilla y León.

:: PEDRO CARNEIRO

Negocios y Relaciones Estratégicas, INL

Pedro Carneiro trabaja en INL desde abril de 2016 como Oficial de Negocios e Relaciones Estratégicas, utilizando su conocimiento en las áreas de la ciencia e la industria para promover y establecer nuevos proyectos nacionales e internacionales para el INL. En el ámbito de la gestión pública de Ciencia e Tecnología, Administrativa, Marketing, Ventas e funciones de Administración General, en empresas locales e multinacionales (Unilever-Jerónimo Martins, ONI Telecom e Grupo Bertrand - los lectores círculo (BertelsmannPublishing)), y el sector público (VP de FCT, la agencia portuguesa para la ciencia e la tecnología de los fondos). Esto le ofreció una amplia experiencia de interacción e negociación tanto con IGO's científicas internacionales como con grupos de trabajo de la Unión Europea.

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Actualmente, colabora con la Universidad Católica Portuguesa, donde es el coordinador del Proyecto de Ciencias Médicas, enseña Estadísticas (pregrado) e Proyectos de Consultoría Estratégica en Gestión (MSc) en la escuela de negocios como profesor visitante. Pedro Carneiro tiene un grado en Economía por la Universidad Católica de Lisboa y un MBA por la la Nova Business School.

:: JOANA BRANCO

Directora de Innovación de Biocant Park, Portugal

PhD en Biomedical Sciences (Baylor College of Medicine - Houston, USA, ICBAS-University of Oporto), y especializada en Entrepreneurship de la Escuela de Negocios de Porto.

Joana la co-fundadora de Gene PreDiT, la biotecnología dedicada dedicada al desarrollo de una nueva terapia para la obesidad. Se ha unido al equipo de biocant Park en 2015, donde las habilidades en el emprendedor, la puesta en marcha, la supervisión y la transferencia, el desarrollo de negocios en los proyectos la ciencia, y la movilización de fondos se convierte en activos. Basada en la experiencia, es frecuentemente un speaker y mentor en programas para apoyar el desarrollo de las ideas y la promoción del espíritu empresarial. Se trata actualmente de un Director de Innovación en Biocant Park donde se dedica a promover la innovación en biotecnología e internationalización del sector.

:: SOUMODIP SARKAR

Presidente Ejecutivo del "PACT - Parque de Ciencia y Tecnología del Alentejo", Portugal Miembro del Asia Center de la Universidad de Harvard Profesor y vicerrector de innovación, la cooperación y el espíritu empresarial en la Universidad de Évora, Portugal

Soumodip Sarkar es profesor en el Departamento de Gestión de la Universidad de Évora, Portugal, y investigador en CEFAGE-UE. Actualmente, es también Asociado (socio no residente) del Centro de Asia en la Universidad de Harvard. Es también vicerrector de la Universidad de Évora, así como Presidente Ejecutivo del Science Park of the region (PACT). Es el Presidente del Comité de Evaluación Externa del Equipo de Evaluación de las Universidades Portuguesas (A3ES) en el ámbito de la gestión en Portugal. Internacionalmente, forma parte del equipo de acreditación de CEEMAN.

Sus actuales intereses de investigación incluyen innovación, emprendimiento e sostenibilidad. Su más reciente investigación se publicó en periódicos de renombre tales como: Scientometrics, Journal of Business Venturing, Journal of Small Business Management, European Management Journal, Entrepreneurship & Regional Development, Technology Forecasting and Social Change, Journal of Business Research, Service Business, Sustainability, Journal of Cleaner Production, Journal of Knowledge Economy, European Journal of Innovation Management, Service Industries Journal, Trends in Food Science and Technology, Regional Science and Urban Economics, Energy Journal, entre otros. Publicó cuatro libros sobre emprendedorismo y innovación, e su libro más reciente, "EntreSutra", fue publicado por Bloomsbury en mayo de 2018. Además, ha sido coordinador e miembro del equipo de dieciséis proyectos internacionales (financiados por la UE) así como proyectos regionales. Actualmente, está involucrado en nueve proyectos diferentes. P

rofesor Sarkar ha dado un gran número de conferencias internacionales y es un speaker muy procurado para hablar sobre la relevancia del emprendedorismo e la innovación en la sociedad. Como prueba de eso, ha merecido destaque en los medios nacionales e internacionales, incluyendo el Economist e la BBC. En 2008, fue reconocido como uno de los 100 mejores expertos en innovación (WEF-McKinsey).

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BRAGA

Braga es una ciudad animada, una de las más antiguas de Portugal, y está llena de jóvenes que estudian en su Universidad.

Construida hace más de 2.000 años, "Bracara Augusta" fue fundada por el emperador romano Augusto. Estaba ubicada en una de las principales vías romanas de la Península Ibérica, era la sede administrativa del Imperio, y más tarde se le otorgó el estatuto de capital de la provincia romana de Gallaecia, actual Galicia, por el emperador Caracalla. La diócesis de Braga es la más antigua de Portugal y, en la Edad Media, la ciudad incluso compitió con Santiago de Compostela en poder e importancia. Uno de los "Caminos de Santiago" pasó por aquí cuando este culto de peregrinación creció después de la reconquista cristiana y la fundación de Portugal.

La **catedral de Braga** también es la más antigua del país y fue construida en el siglo XII por los padres del primer rey de Portugal, D. Henrique y D. Teresa, que están enterrados allí. Braga es hoy en día uno de los principales centros religiosos del país, teniendo las celebraciones de la Semana Santa y el festival de São João como lo más destacado en su calendario litúrgico y turístico.
Además del Tesouro-Museu da Sé (Museo del Tesoro de la Catedral), vale la pena visitar el Museo Biscainhos, ubicado en un palacio barroco, un período histórico en la historia de Braga, y el Museo Arqueológico D. Diogo de Sousa, ya que la ciudad también abunda en restos de la época romana. Sugerimos un paseo tranquilo por el centro histórico para visitar algunas de sus numerosas iglesias, admirar las casas y edificios históricos, como el Palácio do Raio, el Theatro Circo o el Arco da Porta Nova, y tomar un café en la emblemática Brasileira con un vista de la concurrida Avenida Central. Pero Braga también es considerada la ciudad más joven de Portugal y, desde sus puntos de referencia contemporáneos, se destaca el Estadio Municipal de Braga, diseñado por Souto Moura, uno de los arquitectos portugueses más prestigiosos y ganador del Premio Pritzker.

Theatro Circo fue promovido en 1906 por un grupo de personas de Braga, dirigido por Artur José Soares, José António Veloso y Cândido Martins. Hasta esa fecha, la ciudad solo tenía el pequeño Teatro São Geraldo. En 1911, el proyecto comenzó a tomar forma por la mano del arquitecto João de Moura Coutinho y el 21 de abril de 1915 se inauguró Theatro Circo, coincidiendo con un período de gran desarrollo económico y social en Braga. A lo largo de las décadas, el espacio sufrió profundos trabajos de rehabilitación, destinados a la conversión de Theatro Circo en un gran complejo cultural, equipado con la tecnología escénica y sonora más actualizada y completa, capaz de satisfacer las necesidades del arte contemporáneo en sus muchas dimensiones.

Praça da República
Más info: https://visitbraga.travel/braga

Catedral da Sé de Braga
Más info: braga.360portugal.com

Theatro Circo
Más info: www.theatrocirco.com/en

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Bom Jesus de Braga
Más info: www.youtube.com (Aerial view in 4k)
https://bragacool.com/visitar/bom-jesus-monte
https://www.travelingwithaga.com/how-to-visit-bom-jesus

Aquí puedes descargar una tour guide con más información sobre Braga:
https://visitbraga.travel/pub/media/guia/roteiro_braga.pdf

Todos los visitantes de Braga deben ir al **Santuario de Bom Jesus,** un cono de la ciudad, con su monumental escalera, declarado Patrimonio de la Humanidad por la UNESCO en 2019. En medio de una extensión de vegetación, ofrece una excelente vista panorámica de la ciudad, al igual que otras dos iglesias cercanas: el Santuario Nossa Senhora do Sameiro, un importante lugar de culto mariano, y la Iglesia de Santa Maria da Falperra. Bom Jesus es considerado uno de los santuarios más bellos de Portugal y es una referencia del arte barroco en el Pais, con una historia que se remonta al siglo XIV.

Para llegar allí, se puede subir la famosa escalera a la iglesia neoclásica, con 581 escalones, rodeada de magníficos jardines y hoteles. Alternativamente, se puede usar el ascensor que lleva a la parte superior de la escalera. Este ascensor, que funciona desde 1882, es único en la Península Ibérica y el más antiguo del mundo que sigue activo. El elevador se mueve por contrapeso de agua, con dos cabinas, que están conectadas por un cable. La forma original en que funciona este elevador lo convierte en una de las piezas de ingeniería más extraordinarias de Portugal.

Además, también es posible llevar el automóvil arriba y hacer un picnic en los magníficos jardines de Bom Jesus y así disfrutar del aire fresco de la naturaleza y de los impresionantes paisajes. La puesta de sol vista desde aquí le da un sentido completamente nuevo al concepto de "hora dorada".

En los últimos años, la Universidad de Minho y la calidad de la arquitectura contemporánea han inculcado una atmósfera de vitalidad juvenil que ha llevado a esta antigua ciudad a un nivel inesperado de modernidad.

Todos estos atributos fueron primordiales para que Braga fuera considerado el **Segundo Mejor Destino de Europa en 2019** en el concurso promovido por "**European Best Destinations**".

Jardim de Santa Bárbara
Más info: braga.360portugal.com

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Partner principal:

BRAGA Município

Organizador:

INL INTERNATIONAL IBERIAN NANOTECHNOLOGY LABORATORY

Partners regionales Interreg-POCTEP:

CCDR Algarve

Agencia de Innovación y Desarrollo de Andalucía IDEA
CONSEJERÍA DE ECONOMÍA, INNOVACIÓN, CIENCIA Y EMPLEO

CCDR ALENTEJO

FUNDECYT PCTEX un espacio para innovar

ccdrc comissão de coordenação e desenvolvimento regional do centro

competitividad empresarial ice

Junta de Castilla y León

CCDRN Comissão de Coordenação e Desenvolvimento Regional do Norte

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NANOTECHNOLOGY: An enabler for the BIOECONOMY

nanoGateway International Conference | October 17th, 2018 | Altice FORUM, Braga (Portugal)

SCIENTIFIC PROGRAMME

CROSS-CUTTING PROGRAMME

9h00 Registration | Registration

9h30

OPENING

Manuel Heitor, Minister of Science, Technology and Higher Education
Lars Montelius, Director-General INL
Cross-Border Regions Representatives

PLENARY SESSION

10h00

KEY ENABLING TECHNOLOGIES (KET) FOR BIOECONOMY

"Key Enabling Technologies for the future bioeconomy"

Prof. Orlando J. Rojas, **Editor-in-Chief Journal of Dispersion Science and Technology.**
Chair Aalto's Materials Platform. Professor of Department of Bioproducts and Biosystems, Bio-based Colloids and Materials (BiCMat) group, in School of Chemical Engineering, Aalto University, Finland. Principal Investigator of Finland´s Centre of Excellence in "Molecular Engineering of Bio-synthetic Hybrid Materials" (HYBER).

10h45 Coffee break | Coffee break

SCIENTIFIC SESSION 1

11h00

Session 1
AGRO/FORESTRY MISSION: Growing our common future

"Bioinspired membranes and filters from cellulose nanofibrils"

Tekla Tammelin
Principal Scientist in Fibres and Biobased Materials Research area and Docent in Bioproduct Technology, Aalto University
Principal Investigator in Nanocellulosic Materials, VTT Technical Research Centre of Finland

11h30 - 12h30 | Oral Presentations.
Chair: **Tekla Tammelin**

Oleogels based on vegetable oil and epoxidized cellulose paste.
Esperanza Cortés-Triviño, Pro2TecS- Center for Research in Product Technology and Chemical Processes. University of Huelva, Spain.

Hybrid magnetic nanostructured agents for environmental remediation.
Yolanda Piñeiro, Department of Applied Physics. University of Santiago de Compostela, Spain.

DNA biosensor to detect invasive species in water sources.
Joana Guerreiro, International Iberian Nanotechnology Laboratory. Portugal.

CROSS-CUTTING SESSION 1

Corss-Cutting Session 1
BUILDING THE BIOECONOMY

"Innovation hubs and platforms to foster the market uptake of KETs and interregional cooperation"

Chair: **Sonia Pazos**
Business and Strategic Relations , INL

Heiner Linke
Professor of Nanophysics and Director of NanoLund Center for Nanoscience. Lund University, Sweden

Judit Anda
Coordinator S3 Traceability and Big Data in Agri-food Value Chain and Coordinator of DIH Andalucía AgroTech. Junta de Andalucía, Spain

Fabio Boscareli
Coordinator S3 Agri-Food Hi Tech Farming, Italy

Luis Mira
President at Inovisa and Associate Professor Superior Agronomy Institute at University of Lisboa. National Representative of Agricultural Knowledge and Innovation Systems on Agricultural Research at the EC. Portugal

Paula Galvão
Business and Strategic Relations Chief Officer, INL

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NANOTECHNOLOGY: An enabler for the BIOECONOMY

nanoGateway International Conference | October 17th, 2018 | Altice FORUM, Braga (Portugal)

SCIENTIFIC PROGRAMME

12h30 Lunch

SCIENTIFIC SESSION 2

13h30 - 14h30 Poster Exhibition

Session 2
FOOD INDUSTRY MISSION: Nourishing our common future

14h30 - 15h00 *"Are edible oleocolloids the final frontier in food innovation?"*

Ashok R. Patel
(Ph.D.) MRSC, Guangdong Technion Israel Institute of Technology.
Associate Professor, Biotechnology & Food Engineering in Guangdong Technion Israel Institute of Technology.

15h00 - 16h00 | Oral Presentations | Chair: **Ashok. R. Patel**

Mentha pulegium-nanofitossomas: desenvolvimento de nutracêuticos com atividade neuromoduladora.
João Bernardo, REQUIMTE/LAQV, Group of Pharmaceutical Technology, Faculty of Pharmacy. University of Porto and Coimbra, Portugal.

Fabrication of highly monodisperse bacteriophage-loaded microstructures in droplet microfluidics.
Luís Passos, International Iberian Nanotechnology Laboratory; University of Minho. Portugal.

Development of nanostructured lipid carriers based on oleogel using rhamnolipids as surfactant.
Alexandra Azevedo, International Iberian Nanotechnology Laboratory; Centre of Biological Engineering, University of Minho. Portugal.

Oleogels for the development of healthier meat-based food products.
Artur Martins, Centre of Biological Engineering, University of Minho. Portugal.

16h00 - 16h30 Networking-Coffee Break

CROSS-CUTTING PROGRAMME

Lunch

CROSS-CUTTING SESSION 2

13h30 - 15h00

POWERING BIOECONOMY THROUGH TALENT, RESEARCH AND INNOVATION

"Talent, research and innovation for bioeconomy"

João Nunes
President and CEO of BLC3 Association –Centre of Technology and Innovation, Portugal

Paulo Vilaça
Chief Operations Officer at SilicoLife, Portugal

Joana Branco
Innovation Director | Biocant Inovação

14h00 - 15h00 *"Funding opportunities for research, innovation and bioeconomy"*
Chair: **Pedro Carneiro**
Business and Strategic Relations , INL

António Bob
Administrator of ANI (National Innovation Agency) of Portugal

Victoria Ley
Head of the Division of Coordination, Evaluation and Follow up at the Spanish Research Agency

Jesus Escudero
International Relations INIA (National Institute for Agricultural and Food Research and Technology). Spanish NCP for H2020 – Societal Challenge 2 Bioeconomy

Marta Candeias
Portuguese NCP of FP R&D H2020 for Nanotechnology, Advanced Materials and Manufacturing

15h00 - 16h00 **SIDE ACTIVITIES**

"Nanoris3 working group meeting"
"Startups demoday"
"Exhibition area"

16h00 - 17h00 Networking-Coffee Break

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NANOTECHNOLOGY: An enabler for the BIOECONOMY

nanoGateway International Conference | October 17th, 2018 | Altice FORUM, Braga (Portugal)

SCIENTIFIC PROGRAMME

SCIENTIFIC SESSION 3

16h30 Session 3

WATER & AQUACULTURE MISSION: Irrigating our common future

16h30 - 17h00 *"Developments of autonomous biosensors for seawater monitoring"*

Marinella Farré
IDAEA-CSIC. Barcelona, Spain
Research Scientist at IDEAEA-CSIC, Spain.

17h00h - 18h00 | Oral Presentations.
Chair: **Marinella Farré**

Covalent Organic Frameworks for in situ adsorption of okadaic acid.
Soraia Fernandes, International Iberian Nanotechnology Laboratory. Portugal.

Development of an electrochemical sensor based on MIP-QDs for assessing cocaine and metabolites.
Raquel Queirós, International Iberian Nanotechnology Laboratory; University of Santiago de Compostela. Spain-Portugal.

Magnetic covalent organic framework for the adsorption of marine phycotoxins.
Vanesa Romero, International Iberian Nanotechnology Laboratory. Portugal.

Nanotechnology to address the problem of water resources contamination by heavy metals: A roadmap.
Edgar E. Gonzalez, Geophysical Institute, Faculty of Engineering. Pontifical University Javeriana, Colombia.

CROSS-CUTTING PROGRAMME

CROSS-CUTTING SESSION 3

17h00 - 18h30

CONNECTING STARTUP ECOSYSTEMS

"Financing models and partnerships for startups"
Chair: **Alexandre Mendes**
Executive Director of Startup Braga

Inês Santos
State Secretary Cabinet of Industry, Government of Portugal

Jesús Alonso
Secretary-General of Science, Technology and Innovation. Junta de Extremadura, Spain

Beatriz Asensio
Head of the European Programmes Unit at the Institute for Business Competitiveness of Castilla y León, Spain

Soumodip Sarkar
Executive President of "PACT - Science and Technology Park of Alentejo". Fellow at the Asia Center, Harvard University. Full Professor and Vice-Rector for Innovation, Cooperation & Entrepreneurship at University of Évora. Portugal

Teresa Bernal
Director of the Innovation Observatory Dept. Galician Innovation Agency (GAIN). Spain

18h30

CONFERENCE CLOSING
Lars Montelius, Director-General INL, Portugal.
Ana Teresa Lehmann, Secretary of State of Industry, Government of Portugal.

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Contributed Talks
Apresentações Orais
Presentaciones Orales
- ABSTRACTS -

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Oleogeles basados en aceite vegetal y pasta de celulosa epoxidada

Author(s): Esperanza, Cortés-Triviño; Concepción, Valencia; José María, Franco.
Affiliation: Pro2TecS- Centro de Investigación en Tecnología de Productos y Procesos Químicos, Universidad de Huelva, 21071 Huelva, España
Title: Oleogeles basados en aceite vegetal y pasta de celulosa epoxidada
Main domain: Agriculture
Presentation type: Oral communication
Keywords: Oleogeles, celulosa, lubricantes

Plain abstract summary

Actualmente, la preocupación por la contaminación ambiental está provocando que la industria de los lubricantes intente reemplazar los productos derivados del petróleo por otros más beneficiosos con el medio ambiente, como aceites vegetales y espesantes procedentes de recursos renovables. En este trabajo se ha estudiado el uso de diversos epóxidos para modificar químicamente una pasta de celulosa, usándola como espesante de aceite de ricino. Los oleogeles resultantes podrían ser propuestos como alternativas a grasas lubricantes tradicionales. En primer lugar, se analizó la influencia del índice de epóxido del espesante en las propiedades reológicas de los geles modificando la cantidad de neopentil glicol diglicidil eter. Además, se estudió la influencia de la modificación de la estructura química del epóxido en las propiedades del oleogel resultante.

This work is part of two research projects (CTQ2014-56038-C3-1R and TEP-1499) sponsored by MINECO-FEDER and Junta de Andalucía programmes, respectively.

Mentha pulegium-nanofitossomas: desenvolvimento de nutracêuticos com atividade neuromoduladora

João Bernardo[1], Romeu A. Videira[1], Rafael Vilamarim[1], Patrícia Valentão[1], Francisco Veiga[2,3], Paula B. Andrade[1]
[1]REQUIMTE/LAQV, Laboratório de Farmacognosia, Departamento de Química, Faculdade de Farmácia, Universidade do Porto, Portugal. [2]REQUIMTE/LAQV, Group of Pharmaceutical Technology, Faculty of Pharmacy, University of Coimbra, Coimbra, Portugal. [3]Department of Pharmaceutical Technology, Faculty of Pharmacy, University of Coimbra, Pólo das Ciências da Saúde, Azinhaga de Santa Comba 3000-548 Coimbra, Portugal.

Title: *Mentha pulegium*-nanofitossomas: desenvolvimento de nutracêuticos com atividade neuromoduladora
Main domain: Food Industry
Presentation type: Oral communication
Keywords: Nanofitossomas, neuromodulação, nutracêutico

Plain abstract summary

A monoamina oxidase-A (MAO-A é um alvo terapêutico para doenças associadas à desregulação crónica da atividade neuronal [1]. Os polifenóis da *Mentha pulegium* L. modulam a atividade desta enzima, mas apresentam reduzida biodisponibilidade. Para ultrapassar este problema, o extrato lipídico de ovos de galinha e o extrato aquoso de *M. pulegium* foram usados para preparar nanofitossomas funcionais. O extrato lipídico é uma mistura rica em fosfatidilcolina e fosfatidiletanolamina, contendo 7,5% de colesterol e quantidades vestigiais de carotenoides. O ácido rosmarínico é o composto maioritário do extrato aquoso de *M. pulegium*. Estudos com células SH-SY5Y revelaram que concentrações não tóxicas de nanofitossomas (diâmetro <200 nm; potencial Zeta=

−15,84±2,32 mV) são efetivas na inibição da MAO-A (48,24±9,02%), sugerindo o potencial nutracêutico desta formulação.

UID/QUI/50006/2013; NORTE-01-0145-FEDER-000024; 0377_IBERPHENOL_6_E; SFRH/BD/129499/201.

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Preparation and Characterization of Electrospun Films of Poly (3-hydroxybutyrate-co-3-hydroxyvalerate) Derived From Fruit Pulp Biowaste for Food Biopackaging

B. Melendez-Rodriguez[1], J.L. Castro-Mayorga[1], M.A.M. Reis[2], C. Sammon[3], L. Cabedo[4], S. Torres-Giner[1] and J.M. Lagaron[1*]

[1] Novel Materials and Nanotechnology Group, Institute of Agrochemistry and Food Technology (IATA), Spanish Council for Scientific Research (CSIC), Paterna, Spain,

[2]UCIBIO-REQUIMTE, Chemistry Department, Faculty of Sciences and Technology, Universidade NOVA de Lisboa, Caparica, Portugal,

[3] Materials and Engineering Research Institute, Sheffield Hallam University, Sheffield, United Kingdom,

[4] Polymers and Advanced Materials Group, Universitat Jaume I, Castellón, Spain

(*) Jose M. Lagaron,

Abstract– Industrial by-product residues management is the main goal to maintain resource conservation and the quality of the environment. The growing concern for plastic waste disposal of petroleum-based materials has intensified the study and development of bio-based and biodegradable polymers,

particularly those synthesized from agro-industrial residues [1]. Recently, biopolymers are used to replace petroleum-based synthetic polymers to reduce the non-renewable energy consumption and the carbon dioxide emission [2]. This work reports different methods to purify, namely non-extraction, extraction with sodium hypochlorite (NaClO) (sample 1), and extraction with chloroform (sample 2) of a circular economy based and potentially low-cost poly(3-hydroxybutyrate-co-3-hydroxyvalerate) (PHBV) produced by mixed microbial cultures derived from fruit pulp, an industrial by-product of the juice industry. The highest yield obtained was 40% with sample 2 and it was the most optimal solution for its processing via electrospinning. After thermal post-processed of the resultant ultrathin fiber mats, in order to obtain continuous films adequate for food packaging applications, the films were characterized in terms of morphology, crystallinity as well as thermal, mechanical, and barrier properties. Different results in their characteristics were found depending on the purification applied. The results showed that sample 2 presented the highest degree of purity, resulting in more transparent films with lower wettability and higher flexibility. Therefore, there are a great potential as interlayers or coatings for food biopackaging applications for these electrospun films made of biomass derived from biowaste [3].

Acknowledgement- The authors would like to thank the Unidad Asociada IATA-UJI Plastics Technology and the Spanish Ministry of Economy and Competitiveness (MINECO) project AGL2015-63855-C2-1-R and the H2020 EU projects YPACK (reference number 773872) and RES URBIS (reference number 730349) for funding. BM-R and ST-G would also like to thank the MINECO's FPI (BES-2016-077972) and Juan de la Cierva (IJCI-2016-29675) programs, respectively.

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3. Melendez-Rodriguez, B., et al., *Preparation and Characterization of Electrospun Food Biopackaging Films of Poly(3-hydroxybutyrate-co-3-hydroxyvalerate) Derived From Fruit Pulp Biowaste.* Frontiers in Sustainable Food Systems, **2**(38), 2018.

Oleogels for the development of healthier meat-based food products

Authors: Artur J. Martins[a,b*], Lorenzo, J.M.[c], Franco, D.[c], António A. Vicente[a], Rosiane L. Cunha[d], Lorenzo M. Pastrana[b], and Miguel A. Cerqueira[b]

Affiliation:

a - Centre of Biological Engineering, University of Minho, Campus de Gualtar, 4710-057 Braga, Portugal.

b - International Iberian Nanotechnology Laboratory, Av. Mestre José Veiga s/n, 4715-330 Braga, Portugal

c- Centro Tecnológico de la Carne de Galicia, rúa Galicia n° 4, Parque Tecnológico de Galicia, San Cibrao das Viñas, 32900 Ourense, Spain

d - Department of Food Engineering, Faculty of Food Engineering, University of Campinas, UNICAMP, CEP: 13083-862, Campinas, SP, Brazil

Main domain: Food Industry

Presentation type: Oral communication

Keywords: oleogel; functional food; linseed oil; organogel.

Plain abstract summary (narrative text maximum 350words

Obesity is a disease that can be addressed through preemptive actions and behavioral changes like proper diet and exercise. In connection with obesity, cardiovascular disease can become an additional and severe problem. Scientific data regarding western diets, recons that dietary lipids account for over 35% of the daily caloric content of an individual's diet. Because of this it would be valuable to have alternatives with anti-obesogenic effects [1]. Another significant dietary factor in the prevention of obesity is a balanced omega-6/omega-3 ratio intake, that can be achieved through the consumption of enriched foods. Food innovation is driven by food products that contribute to improve health. These products are known as functional foods and they can be used strategically in order to avoid or battle the above-mentioned disorders.

Functional oleogels were produced using enriched alpha-linolenic linseed oil with plant sterols (in hamburger production) and beeswax (in pate production) as oil gelators. Oleogels with 8 % (w/w) of gelator were used in both products as replaces of saturated fat. The range of fat replacement went from 25 to 75 % in hamburgers (H-25 and H-75) and 30 to 60 % in pate (P-30 and P-60). Tests with hamburgers showed that consumer

acceptance and preference was directed towards the control samples. Nevertheless, the hamburgers samples with less amount of oleogel (H-25) were classified positively in both the acceptance and preference tests. Those same two sets of samples (control an H-25) showed similar textural characteristics. In the pate sensorial tests, the control sample was the much-liked one, however after data observation, the overall score for the P-30 sample still remains positively interesting and not that far from the control. Also, significant differences were recorded for the preference tests between the control samples and the samples with oleogels. After oleogel incorporation both products revealed an increased polyunsaturated fatty acid (PUFAs) content, followed by an increase of the omega-6/omega-3 ratio that can result in a possible high omega-3 bioavailability through digestion, possibly leading to an anti-obesity effect.

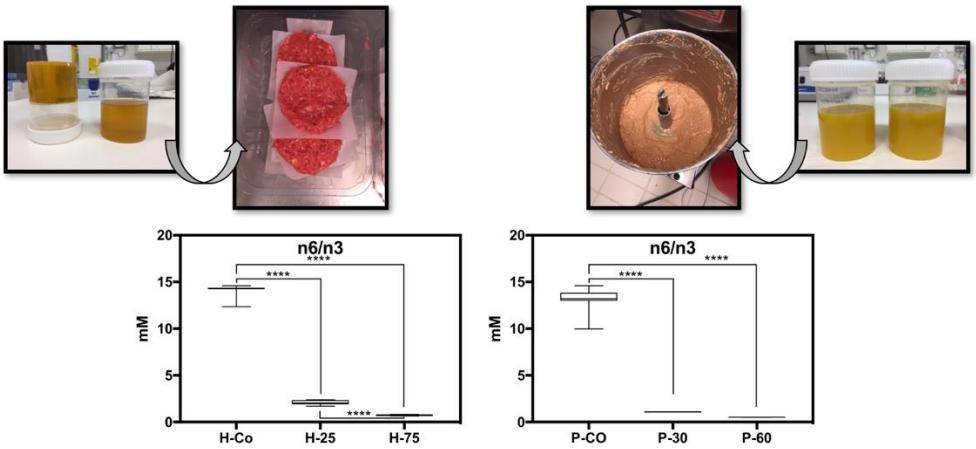

Fig. 1. Illustration of both products and omega-6/omega-3 ratio profile.

The authors acknowledge the Project RECI/BBB-EBI/0179/2012 (FCOMP-01-0124-FEDER-027462). Artur Martins is recipient of a fellowship supported by a doctoral advanced training (call NORTE-69-2015-15) funded by the European Social Fund under the scope of Norte2020 - Programa Operacional Regional do Norte. José M. Lorenzo, is a member of the MARCARNE network, funded by CYTED (ref. 116RT0503).

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Fabrication of highly monodisperse bacteriophage-loaded microstructures in droplet microfluidics

Authors: **L. Passos** [1,2], S. Abalde-Cela [1], P. Fuciños, L. Diéguez [1], L.M. Pastrana [1], M.A. Cerqueira [1], S. Sillankorva [2]

[1] *International Iberian Nanotechnology Laboratory (INL), Avda Mestre José Veiga, 4715-310 Braga, Portugal*

[2] *Centre of Biological Engineering (CEB), University of Minho, R. da Universidade, 4710-057 Braga, Portugal*

Title: Development of bacteriophage-loaded microstructures using microfluidics

Main domain: Food Industry

Presentation type: Oral communication preferred.

Keywords: Microfluidics, Encapsulation, Bacteriophages

Today, there is a growing demand for fresh-cut fruits and vegetables which need to be handled under controlled conditions to guarantee the safety of these products [1]. However, unhygienic practices during preparation occasionally occur and may lead to risks to public health through foodborne illnesses [2]. The use of bacteriophages, viruses infecting bacteria, emerges as a possible solution, decreasing the microbial contamination in food products [3] [4]. Finding strategies for their safe addition to food products is a challenge. The actual encapsulation methods are expensive, non-automated and poorly reproducible however these disadvantages can be tackled by microencapsulation. In this work we have developed a method to produce homogenous agarose beads (≈120 µm loaded with bacteriophages by using microdroplet-based encapsulation [5]. This cost-effective and automated method improves the reproducibility and monodispersity of bacteriophage-loaded microcapsules for their use in food safety control.

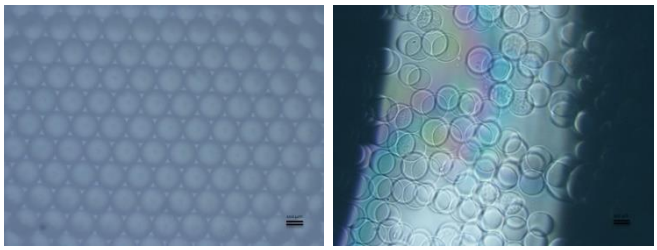

Figure 1. a) Agarose beads dispersed in oil; b) Dark Field image of agarose beads, in water phase.

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Covalent Organic Frameworks for *in situ* adsorption of okadaic acid

Soraia P. S. Fernandes, Laura M. Salonen, Begoña Espiña

INL – International Iberian Nanotechnology Laboratory

Main domain: Water Resources

Keywords: Solid-Phase Adsorption Toxin Tracking, Diarrhetic shellfish poisoning toxins, Two-dimensional Covalent Organic Frameworks

The occurrence of contaminants in water emerge as a worldwide problem in the field of water quality monitoring. Thus, the development of efficient monitoring techniques is needed to improve human safety and overcome the economic losses.[1] Diarrhetic shellfish poisoning (DSP) toxins, such as okadaic acid (OA), produced by marine microalgae during harmful algal blooms (HABs) can concentrate on the digestive gland of seafood, compromising human health and the seafood aquaculture industry. Solid-phase adsorption toxin tracking (SPATT) is a passive *in situ* methodology for the pre-concentration of biotoxins, consisting of batches of adsorbent resins within a mesh, installed in a frame at different locations and depths.[2] So far, two-dimensional covalent organic frameworks (COFs), which are crystalline nanoporous materials formed by the self-assembly of purely organic building blocks into sheets, appear as promising adsorbents materials.[3] Previously, we reported that water-stable COF derivative TpBD-Me_2 adsorbs okadaic acid from seawater 30 times more efficiently than the most commonly used polystyrene resin HP-20.[4]
Herein, we will present our SPATT systems based on the incorporation of TpBD-Me_2 COF for the monitoring of okadaic acid toxin in seawater. COF-based SPATTs were used to track okadaic acid in a mussel production aquaculture plant during 2017.

Acknowledgments: *This work was partially funded by the project Nanotechnology Based Functional Solutions (NORTE-01-0145-FEDER-000019), supported by Norte Portugal Regional Operational Programme (NORTE2020) under the PORTUGAL 2020 Partnership Agreement through the European Regional Development Fund (ERDF) and ERDF-Innterconecta Mytitox.*

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DNA biosensor to detect invasive species in water sources

Authors: J.Rafaela Guerreiro[1],Monisha Elumalai[1], Joana Carvalho[1], Andrey Ipatov[1], Marta Prado[1]
Affiliation name
[1]International Iberian Nanotechnology Laboratory, Department of Life Sciences, Nano4Food Unit, Food Quality & Safety Research Group, Braga, Portugal

Title DNA biosensor to detect invasive species in water sources

Main domain: Water Resources
Presentation type: Oral communication
Keywords: DNA detection, plasmonics, biosensors

Plain abstract summary

The ongoing spread of aquatic invasive species such as Zebra Mussels - *Dreissena Polymorpha* has caused massive damage in the environment as well as in the economy[1]. The rapid spread of invasive species is threatening the fresh water supplies and causing negative impacts in the ecosystems of fresh water lakes and river basins. Increasing efforts have been made to stop this invasion however the current methods are still not effective. Therefore, there is a need for early detection methods. DNA based sensors are alternative powerful tools useful in early stage detection. Here we propose a colorimetric and an optical biosensor for the detection and monitoring of environmental DNA (eDNA) as an ecosystem protective measure. The detection strategy is based on the hybridization between the eDNA target and the complementary DNA sequence (probe). In the colorimetric approach, the probe immobilized on nanospheres (AuNS), hybridizes with the target DNA forcing the particles to get in closer contact, which results in a colour change observed by naked eye. Whereas in the optical plasmonic biosensor, probes are immobilized on gold nanorods (AuNR), attached to a silica surface and hybridization is monitored with a spectrophotometer.
Both gold nanoparticles were synthesized and tuned to the wavelength of interest[2]. Gold nanoparticles were synthesized, characterized by UV-visible spectrophotometry and transmission electron microscopy. The obtained AuNS and AuNR present a maximum

LSPR peak position of 519 and 660 nm while the size was 17nm diameter and width/length of 17.7/42.3 nm, respectively.
For the colorimetric strategy, DNA probes were loaded on AuNS by pH assisted method. The AuNS/DNA were then incubated with increasing target concentrations to study hybridization efficiency. For the plasmonic sensor, a home-made flow cell was used to inject the probe and loading the DNA on AuNR surface. The immobilized probe induced a red shift of ~6 nm indicating a local refractive index increase. Upon target addition, an extra red shift is obtained triggered by the hybridization events.
A portable platform with DNA amplification will then be integrated with the biosensors to be used in the field and can be exploited for further environmental control applications.

Acknowledgements: This work was supported by project Nanotechnology Based Functional Solutions (NORTE-01-0145-FEDER-000019), supported by Norte Portugal Regional Operational Programme (NORTE2020), under the PORTUGAL 2020 Partnership Agreement, through the European Regional Development Fund, and by the partnership agreement project between the Confederación Hidrográfica del Guadalquivir and the International Iberian Nanotechnology Laboratory for the development of a system of early detection of the zebra mussel through analysis of environmental DNA.

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Nanotechnology to address the problem of water resources contamination by heavy metals: A roadmap

Edgar E González
Nelson Obregón
Geophysical Institute, Faculty of Engineering, Pontificia Universidad Javeriana

Abstract
The contamination of water resources by heavy metals and their implications for the environment and food safety, is positioned as one of the problems of greatest impact for the society that transits the first half of the XXI century. The present work, in addition to presenting achievements and advances that we have obtained in the development of strategies for monitoring, mitigation and remediation of water contaminated by heavy metals [1-2], from the nanotechnology, a roadmap to address this problema is proposed.

With the design and manufacture of portable and low-cost nanosensors -specifically microfluidic paper sensors-, the implementation of autonomous sensor networks and community, academic and institutional participation, it is possible to perform a concerted mapping at regional and local levels of presence and concentration of heavy metals in contaminated water as well as risk maps for the exposed population. This diagnosis makes it possible to trace the mitigation and remediation programs and policies, as well as studies and evaluation of causes and mobility using the advantages offered by bio and nanotechnology for this purpose [3-4]. A fundamental aspect that is taken into account is the life cycle and its impact on the environment and living beings of nanomaterials and other precursors used for sensing and remediation. The production of nanomaterials for removal of heavy metals from water is done by environmentally friendly methods.

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Hybrid magnetic nanostructured agents for environmental remediation

Author(s): Y. Piñeiro1; S. Yáñez1; L. de Castro1, M. González1; Z. Vargas1; Jesús M. González-Jartín2, Inés Rodríguez2, Amparo Alfonso2, M. J. Sainz3, L. Botana2, J.Rivas1.

Affiliation: 1 Departamento de Física Aplicada, Universidad de Santiago de Compostela, Facultad de Física, 15782, Santiago de Compostela, Spain.
2 Departamento de Farmacología, Universidad de Santiago de Compostela, Facultad de Veterinaria, 27002, Lugo, Spain.
3 Departamento de Producción Vegetal, Universidad de Santiago de Compostela, Facultad de Veterinaria, 27002, Lugo, Spain.

Title: Hybrid magnetic nanostructured agents for environmental remediation

Main domain: Water Resources
Presentation type: Oral
Keywords: nanotechnology, water, management

Summary:

In addition to the worldwide present pollution coming from human activity, different seasonal biogenic toxicity can be found widespread in water resources, soils and, afterwards in the food chain, provoking diseases in animals and humans as well as economic losses.

The list of contaminants that can be found in fresh water presents a wide chemical profile (nanoparticles, toxins, polycyclic aromatic hydrocarbons(PAH), dyes, drugs, endocrine disruptors, heavy metal ions HMs etc), and sizes in the nanometre range, posing a technical challenge for their monitoring and removal. Conventional waste water methods like coagulation and filtration are ineffective for nanometric pollutants, and alternative methods, like toxins inactivation by added sequestrant chemicals or biotransformation agents, provokes concerns on animal/ human health on large terms since all chemicals remain inside the alimentary matrix of interest.

Magnetic nanostructured agents, with tailored specific catalytic properties and chemical affinities, and combined into macroscopic hybrids with reported remediation abilities (clays, active carbon, alginate, etc), provide a new generation of toxins/pollutants cleaning agents that can be separated from the matrix material by magnetic extraction which is considered a green technique.

In this work, a set of different magnetic nanostructured materials for magnetic extraction of metals and toxins are presented, with applicability for water, beverages, or alimentary matrices. The so prepared nanostructured materials, in figure1,, include nanoparticles of magnetite coated with carbon (fig.1.a) or aluminium hydroxide (fig.1.b) and particles in the millimetre range composed of biopolymers, magnetite nanoparticles and inorganic carbon, (fig.1.c) that have been tested for the magnetic extraction of HMs (Ce, Cu, Sr) and several

that range between the 50% and 80% of the initial amount. Reusability of the magnetic agents in also under study.

Figure 1. Magnetite coated with carbon (a) or aluminium hydroxide (b) and particles in the millimetre range composed of biopolymers, magnetite NPs and inorganic carbon, (c).

Biodegradation of Mukhaizna crude oil using thermophilic bacteria

Author(s): Felisbela Oliveira (Portugal1; Claudia Botelho (Portugal1; Eduardo Gudina (Portugal1; José Teixeira (Portugal1

Affiliation: 1 - Center of Biological Engineering (CEB, University of Minho, Campus of Gualtar, 4710-057 Braga, Portugal

Title: Biodegradation of Mukhaizna crude oil using thermophilic bacteria

Main domain: Water Resources
Presentation type: Oral
Keywords: Crude oil, thermophilic bacteria, bioemulsifier

Summary:

Oil pollution is a perpetual problem affecting terrestrial and marine ecosystems [1]. From 1970 to 2017 approximately, 5.74 million tons of oil were lost due to tanker incidents [2]. So, an efficient form to remove oil from ecosystems is required. For the past decades, microbial degradation technology has gained increasing interest in oil bioremediation. This work focused on the biodegradation of Mukhaizna crude oil (MCO using thermophilic bacteria from Geobacillus genus isolated from a hot spring in Azores, Portugal. The biodegradation process was performed in 100 mL Erlenmeyer flasks using MCO with enriched culture medium. The optimum medium culture conditions in terms of NaCl, (NH42SO4 and MCO concentration were determined, using central composite design for twobacterial strains G. thermodenitrificans and G. thermoleovorans. The optimum medium culture conditions varied depending on the strain. G. thermodenitrificans requires 2gL-1 NaCL, 1gL-1 (NH42SO4 and 2.29% (w/v MCO, while G. thermoleovorans needs a higher salt concentration 15gL-1 NaCL, 7 gL-1 (NH42SO4 and 0.8% (w/v MCO. After 7 days, both thermophilic bacteria decreased the solution surface tension from 70mNm-1 to 50mNm-1 and presented high yields of emulsifying activity (approximately 60%, where all or almost all of the hexadecane used (for emulsifying activity determination was emulsified. The bioemulsifier produced could emulsify the MCO, resulting in small droplets, as shows Fig. 1. Both strains presented a high ability to produce emulsifier using MCO as substrate.

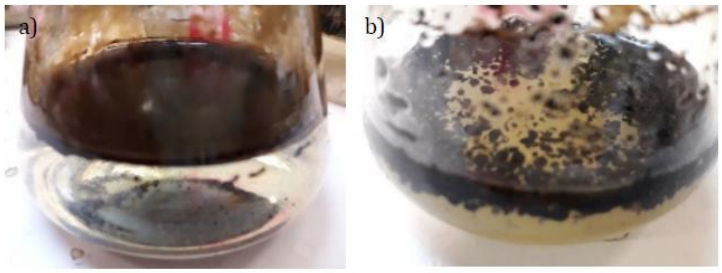

Figure 1 - a) Control; b) MCO treated at optimum conditions.

The degradation profile of MCO by the thermophilic bacteria, under optimum medium culture conditions (60 ºC and 200 rpm), was evaluated over a period of 20 days.

Until the 8th day MCO degradation increased, from this point onward the degradation slightly decreased. MCO has a complex mixture of hydrocarbons, but even so both strains were able to degrade 20% of it.

This work presents a promising strategy for the biodegradation of MCO with a simultaneous bioemulsifier production by the thermophilic bacteria, G. thermodenitrificans and G. thermoleovorans.

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- ABSTRACTS -

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Posters Presentation

AGRICULTURE I		
1st Author	Poster Title	Affiliation
Antonio María Borrero López	Propiedades reológicas y adhesivas de poliuretanos basados en lignina modificada y aceite de ricino: influencia de la fermentación en estado sólido con Streptomyces	1- Dpto. Ingeniería Química. Chemical Process and Product Technology Research Center (Pro2TecS). Universidad de Huelva. 21071 Huelva. Spain.
Adrián Tenorio-Alfonso	Optimización de la síntesis de adhesivos poliuretánicos curables con la humedad	1- Centro de Investigación de Tecnología de Procesos y Productos Químicos (Pro2TecS), Dept. Ingeniería Química, Universidad de Huelva, Campus de El Carmen, 21071 Huelva, España
Francisco José Santiago Medina	Nuevo método de formulación de geles de lignina y aceite vegetal	1- Pro2TecS-Chemical Process and Product Technology Research Center; 2 - Department of Chemical Engineering, University of Huelva, El Carmen Campus, 21071 Huelva, Spain
Ara Nuñez Montenegro	Innovative Nanocoatings for wood industry	1- FCUP; 2 - Ferreira Martins & Filhos-Madeiras e Derivados, S.A
Lei Wu	SERS-based detection of pesticide residues on fruit	1 - INL, Portugal
Shambhavi Yadav	Key Enabling Technologies & Forests: Exploring the Current Possibilities	1- Forest Research Institute (FRI), Uttarakhand (India), 2Food Quality & Safety Research Group, Department of Life Sciences, INL, Braga (Portugal); 2 - Food Quality & Safety Research Group, Department of Life Sciences, INL, Braga (Portugal)
Iria Rujido-Santos	DEVELOPMENT OF EXTRACTION METHODS FOR ISOLATING METALLIC NANOPARTICLES FROM TEXTILES	1 - Trace Element, Spectroscopy and Speciation Group (GETEE)
Brenda Luna	Edible nopal mucilage based films: physical-chemical characterization	1 - UANL - Universidad Autónoma de Nuevo León, Monterrey, México; 2 - INL - International Iberian Nanotechnology Laboratory, Braga, Portugal
Mª José Chapela	High added value industrial opportunities for microalgae in the Atlantic Area (EnhanceMicroAlgae project)	"1 ANFACO-CECOPESCA- 2 University of Manchester- 3 Iberian Nanotechnology Laboratory- 4 Université de La Rochelle- 5 Universidade da Coruña- 6 Faculty of Sciences of the University of Porto- 7 Swansea University-
Gokhan Durmaz	Extraction of polyphenols from blackcurrant pomace by a floatation method and with food grade surfactants	1 - Department of Food and Nutritional Sciences, The University of Reading

FOOD INDUSTRY I		
1st Author	Poster Title	Affiliation
Manuel Bañobre-López	Versatile lipid hybrid delivery systems for bioactive compounds	1 - AmTheNa, INL
Joana Carvalho	Miniaturization and optimization of devices for different DNA analysis steps	1 - International Iberian Nanotechnology Laboratory (INL); 2 - University of Santiago de Compostela (USC)
Kelly Johana Figueroa Lopez	Antimicrobial and Antioxidant Properties of Natural Extracts Included in Poly(3-hydroxybutyrate-co-3-hydroxyvalerate) Films	1 - IATA-CSIC
Beatriz Meléndez Rodríguez	Preparation and Characterization of Electrospun Films of Poly(3-hydroxybutyrate-co-3-hydroxyvalerate) Derived From Fruit Pulp Biowaste for Food Biopackaging	1 - Instituto de Agroquímica y Tecnología de Alimentos, IATA, CSIC
María Vanesa Taboada López	Enzymatic versus alkaline extraction of titanium dioxide nanoparticles from seafood	1 - Trace Elements, Spectroscopy and Speciation Group (GETEE),; 2 - University of Santiago de Compostela
Sarah Azinheiro	Sample pre-treatment improvement for faster pathogen detection in foodstuff	1 - International Iberian Nanotechnology Laboratory (INL)
Alejandro Garrido-Maestu	Isothermal amplification and their advantages for foodborne pathogen detection	1 - International Iberian Nanotechnology Laboratory (INL)
Sarah Azinheiro	Antimicrobial activity of chitosan nanoparticles in E.coli O157:H7	1 - International Iberian Nanotechnology Laboratory (INL)
Joana Margarida Dias Domingues	Phytantriol-F127-based cubosomes for antibiotic delivery	1 - CEB-Centre of Biological Engineering; 2 - INL-International Iberian Nanotechnology Laboratory
Arlete Marques	Optimization of nanospraydryer conditions for the production of lactoferrin-based nanoparticles	1 - Center of Biological Engineering, University of Minho, Campus de Gualtar, 4710-057, Braga, Portugal; 2 - International Iberian Nanotechnology Laboratory, Av. Meste José Veiga, 4715-330, Braga, Portugal

FOOD INDUSTRY II		
1st Author	Poster Title	Affiliation
Alexandra Teixeira	Microfluidics for the simple and low-cost fabrication of a SERS-based paper sensor with ultra-detection capability	1 - International Iberian Nanotechnology Laboratory (INL)
Nelson Mota De Carvalho	Insects, a pathway to a new nutritional source.	1 - Universidade Católica Portuguesa, CBQF - Centro de Biotecnologia e Química Fina – Laboratório Associado; 2 - Department of Food and Nutritional Sciences, The University of Reading
Krishna Kant	Smart microfluidic platform for rapid detection of foodborne pathogen	1 - International Iberian Nanotechnology Laboratory (INL), Braga,
Luz América Espinosa-Sandoval	Development an octenil succinic anhydride modified starch-based nanoemulsion coated with chitosan	1 - INL - International Ibearian Nanotechnology Laboratory; 2 - Universidad del Valle
Filipa Carvalho	Organosolv lignin for the production of nanoparticles: influence of production conditions in size distribution, polydispersity and zeta potential	1 - Universidade do Minho; 2 - International Iberian Nanotechnology Laboratory
João Costa	Evaluation of the impact of high pressure on the microbiological load of a acorn beverage	1 - Centro de Biotecnologia e Química Fina - Laboratório Associado, Escola Superior de Biotecnologia, Universidade Católica Portuguesa/ Porto; 2 - Department of Chemistry, Research Unit of Química Orgânica, Produtos Naturais e Agroalimentares (QOPNA), University of Aveiro; 3 - Centro de Biotecnologia e Química Fina - Laboratório Associado, Escola Superior de Biotecnologia, Universidade Católica Portuguesa/Porto, , 4202-401 Porto
Elisabete Alexandre	High pressure and ohmic heating assisted extraction of bioactive compounds from prickly pear peel and their antimicrobial activity	1 - Department of Chemistry, Research Unit of Química Orgânica, Produtos Naturais e Agroalimentares (QOPNA), University of Aveiro; 2 - ICAAM - Instituto de Ciências Agrárias e Ambientais Mediterrânicas, Universidade de Évora, Pólo da Mitra; 3 - Centro de Biotecnologia e Química Fina - Laboratório Associado, Escola Superior de Biotecnologia, Universidade Católica Portuguesa/Porto; 4 - CEB - Centre of Biological Engineering, University of Minho
João Trigo	Improvement of antioxidant activity and microbial safety of carrot juice	1 - Universidade de Aveiro; 2 - Universidade Católica Portuguesa/Porto
João Costa	Evaluation of the impact of high pressure on the microbiological load of a acorn beverage	1 - Centro de Biotecnologia e Química Fina - Laboratório Associado, Escola Superior de Biotecnologia, Universidade Católica Portuguesa/ Porto; 2 - Department of Chemistry, Research Unit of Química Orgânica, Produtos Naturais e Agroalimentares (QOPNA), University of Aveiro

FOOD INDUSTRY III		
Ana I. Bourbon	Chitosan films as a carrier of omega-3 loaded nanoemulsions: release behaviour on different food simulants	1 - International Iberian Nanotechnology Laboratory; 2 - International Iberian Nanotechnology Laboratory, Department of Life Sciences,; 3 - Centro de Engenharia Biológica, Universidade do Minho
Celso Ferreira	Microfluidics for controlled self-assembly of cubosome nanoparticles of tuneable size	1 - INL- International Iberian Nanotechnology Laboratory; 3 - University of Minho
Pieter De Beule	Nanoimaging of nutrient transporters	1 - INL- International Iberian Nanotechnology Laboratory
Paula Fajardo	Autochthonous Bacteria from cheeses for use as starter cultures	1 - University of Vigo; 2 - Polígono Industrial Sete Pontes; 3 - ANFACO-CECOPESCA
Manuela Pintado	Enzymatic Hydrolysis of Edible Insect Protein and Its Antioxidant Potential	1 - CBQF - Centro de Biotecnologia e Química Fina - Laboratório Associado; 2 - Escola Superior de Biotecnologia; 3 - Universidade Católica Portuguesa
Manuela Pintado	Impact of an anthocyanin rich blueberry extract upon Lactobacillus and Bifidobacterium adhesion to a CaCo-2 and HT29-MTX cell line	1 - CBQF - Centro de Biotecnologia e Química Fina – Laboratório Associado, Escola Superior de Biotecnologia, Universidade Católica Portuguesa
Gokhan Durmaz	Surfactant&Enzyme Assisted Extraction of Phenolic Compounds from Grape Marc	"1 DiSTAS, Department for Sustainable Food Process Faculty of Agricultural, Food and Environmental Sciences, Università Cattolica del Sacro Cuore, Italy 2 Department of Food & Nutritional Sciences, The University of Reading, Reading, United Kingdom 3 Inonu University, Department of Food Engineering, Malatya, Turkey "
Sandra Borges	Antioxidant peptides obtained from animal by-products: stability throughout gastrointestinal tract	"1 CBQF - Centro de Biotecnologia e Química Fina - Laboratório Associado, Escola Superior de Biotecnologia, Universidade Católica Portuguesa, Porto, Portugal 2 ETSA, Empresa Transformadora de Subprodutos, Loures, Portugal"
Ana R. Costa-Pinto	Development of chitosan and codfish hydroxyapatite pastes to evade prosthetic joint infections	"1Universidade Católica Portuguesa, CBQF - Centro de Biotecnologia e Química Fina – Laboratório Associado, Escola Superior de Biotecnologia, Rua Arquiteto Lobão Vital, 172, 4200-374 Porto, Portugal 2Institute of Nanotechnology, National Research Council, Lecce, Italy"

WATER RESOURCES		
1st Author	Poster Title	Affiliation
Jesus Valcarcel	Production of defined molecular weight chondroitin sulfate of marine origin by enzymatic hydrolysis	1 - Marine Research Institute (CSIC)
Ana S. Moura	Ethereal Guardians: in silico evaluation and water quality	1 - LAQV@REQUIMTE, Department of Chemistry and Biochemistry, University of Porto
Ana Castanheira	Cost-efficient chip for the detection of biotoxins inhibiting protein phosphatases	1 - International Iberian Nanotechnology Laboratory
Eva Castro-Villar	Dispersive liquid-liquid microextraction and ICP-OES to determine TiO2 nanoparticles in water samples	1 - Group of Trace Elements, Speciation and Spectroscopy (GETEE), Department of Analytical Chemistry, Nutrition and Bromatology, Faculty of Chemistry, University of Santiago de Compostela
Lisandra Alves	Removal of contaminants using magnetic composite beads	Removal of contaminants using magnetic composite beads
Manuel Antonio González Gómez	The use of magnetic nanocomposites for the elimination of mycotoxins and fluoride from aqueous media	1 - University of Santiago de Compostela
Laura Rodriguez-Lorenzo	Design of supported gold nanostars/ TiO2composite for near infrared-light-driven photocatalysis.	1 - International Iberian Nanotechnology Laboratory
Ana Vieira	Yessotoxin-loaded liposomes as microalgae-derived nanovehicles targeting cancer	1 - INL / University of Minho; 2 - University of Minho; 3 - INL

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AGRICULTURE ABSTRACTS

Propiedades reológicas y adhesivas de poliuretanos basados en lignina modificada y aceite de ricino: influencia de la fermentación en estado sólido con Streptomyces

Author(s): A. M. Borrero-López, C. Valencia*, J. M. Franco

Affiliation: Dpto. Ingeniería Química. Chemical Process and Product Technology Research Center (Pro2TecS). Universidad de Huelva. 21071 Huelva. Spain. **Author Title:** Propiedades reológicas y adhesivas de poliuretanos basados en lignina modificada y aceite de ricino: influencia de la fermentación en estado sólido con Streptomyces

Main domain: Agriculture
Presentation type: Poster
Keywords: lignina, streptomyces, reología

Summary:

En este trabajo se ha estudiado el uso de lignina procedente de paja de cebada sin tratar y tratada con *Streptomyces* 301 a 45ºC como aglutinante de adhesivos basados en poliuretano. Para obtener adecuadas propiedades viscoelásticas y adhesivas, aceite de ricino y diisocianato han sido seleccionados como solvente y agente entrecruzante respectivamente. Los adhesivos se prepararon utilizando un proceso novel donde ningún disolvente o catalizador perjudicial fue utilizado. Los productos resultantes han sido analizados por espectroscopía infrarroja (FTIR), análisis termogravimétrico (TGA), caracterización termoreológica, ensayos mecánicos y tipo de fractura, generando excelentes resultados reológicos y de adhesión en diferentes superficies.

Optimización de la síntesis de adhesivos poliuretánicos curables con la humedad

Author(s): A. Tenorio-Alfonso, M.C. Sánchez, JM. Franco

Affiliation: Centro de Investigación de Tecnología de Procesos y Productos Químicos (Pro2TecS, Dept. Ingeniería Química, Universidad de Huelva, Campus de El Carmen, 21071 Huelva, España.

Title: Optimización de la síntesis de adhesivos poliuretánicos curables con la humedad

Main domain: Agriculture
Presentation type: Poster
Keywords: adhesivo, aceite de ricino, acetato de celulosa

Summary:

Recientemente, la sustitución de materias primas procedentes del petróleo por sustancias naturales en la producción industrial de poliuretanos se ha convertido en uno de los principales objetivos de la investigación. La síntesis de poliuretanos se lleva a cabo tradicionalmente mediante la reacción selectiva entre grupos isocianatos e hidroxilos, produciendo la típica estructura segmentada. En este estudio, se analiza la reacción de policondensación basada en el empleo de disolventes comparada con un nuevo protocolo libre de disolvente. Así pues, se evaluó el impacto de la metodología de preparación y las proporciones de los reactivos sobre la estructura química, el comportamiento termo-mecánico y el rendimiento de adhesión. Como resultado, los bioadhesivos mostraron una estabilidad térmomecánica mejorada, con fuerzas adhesivas mejoradas al aplicar el protocolo propuesto.

Nuevo método de formulación de geles de lignina y aceite vegetal

Author(s): F.J. Santiago-Medina1,2, J.M. Franco1,2, C. Valencia1,2

Affiliation: 1 Department of Chemical Engineering, University of Huelva, El Carmen Campus, 21071 Huelva, Spain
2 Pro2TecS-Chemical Process and Product Technology Research Center, University of Huelva, 21071 Huelva, Spain

Title: Nuevo método de formulación de geles de lignina y aceite vegetal

Main domain: Agriculture
Presentation type: Poster
Keywords: Lignin; Castor oil; Diamine; Epoxide

Summary:

La lignina es un producto residual de las industrias papeleras, del cual se generan miles de toneladas anualmente. En los últimos años, se están buscando nuevas vías de valorización de este polímero natural, entre ellas la fabricación de oleogeles para la preparación de grasas lubricantes. Sin embargo, hasta el momento, la mayoría de estas formulaciones requieren el uso de isocianatos u otras sustancias medioambientalmente poco amigables para su estabilización. En el presente trabajo se pretende desarrollar una nueva formulación para la obtención de oleogeles a partir de lignina y aceite de ricino, en combinación con epóxidos y diaminas, estudiando diferentes protocolos de adición a temperatura ambiente.

Innovative Nanocoatings for wood industry

Author(s): Ara Nuñez Montenegro,a* Diana Crista,a Joaquim Esteves da Silva,b Albino Seabra,a Pedro Martinsa
Affiliation: a Ferreira Martins & Filhos - Madeiras e Derivados, S.A., Braga, Portugal S.A., Braga, Portugal
b Faculdade de Ciências da Universidade do Porto; Departamento de Geociências, Ambiente e Ordenamento de Território, Porto, Portugal

Title: Innovative Nanocoatings for wood industry

Main domain: Agriculture
Presentation type: Poster
Keywords: nanocoating, photonic crystal, environmental friendly

Summary:

Wood is a widely used natural and sustainable building material that is the basis of one of the most traditional Portuguese industrial sectors with an important economic impact [1].
To open up new markets, the natural properties of wood and wood-based materials should be broadened while maintaining their intrinsic and unique properties. With this in mind, and betting on innovation, a family company Ferreira Martins & Filhos-Madeiras e Derivados, S.A., in collaboration with a group of researchers from the University of Porto, is developing nanoparticle-based coatings to provide the wood unique aesthetic characteristics.
The technology associated within this work will allow the development of products that do not paint the wood, maintaining not only its natural characteristics (strength, durability, odor), but also providing two different attributes: a butterfly effect and phosphorescent properties, based on the use of photonic crystals and phosphorescent pigments.
Photonic crystals (PC) [2] are responsible for the characteristic iridescence of butterflies' wings, being iridescence classified as the process in which the color of a surface varies depending on the angle and observation and source of illumination. Thus, the use of PC in the wood and derivatives will provide an iridescent effect to these materials.
On the other hand, coatings that provide emission of light without electric source have had a growing dem and. A wood oil with phosphorescent pigments was developed [3]. This new product will provide phosphorescent properties to wood and derivatives emitting light at night without any electricity source.

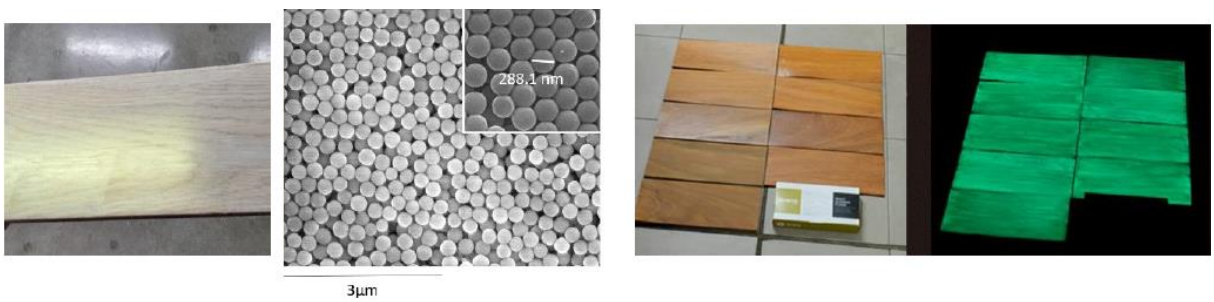

Fig. 1. (A) Wood plank with PC and its SEM analysis and (B) wood planks with phosphorescent oil with and without day light

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

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SERS-based detection of pesticide residues on fruit

Authors: Lei Wu
Affiliation name: INL, Portugal

Title: SERS-based detection of pesticide residues on fruit

Main domain: Agriculture
Presentation type: Poster

Keywords: SERS, pesticide, fruit

Summary

Pesticides have been widely used to protect fruits from insects and diseases. Conventional mass spectroscopy and chromatography methods are time-consuming and expensive. There is a great demand for developing rapid, sensitive and straightforward techniques for on-site analysis of pesticide residues. Surface enhanced Raman spectroscopy (SERS provides a potential useful tool for pesticide analysis. Because of the high sensitivity and the fingerprint information provided by SERS, pesticide could be identified through the characteristic Raman peaks. Moreover, the acquisition of SERS spectrum is a rapid and non-destructive, which makes it a good candidate for on-site real-time analytical tool. [1]

[1] Y.Z. Zhang, L. Wu and Y.P. Cui*, Analyst, 139, 5148 (2014).

Development of extraction methods for isolating metallic nanoparticles from textiles

Iria Rujido-Santos, Paloma Herbello-Hermelo, María del Carmen Barciela-Alonso, Pilar Bermejo-Barrera, Antonio Moreda-Piñeiro

Trace Element, Spectroscopy and Speciation Group (GETEE, Department of Analytical Chemistry, Nutrition and Bromatology. Faculty of Chemistry. Universidade de Santiago de Compostela. Avenida das Ciencias, s/n. 15782, Santiago de Compostela. Spain.

Main domain: Water Resources.

Presentation type: Poster.

Keywords: Nanometrology, textiles, sp-ICP-MS.

Summary

Textile modification with metallic nanoparticles has been developed in the last decade for improving certain physical and chemical properties. In particular, antimicrobial fibers are obtained before a chemical modification with silver nanoparticles (AgNPs), and the addition of zinc nanoparticles (ZnONPs) to the yarns provides ultraviolet light protection textiles. Nevertheless, the NPs that are embedded into the textiles can be released during home laundering reaching thus wastewater treatment plants. Once there, the NPs are accumulated in the sewage sludge which is widely used as fertilizer [1], entering in this way into the food chain.

In the current communication, two pre-treatment methods for extracting AgNPs (mechanical extraction under controlled temperature) and ZnONPs (sonication) from textiles were performed before the analysis by sp-ICP-MS. The whole methods were optimizated, validated and applied to several textile products.

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Edible nopal mucilage based films: physical-chemical characterization

Authors: Brenda Luna[1,2*], Gabriela Azevedo[2], Humberto Rodríguez[1], Mayra Treviño[1], Cristian Ávila[1], Romeo Rojas[1], Lorenzo M. Pastrana[2] and Miguel A. Cerqueira[2]

Afiliation:

UANL - Universidad International Autónoma Nuevo León, Monterrey, MéxicoBraga, Portugal

INL - International Iberian Nanotechnology Laboratory

Main domain: Agriculture and Food Industry

Presentation type: Poster communication

Plain abstract summary:

The *Villanueva* and *Copena F1* are nopal species (*Opuntia ficus indica*) cultivated in Mexico and are used as fruit, vegetable and fodder. The major plant component is a ramified polysaccharide called mucilage which comprises arabinose, galactose, rhamnose and xylose as neutral sugars [1-2]. In addition, the mucilage also contains a fibrous material (30–40%) that can be found in a soluble or insoluble state depending on physiology and age of the plants [3].The mucilage extract could be used for several applications in food industry, such as edible coatings and films. The aim of this work was to produce films based on mucilage extracted of the *Villanueva* and Copena *F1* nopal with a state of maturity of 45 days cultivated in a hydroponic system, and to compare the morphology, physical and mechanical properties (solubility, mechanical properties, water vapour permeability) with a commercial mucilage film. In addition, is also proposed to study the effect of insoluble fibrous material on properties of the films. Edible films were produced with mucilage (2.5% wt), pectin (2% wt) and glycerol (0.5%wt) by the casting method. Results showed that the mucilage extract (without and with insoluble fibrous material) can be used to produce edible films with good processability. Films using mucilage extract were totally soluble in water within 1 h, unlike commercial mucilage films that contains 10% of insoluble material. The mechanical properties were similar between commercial mucilage films and mucilage extract films but decreased for mucilage films with insoluble fibrous material. Overall, results showed that mucilage extract can be used as one of the main components for the production of films and coatings, foreseeing their use in food applications.

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[3] Marín, M., Chanona, J., and Guemes, N. Industrial Crops and Products, 123, Pages 707-718 (2018).

Key Enabling Technologies & Forests: Exploring the Current Possibilities

Authors: Shambhavi Yadav[1, 2], Joana Carvalho[2], Andrey Ipatov[2], Alejandro Garrido-Maestu[2], Sarah Azinheiro[2], J. Rafaela Guerreiro[2], Monisha Elumalai[2], Marta Prado[2]

Affiliation name: [1]Forest Research Institute (FRI), Uttarakhand (India), [2]Food Quality & Safety

Research Group, Department of Life Sciences, INL, Braga (Portugal)

Title: Key Enabling Technologies & Forests: Exploring the Current Possibilities

Main domain: Forestry/Agriculture

Presentation type: Poster

Keywords: Forests, Nanotechnology, Sustainability

Plain abstract summary

Increasing human interventions has burdened and degraded forest resources to a large extent. Nano- and biotechnologies offer wide applications that could contribute to ensure forest sustainability. Applications in wood and paper industry of micro- and nanotechnology-based approaches is gaining pace [1]. Here, we discuss possible uses of these technologies to address challenges in forest management. Our group is working on the development of miniaturized devices following a modular approach in order to evaluate each step of analysis, such miniaturized devices involve: DNA

purification modules, DNA amplification modules, and DNA detection modules [2]. Developing devices based on innovative micro/nanoscale platforms would allow fast and *in situ* nucleic acid based timber identification and tracking and also non-wood forest products (medicinal plants, oils) authentication. Nanomaterials-assisted detection methods can be employed in developing assays/sensors for rapid and early detection of pathogens in clonal nursery plantlets, seeds, and forest soil and water samples among others. Thus, rapid growth of nanotechnology in various sectors may over time be transferred and applied to development of forestry as

well.

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High added value industrial opportunities for microalgae in the Atlantic Area (EnhanceMicroAlgae project)

Authors: Mª José Chapela (Spain)1; Paula Fajardo (Spain)1; Federica Farabegoli (Spain)1; Mayte Alvarez (Spain)1; Mercedes Alonso (Spain)1; Martiña Ferreira (Spain)1; Mohamed Soula (Spain)1; Victoria Fernández (Spain)1

Affiliation: 1 - ANFACO-CECOPESCA

Title: High added value industrial opportunities for microalgae in the Atlantic Area (EnhanceMicroAlgae project)

Main domain: Agriculture
Presentation type: Poster
Keywords: microalgae, opportunities, Atlantic

Abstract Summary:

Microalgae production for high added value compounds is identified as a business sector with high growth potential in the coming decades, especially in the Atlantic Area. Whereas scientific knowledge about microalgae production and applications in different areas (nutritional, cosmetic, pharmaceutical) has steadily developed in the last decades, the industrial exploitation of these advances is far behind. So, EnhanceMicroAlgae project aims to facilitate the development of industrial and business opportunities in the microalgae sector within the Atlantic regions of Ireland, UK, France, Spain and Portugal, through the analysis of skills, gaps and opportunities, the development of study cases and Decision Support Tools, the incorporation of emerging technologies and the promotion of spin-offs and qualified employment.

In quest of green & sustainable technologies for a circular economy of water in agriculture

M. Canle,* M.I. Fernández, M. Iazykov, Z. Marín, S. Aguilar, D.R. Ramos, J.A. Santaballa

Universidade da Coruña, Chemical Reactivity & Photoreactivity Group,

Dept. of Chemistry, Faculty of Sciences & CICA, E-15071, A Coruña, Spain

Environmental pollution is currently one of the greatest challenges, and photocatalysis is a promising efficient decontamination alternative. In many cases, “wastewater” or “sewage” may be valorized, profiting from different advanced oxidation technologies, with a view to a circular economy of water. The resulting treated water may be used, for example for irrigation, reducing the impact on water reservoirs, potabilization costs, etc.

Among different available photocatalysts, nanosized particles of different semiconductors have shown great advantages. However, photocatalysis is much more efficient in suspension, and the subsequent need for filtration reduces its efficiency by increasing the energy cost of the process… To reduce costs and improve separation, thin films of photocatalyst can be deposited onto particles that may be easily filtered out or separated from solution. To improve the binding of the catalyst to the surface, different pre-treatments are available, trying to increase surface microroughness to favor adhesion and prevent abrasion of the films.

We used different photocatalytic approaches to the degradation of common persistent water pollutants: pesticides, pharmaceuticals, dyes, ionic liquids, etc., including kinetic, thermodynamic and analytical aspects.[1-4] We explored homogeneous and heterogeneous methods, generated thin films, doped the structure of photocatalysts to make them more effective, tried to profit from potential synergies of composite structures and dissolved natural components, etc. Here, we briefly discuss some of the obtained results, as well as some of the advantages and disadvantages of each method.

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FOOD INDUSTRY ABSTRACTS

Versatile lipid hybrid delivery systems for bioactive compounds

Authors: Lorena García-Hevia, Juan Gallo, Manuel Bañobre-López

Affiliation name Advanced (magnetic) Theranostic Nanostructures Lab, Department of Life Sciences, International Iberian Nanotechnology Laboratory

Title Versatile lipid hybrid delivery systems for bioactive compounds
Main domain: Agriculture, Food Industry
Presentation type: Poster
Keywords: Delivery systems, therapy, monitoring
Plain abstract summary

A wide range of delivery systems have been proposed to improve in one way or another (solubility, stability, pharmacodynamics, phamacokynetics, biodistribution…) the performance of conventional bioactive formulations.[1,2] Among these systems, lipid-based nanostructures appear as appealing candidates due to the simplicity and scalability of their preparation. The combination of lipid delivery systems with inorganic nanostructures enables the incorporation of new properties into these vehicles, whether it is responsiveness, traceability or imaging capabilities.

In this context, we present the preparation and characterisation of a highly versatile hybrid nanocomposite based on the combination of a solid lipid system and inorganic nanoparticles. As an example, magnetic[3] and paramagnetic nanoparticles (imaging by MRI, T effectors through magnetic hyperthermia, O_2 generators) and HMF-quantum dots (fluorescent reporters) have already been co-encapsulated to create hybrid systems. A number of bioactive compounds have also been co-encapsulated, including chemotherapeutic (DOX, DCT) and analgesic/anti-inflammatory drugs (OncoA).

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Miniaturization and optimization of devices for different DNA analysis steps

Authors: Joana Carvalho[1], Alejandro Garrido-Maestu[1], Sarah Azinheiro[1], Andrey Ipatov[1], João Gaspar[2], Lorena Diéguez[3], Jorge Barros-Velázquez[4], Marta Prado[1]
Affiliation name:
[1]International Iberian Nanotechnology Laboratory, Department of Life Sciences, Nano4Food Unit, Food Quality & Safety Research Group, Braga, Portugal
[2]International Iberian Nanotechnology Laboratory, Department of Micro and Nanofabrication, Microfabrication and Exploratory Nanotechnology Research Group, Braga, Portugal
[3]International Iberian Nanotechnology Laboratory, Department of Life Sciences, Nano4Health Unit, Diagnostic Tools and Methods Research Group, Braga, Portugal
[4]University of Santiago de Compostela, Laboratory of Food Technology, Department of Analytical Chemistry, Nutrition and Food Science, Faculty of Veterinary Science, Lugo, Spain

Title: Miniaturization and optimization of devices for different DNA analysis steps

Main domain: Food Industry

Presentation type: Poster

Keywords: Miniaturized DNA analysis, µSPE, isothermal amplification

Plain abstract summary

DNA-based analysis has been implemented in the food sector for different applications, such as identification of genetically modified organisms (GMOs), detection of allergenic ingredients, detection of foodborne pathogens and for food authenticity and traceability purposes. The miniaturization of such analysis brings several advantages over conventional methods, for example the smaller volumes required, lower cost, portability and improved performance by being faster and more sensitive [1].
At INL our group has been developing miniaturized devices to perform the steps of DNA analysis from complex food samples. The first step is DNA extraction and purification, which is a critical step that should ensure an efficient recovery of DNA while removing other compounds that might interfere with further analysis steps. Two miniaturized devices for DNA purification are currently being developed and optimized to obtain the best DNA yield. A highly efficient protocol has been developed with one of the prototypes for DNA purification from olive oil [2], which is one of the food products most at risk of food fraud. The following steps of DNA analysis are DNA amplification and detection, which can be combined in a single step. Polymerase chain reaction (PCR) is the most widely used method but, in the last years, the development of alternative isothermal amplification techniques, such as loop-mediated isothermal amplification (LAMP) and recombinase polymerase amplification (RPA), has been increasing [3, 4]. These methods have several advantages over PCR, such as being performed at constant temperature, higher tolerance to the presence of inhibitors, reduced reaction time, less equipment and trained personnel requirements and, in the case of LAMP, possibility of naked-eye detection. Such advantages make these techniques more suitable to be integrated in a miniaturized device. With this in

isothermal DNA amplification and the preliminary results obtained have shown the potential of the device for this application.

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Antimicrobial and Antioxidant Properties of Natural Extracts Included in Poly(3-hydroxybutyrate-*co*-3-hydroxyvalerate) Films

Kelly J. Figueroa-Lopez[1*], S. Torres-Giner[1], Luis Cabedo[2] and J.M. Lagaron[1]

[1]Novel Materials and Nanotechnology Group, Instituto de Agroquímica y Tecnología de Alimentos (IATA), Calle Catedrático Agustín Escardino Benllonch 7, 46980 Valencia, Spain.

[2]Polymers and Advanced Materials Group (PIMA), Universitat Jaume I (UJI), Avenida de Vicent Sos Baynat s/n, 12071 Castellón, Spain.

ABSTRACT

The study of biodegradable materials with antimicrobial and antioxidant properties is of great interest for the development of packaging with active properties for food preservation [1] [2]. In this investigation the minimum inhibitory concentration and the inhibition of the DPPH free radical of natural extracts of oregano, rosemary and green tea were determined. These extracts were included in poly (3-hydroxybutyrate-co-3-hydroxyvalerate) fibers using the technique of electrospinning for the formation of active films. The antimicrobial performance of the films was evaluated against strains of *Staphylococcus aureus* and *Escherichia coli,* and the inhibition of the free radical DPPH in an open and closed system for 15 days. The films containing the different extracts achieved a greater inhibition of the two bacterial strains in the closed system; the film with oregano extract was the most effective one. In the inhibition of the free radical all the samples decreased the antioxidant activity at day 15 of evaluation. The developed materials are outlined for the design of active food packaging [3].

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Enzymatic versus alkaline extraction of titanium dioxide nanoparticles from seafood

Authors: María Vanesa Taboada-López, Paloma Herbello-Hermelo, Pilar Bermejo-Barrera, Antonio Moreda-Piñeiro

Affiliation: Trace Elements, Spectroscopy and Speciation Group (GETEE). Department of Analytical Chemistry, Nutrition and Bromatology. Faculty of Chemistry. Universidade de Santiago de Compostela. Avenida das Ciencias, s/n. 15782- Santiago de Compostela, Spain

Title: Enzymatic versus alkaline extraction of titanium dioxide nanoparticles from seafood
Main domain: Food Industry
Presentation type: Poster communication

Keywords: nanometrology, titanium dioxide nanoparticles, nanoparticles extraction

Plain abstract summary

Titanium dioxide nanoparticles (TiO_2 NPs) are hugely used in industry as an inorganic UV filter and as a food additive (E171) [1]. It is necessary to evaluate their presence on environment.
An ultrasound assisted enzymatic hydrolysis procedure has been proposed for a fast isolation of TiO_2 NPs from seafood. Optimum extraction conditions imply ultrasonication (60% amplitude) for 10 min with pancreatine:lipase [3]. Alkaline extraction was performed by sonication in an ultrasound water-bath the sample with TMAH 10% (v/v) for 2 hours. sp-ICP-MS measurements were performed and TiO_2 NPs concentrations with both methods were compared.

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Development of nanostructured lipid carriers based on oleogel using rhamnolipids as surfactant

Authors: Maria A. Azevedo[1,2,*], Artur J. Martins[2], António A. Vicente[2], José A. Teixeira[2], Lorenzo Pastrana[1], Miguel A. Cerqueira[1]

Affiliation:

(1) INL - International Iberian Nanotechnology Laboratory, Braga, Portugal

(2) CEB – Centre of Biological Engineering, University of Minho, Braga, Portugal **Main domain:** Food Industry

Presentation type: Poster communication

Keywords: nanostructured lipid-carriers; oleogel; biosurfactant

Plain abstract summary:

Food and pharmaceutical industries face important challenges regarding the delivery of lipophilic compounds with bioactive properties. Issues such as poor water solubility, degradation under harsh conditions and unsatisfactory bioavailability, are limitations that should be overcome. Nanostructured-lipid carriers (NLC's) are presented as one of the answers due to their unique features (e.g. easy scalability, presence of digestible lipids, possible absence of solvents and the use of food-grade materials during production) [1]. It is also important to find new bio-based and biodegradable food-grade materials with new well-known properties, such as biosurfactants produced by microorganisms [2]. Due to their physico-chemical properties (low toxicity, high biodegradability, high selectivity, low micelle concentrations and effectiveness at extreme temperatures, pH's and salinities), the biosurfactants are already used in the food industry to improve, for example, texture, organoleptic properties and creaminess of products [3,4]. With that in mind, a strategy based on a lipid structuring mechanism was used to produce bioactive lipid-based nanostructures. Such mechanism was directed towards the development of a self-assembled nano-structure, using gamma-oryzanol and beta-sitosterol as structuring agents. This phytosterols binary mixture has the ability to impart anti-oxidant functionality without needing additional lipophilic bioactive compounds. It is important to mention that phytosterols have authorized disease risk-reduction health claims in place by the European Union [5]. In order to develop NLC's, high energy methodologies involving ultra-homogenization followed by ultra-sonication at high temperature were applied. The samples were prepared with 8 or 10% (w/w) of a solid fraction of sterols using different concentrations (0.05 and 0.01%) of rhamnolipids. The NLC's produced with 8 and 10% of total sterol solids, dispersed in 0.05% of rhamnolipids, showed a polydispersity index (PDI) of approximately 0.230 and particle size distribution around 180 nm. NLC's prepared with 0.01% of rhamnolipids did not reveal the same stability (evaluated by size and PDI). Particle size was confirmed by transmission electron microscopy. The intrinsic bioactivity of such nano-carriers, conferred by the molecules that self-assemble to induce lipid gelation at nano-scale, represents an important step towards the delivery of functionality in complex food systems and pharmaceuticals.

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Sample pre-treatment improvement for faster pathogen detection in foodstuff

Authors: Sarah Azinheiro, Alejandro Garrido-Maestu, Joana Carvalho, Marta Prado
Affiliation name: Food Quality and Safety Group. International Iberian Nanotechnology Laboratory, Avenida Mestre José Veiga s/n, 4715-330 Braga, Portugal

Title: Sample pre-treatment improvement for faster pathogen detection in foodstuff
Main domain: Food Industry
Presentation type: Poster

Keywords: Food sample processing, bacteria concentration, pathogen detection.

Plain abstract summary

Food-borne zoonotic diseases are a significant and widespread global public health threat. In the European Union (EU), over 320,000 human cases are reported each year, but the real number is likely to be much higher. Foodborne pathogens are responsible for diseases whose severity varies from mild symptoms to life-threatening conditions, affecting both developing and developed countries. In 2016, the EFSA and ECDC annual report revealed 3,869 hospitalization cases do to foodborne outbreaks and 20 of them died [1]. Despite the effort to improve food analysis and detect the pathogen before human infection, a faster methodology need to be developed. Molecular techniques have been optimized to replace traditional culture-based analysis, however all bench-top techniques need a pre-enrichment step that takes between 18-48h, depending on the microorganism to identify [2]. Reduction of sample pre-treatment time is needed, however until now no significant improvement have been done.

For this reason, different strategies started to be investigate, to allow a faster sample treatment without losing sensitivity. Techniques for an efficient pathogen separation and concentration, such as antibody-, physical- and chemical-based methodologies [3-4], need to be involved to avoid false-negative results.

Here we present different strategies tested by the Food Quality and Safety research group of INL to overcome the drawbacks associate with sample processing and improve food analysis, allowing a safe food production chain. Different approaches, such as the degradation of sample tissue, the use of imunomagnetic separation and the detection of bacteriophage, are evaluate and compare.

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Isothermal amplification and their advantages for foodborne pathogen detection

Authors: Alejandro Garrido-Maestu, Sarah Azinheiro, Joana Carvalho, Marta Prado
Affiliation name: Food Quality and Safety Group. International Iberian Nanotechnology Laboratory, Avenida Mestre José Veiga s/n, 4715-330 Braga, Portugal

Title: Isothermal amplification and their advantages for foodborne pathogen detection
Main domain: Food Industry
Presentation type: Poster

Keywords: Isothermal amplification, Pathogen detection, Food analysis.

Plain abstract summary

With 4786 food- and waterborne outbreaks in 2016, foodborne pathogens continue to be a real issue in the food production chain, affecting millions of people around the world [1]. Official methods for the detection of foodborne pathogens are based on classical microbiology which require several days for bacterial isolation and identification. Fast and reliable analytical methods are needed by the industry and control laboratories. The objectives of such methods are to ensure the health of consumers, to easily determine whether a food product has been contaminated, and if possible, identify how and when this contamination occurred.

For this purpose DNA-based techniques represent a real advantage compared with traditional methodology, reducing time of analysis without compromising the sensitivity and specificity [2]. DNA amplification techniques have evolved since the "gold-standard" PCR technique was developed, novel isothermal amplification techniques have emerged in recent years with the goal of providing an analytical solution to some of the drawbacks associated with PCR/qPCR, especially due to their simplicity and reduced thermal budget, making miniaturization easier due to simpler thermal control and lower energy consumption [3]. Such isothermal techniques include Loop mediated isothermal amplification (LAMP), Recombinase Polymerase Amplification (RPA), Strand Displacement Amplification (SDA), among others.

At INL we are working on the development and optimization of several isothermal amplification methods for the foodborne pathogens detection. Different methodology have been optimized and compare for the identification of *Salmonella* spp. and *Listeria monocytogenes* by LAMP and RPA.

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Antimicrobial activity of chitosan nanoparticles in *E.coli O157:H7*

Authors: Sarah Azinheiro, Joana Carvalho, Marta Prado, Alejandro Garrido-Maestu,
Affiliation name: Food Quality and Safety Group. International Iberian Nanotechnology Laboratory, Avenida Mestre José Veiga s/n, 4715-330 Braga, Portugal

Title: Antimicrobial activity of chitosan nanoparticles in *E.coli* O157:H7
Main domain: Food Industry

Presentation type: Poster
Keywords: Antimicrobial activity, Chitosan, E.coli O157:H7

Plain abstract summary

Chitosan is a deacetylated form of chitin, and can be obtained from crustacean shells (crabs, shrimp and crayfishes) and also produced by some fungi (*Aspergillus niger*, *Mucor rouxii*, *Penecillium notatum*) [1]. Due to the possibility of application in food and pharmaceutics, chitosan gained more interest, being used as enzymatic inhibitor, antioxidant, and antimicrobial [2], and have the advantage to be safe for human consumption. The antimicrobial activity of chitosan have been proved in several studies [3]. Different preparation of chitosan can result in distinct distribution of acetyl groups, the chain length and the conformational structure of chitosan, influencing its activity. The antimicrobial mechanism is still not fully elucidated and results can be conflicting, as the size of the particles and the concentration can have a different effect depending on the organism and the type of chitosan used [4].

We evaluated the antibacterial properties of chitosan nanoparticles against the foodborne pathogen, E.coli O157:H7. 6,378 confirmed human cases of Shiga toxin-producing *E.coli* infection were reported by EFSA and ECDC, being the 4th between the zoonoses evaluated in terms of prevalence [5]. Preventive measures to control the growth of microorganism would be of high interest for the food industry. The concentration and type of chitosan were optimized to have the highest inhibition possible, for future use in food products.

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Phytantriol-F127-based cubosomes for antibiotic delivery

J. Domingues[1,2*], MO. Pereira[1], AM. Sousa[1], BFB.Silva[2]
[1]CEB-Centre of Biological Engineering, LIBRO- Laboratório de Investigação em Biofilmes Rosário Oliveira, University of Minho, Campus de Gualtar, 4710-057 Braga, Portugal;
[2]INL-International Iberian Nanotechnology Laboratory, 4715-330 Braga, Portugal.

The delivery of drug molecules in the treatment of diseases usually faces problems of solubility, bioavailability and site targeting. The use of cubosomes – nanostructured lipid-based nanoparticles consisting of lipid bilayers arranged in a cubic bicontinuous lattice – as drug nanocarriers has the potential to address several of these obstacles [1]. Some of the advantages over the more conventional liposomes are: increased surface area, lipophilic volume (for loading lipophilic drugs) and high heat stability. As a drawback, cubosomes tend to aggregate with time, and therefore they need to incorporate a stabilizer (e.g. block copolymer F127) on their surface to provide them with colloidal stability.
In this work we developed a simple experimental procedure able to produce cubosomes of controlled-size. A bottom-up approach (solvent-shifting) [2] was used to form the cubosomes, involving the rapid mixing of a lipid-ethanol solution with an excess of water and polymer (F127), and using minimal energy input [1,2]. We observed that we can control the final cubosome size by adjusting the initial lipid-ethanol composition and concentration of F127. Moreover, cubosomes were easily loaded with ciprofloxacin (CIP), a fluoroquinolone antibiotic that is administrated to treat infections caused by gram-negative bacteria, without perceived structural changes.
The final dispersions were characterized in terms of particle size (hydrodynamic diameter) and polydispersity index (PDI) using a dynamic light scattering instrument (DLS). The obtained results demonstrated that our procedure was able to produce relatively monodisperse cubosomes with diverse diameters in a controlled-size way, ranging from 200 nm to 370.
We anticipate that the ability to control the cubosome size can facilitate the elucidation and optimization of the modes of action of antibiotic-loaded cubosomes against bacteria in a mucous matrix, giving rise to more efficient therapies against bacterial infections in cystic fibrosis patients. In

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Optimization of nanospraydryer conditions for the production of lactoferrin-based nanoparticles

Authors: Arlete M. Marques[a,b], Ana I. Bourbon[b], Lorenzo M. Pastrana[b], José A. Teixeira[a], Miguel A. Cerqueira[b]

Affiliation: [a] Center of Biological Engineering, University of Minho, Campus de Gualtar, 4710-057, Braga, Portugal; [b] International Iberian Nanotechnology Laboratory, Av. Meste José Veiga, 4715-330, Braga, Portugal

Title Optimization of nanospraydryer conditions for the production of lactoferrin-based nanoparticles **Main domain:** Food Industry
Presentation type: Poster

Keywords: nanotechnology, protein, nanostructure.

Plain abstract summary

Lactoferrin is a single chain glycoprotein isolated from the bovine milk, and it has been considered a multifunctional protein with a lot of benefits for human's health and also for cancer prevention. This protein has captured a lot of interest due to its antimicrobial, antiviral, antifungal, anti-inflammatory and antioxidant activity. Lactoferrin structure is composed by two globular lobes, the N-lobe and C-lobe, and has a molecular weight of 80 kDa. Lactoferrin can also be used as a carrier of bioactive compounds, such as iron (due to its iron-binding properties); however new methods are needed to guarantee their processability without losing their unique characteristics. One of the possibilities is to use the nanospraydrying. Nanospraydrying consists in a quick one-step process that transforms different types of solutions (aqueous or organic solutions, emulsions, dispersions and suspensions) into dry particles, by spraying the solutions in a hot medium that causes a rapid and efficient evaporation of the solvent and produces the nanoparticles with controlled size, shape, distribution, porosity, density, and chemical composition.

In this work lactoferrin nanoparticles were produced by nanospraydryer with an atomized head with the small nozzle size of 200 nm - 5 µm. Firstly, a high range of lactoferrin concentration was tested (0.1%, 0.5%, 1%, 2%, 3%, 4%, 5%, 8%, 10% and 12% (w/v)) in order to understand the effect of the lactoferrin concentration in the process stability and yield of production. The rehydration capacity of the obtained dried nanoparticles was determined and the nanoparticles were then characterized by electrophoresis and circular dichroism to study the effect of the nanospraydryer temperature in protein structure. Results shows that it is possible to use high concentrations of lactoferrin using the nanospraydyer process without changing their main structure.

The lactoferrin-based nanoparticles size, polydispersity and zeta potential were determined for the nanoparticles produced using concentrations of 1% (w/v), 5% (w/v) and 10% (w/v) of

lactoferrin solution by Dynamic Light Scattering, Nanoparticle Tracking Analyses (NS500) and Transmission Electron Microscopy. Results showed that is possible to obtained lactoferrin-based nanoparticles.

This study was supported by the Portuguese Foundation for Science and Technology (FCT) under the scope of the strategic funding of UID/BIO/04469 unit and COMPETE 2020 (POCI-01-0145-FEDER-006684) and BioTecNorte operation (NORTE-01-0145-FEDER-000004) funded by the European Regional Development Fund under the scope of Norte2020 - Programa Operacional Regional do Norte. Arlete M. Marques (SFRH/BD/132911/2017) is the recipient of a fellowship from Fundação para a Ciência e Tecnologia (FCT, Portugal)

Microfluidics for the simple and low-cost fabrication of a SERS-based paper sensorwith ultra-detection capability

Authors: **A. Teixeira**[1], J. F. Hernández-Rodríguez[1], L.Costa[1], K. Kant[1], L. Wu[1], S. Abalde-Cela[1], L. Diéguez[1] - INL - International Iberian Nanotechnology Laboratory

Title: Microfluidics for the simple and low-cost fabrication of a SERS-based paper sensor with ultra-detection capability
Main domain: Food Industry
Presentation type: Poster
Keywords: Nanotechnology, SERS, microfluidics

Key enabling technologies (KETs), such as nanotechnology, surface-enhanced Raman scattering (SERS) spectroscopy and microfluidics, have been thriving in recent years [1].Currently, the progressive improvement of nanotechnology allows a rapid development of numerous analytical techniques that can be applied to the food or environment fields. One of the techniques that most benefited by nanotechnology advances is SERS. This ultrasensitive sensing technique overcomes the intrinsic low efficiency of Raman by using nanoparticles, reaching up to enhancing factors of 10^{12}-10^{14} orders of magnitude [1]. The high sensitivity of this analytical tool allows it to be used in chemical and biological analysis, even at very low detection limits [2]. However, it has been challenging to obtain consistent and reproducible SERS spectroscopic substrates due the commonly uncontrolled experimental conditions. Herein, in order to control the fabrication of the SERS active substrates, the intrinsic reproducibility of microfluidics technology was used for the fabrication of self-assembled nanoparticle structures over a paper film. SERS substrates using anisotropic particles, such as gold nanostars (AuNSTs) and nanorods (NRs), offer an extra signal enhancement. Thus, AuNSTs and Au@AgNRs were synthesized by following conventional wet chemistry protocols with slight modifications [3, 4]. The use of a PDMS-paper hybrid device for the self-assembly of nanoparticles offered the ideal environment to control the drying kinetics of nanoparticles over the paper substrate. This method allowed a higher reproducibility and homogeneity of the fabrication of SERS substrates through the continuous flow generated within microfluidic devices. This simple and low-cost fabrication of a paper-based sensing device has potential for on-site detection of food or water contaminants.

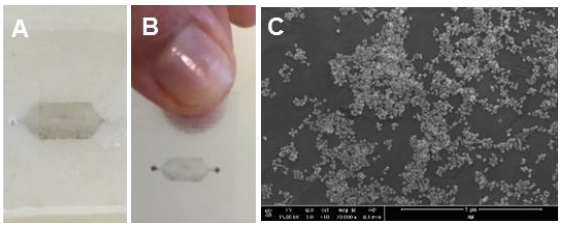

Figure 1. A) AuNSTs in paper-PDMS device. B) SERS substrates on paper. C) SEM image of AuNSTs on paper.

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Insects, a pathway to a new nutritional source.

Nelson Mota de Carvalho[a], Ana Raquel Madureira[a], Glenn Gibson[b],

[a]Universidade Católica Portuguesa, CBQF - Centro de Biotecnologia e Química Fina – Laboratório Associado, Escola Superior de Biotecnologia, Rua Arquiteto Lobão Vital, 172, 4200-374 Porto, Portugal.

[b]Department of Food and Nutritional Sciences, The University of Reading, RG6 6AP, UK.

Abstract

In contrast with other questions of our society, in terms of energy consumption, energy sources, and climate changes and concerns, nutritional challenges appear as an emergent field, connected not only to population's nutritional demands, but also to human health and metabolism equilibrium. Nowadays, medical sciences are taking new paths in the assessment of the individual's health state, i.e. by the evaluation of gut microbiota. Such evaluations are becoming precise and important indicators of the human organism's reaction to certain foods and to its general health status. Diet modulates and impacts on the gut microbiota in terms of functionality, upkeep and even composition. Thus, a relationship emerges, dynamically interlinking diet, the gut microbiota and the individual's state of health. The challenge is to find food sources that may be able to accomplish such dynamics with a positive outcome for the organism. Recently, insects are being pointed as a new nutritional source with proven farming and eco-friendly practices, good availability and high nutritional value. It only lacks the establishment of a connection between that new food source, its impact on the human organism, and its accessibility on day-by-day routine diet and eating habits. The research to be undertaken has to expose insects, and derived ingredients, as products with high nutritional potential, then to establish the impact of this food source in the human organism, by *in vitro* gut microbiota assays, and at the same time, to prove its potential benefits to health, thus identifying and giving solutions for its approval as novel food.

Then we may be at the edge of changing nutritional sources, the way that people eat, and even how they maintain their individual health.

Keywords: Nutrition, insects, gut microbiota.

Smart microfluidic platform for rapid detection of foodborne pathogen

Authors: Krishna Kant[1], Sarah Azinheiro[1], Marta Prado[1], Lorena Dieguez[1]
[1] *International Iberian Nanotechnology Laboratory (INL), Braga, Portugal*

Author contact information: krishna.kant@inl.int

Title: Smart microfluidic platform for rapid detection of foodborne pathogen

Main domain: Food Industry

Presentation type: Poster

Keywords: Microfluidic chip, Foodborne pathogen, Electrochemical detection

Food safety remains a noteworthy concern around the world. *Listeria monocytogenes* that is normally present in various type of food products such as raw meat products, ready-to-eat salads, unpasteurized fruit juices, cheese curds, and raw milk may cause foodborne and waterborne illnesses like flu-like symptoms, meningoencephalitis, abortion, neonatal sepsis, and central nervous system infections, which may lead to death [1]. So far, detection of *L.monocytogenes* in food samples continues to rely on selective culturing media which need a minimum of 2 days for detection and requires further confirmation tests. Comparing with this method, the immunoassays such as conventional enzyme-linked immunosorbent assay (ELISA) offers high selectivity, and reduced detection time [2]. However, it is still required to have a portable smart detector which can perform detection in short time and present very high sensitivity. Herein, we are presenting a smart microfluidic platform for direct capturing and detection of foodborne pathogen in real sample. Micro-milling and CO_2 laser cutting techniques are used to prepare the microfluidic system for using 3D sponge of PDMS [3]. These 3D sponge were successfully fabricated using grounded NaCl as template. The surface modification of sponge is mediated through amine-epoxide and anti-*L.monocytogenes* antibodies for capturing the bacteria [4]. This reaction resulted in very stable covalent binding of capturing ligands as well as pathogen bacteria (Fig 1). The capturing of bacteria over the 3D sponge is characterized by electron microscopy imaging. The sponges did not show a significant resistance to sample flow and can easily be incorporated in microfluidic sensing device. The electrochemical detection of *L.monocytogenes* over a large linear working range (10–10^6 CFU/mL) will be tested with an aim to achieve a sensitive limit of detection (LOD). This method could be a time saving and sensitive tool to be used in routine diagnosis of food material.

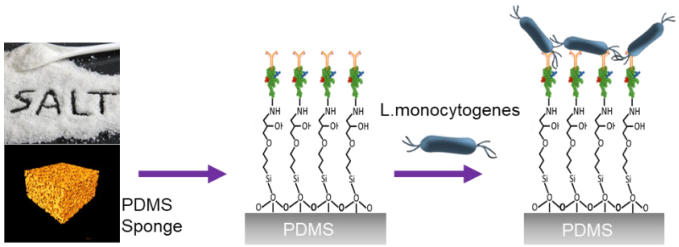

Fig. 1: Schematic representation of bacterial capturing over the 3D PDMS sponge.

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Development an octenil succinic anhydride modified starch-based nanoemulsion coated with chitosan

Espinosa-Sandoval, L.A.[a], Ochoa-Martínez, C.I.[a], Ayala-Aponte, A.A.[a], Goncalves, C.[b], Pastrana, L.[b], Cerqueira, M.A.[b*]
[a]School of food engineering. Universidad del Valle. 76001, Cali, Colombia.
[b]International Ibearian Nanotechnology Laboratory. Av. Mestre José Veiga. 4715-330, Braga, Portugal.
*__Correspondent author:__ miguel.cerqueira@inl.int

Main domain: Food Industry
Keywords: nanoemulsions, modified starch, chitosan

Abstract

Stabilizers used for food-grade nanoemulsions include small molecules such as tweens and spans. Despite its low cost and good efficiency, the food industry has increased its interest in replacing synthetic emulsifiers with natural alternatives to create products with “consumer-friendly” labels [1]. In this sense, there is a tendency to use biopolymers (proteins and polysaccharides) for the preparation and stabilization of nanoemulsions. Although the concentrations required for proteins are low, they tend to become denatured and precipitate due to high processing temperatures and fluctuations of the pH [2]. Therefore, the use of polysaccharides is preferable, however, only few have this capacity. One of the possibilities is to use octenil succinic anhydride modified starch (OSA-MS), besides its surfactant capacity it is stable against high temperatures, to a wide range of pH values and ionic strengths [3]. Other of the interesting polysaccharides that can be used as encapsulating material is chitosan. Chitosan is a bio-based, biodegradable and non-toxic polymer, that presents high biocompatibility (e.g. with OSA-MS) [4]. The objective of this study was to optimize the development of OSA-MS oil-in-water (O/W) nanoemulsions stabilized with chitosan. An emulsifier solution was prepared by dispersing 1.5% w/v of OSA-MS into water. ultraturrax (14000 rpm 2 min.) followed by ultrasound (7 min. 5ON–7OFF) was applied. Chitosan was added dropwise and mixed at 250rpm for 30 min. 13 concentrations of chitosan of medium and low molecular weight were assessed (from 0.12 to 7 mg/mL). The response variables were the particle size, the polydispersion index (PDI) and the charge in the emulsion droplets. The results showed that particle size remained between 100 and 400 nm for chitosan of medium and low molecular weight along all the concentrations. The PDI values were maintained between 0.2 and 0.3 when using concentrations up to 2 mg/mL and after this concentration the PDI values reach to 0.4 and 0.9 for chitosan of low and medium molecular weight, respectively. As for the surface charge, the stability was achieved at 2 mg/mL for both molecular weights. Results show that is possible to produce OSA-MS based nanoemulsions with chitosan as an additional layer.

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Organosolv lignin for the production of nanoparticles: influence of production conditions in size distribution, polydispersity and zeta potential

Filipa Carvalho[a], Miguel A. Cerqueira[b], Catarina Gonçalves[b], Lorenzo M. Pastrana[b], José A. Teixeira[a] and Michele Michelin[a]
[a]Centre of Biological Engineering, Universidade do Minho, Campus de Gualtar, 4710-057, Braga, Portugal
[b]International Iberian Nanotechnology Laboratory, Av. Mestre José Veiga s/n, 4715-330, Braga, Portugal

Keywords: lignocellulosic materials, nanotechnology, nanoprecipitation.

Lignin is one of the most abundant polymers and renewable resource obtained from lignocellulosic biomass. Organosolv is a promising chemical pre-treatment that involves the use of organic solvents such as methanol, ethanol or acetone for extracting lignin. Compared to other pre-treatment technologies, organosolv process is able to produce a high purity (low inorganic impurities and sulfur-free and low molecular weight (Mw lignin [1]. Due to its aromatic structure, lignin is a promising raw material for the synthesis of different biomaterials. Nowadays, innovative applications include UV-protective agents for cosmetics, new carriers for drug delivery and tissue engineering. Furthermore, the production of lignin nanoparticles (LNPs gained prominence due to its biodegradability and bioactive properties [2,3]. However, the properties of nanoparticles from organosolv lignin and the influence of the production conditions on the physico-chemical properties and morphology are unclear. For this reason, the objective of this work was to verify the influence of the conditions of production on the size, polydispersity index (PDI and zeta potential of LNPs. For that, LNPs were synthesized from ethanol organosolv lignin using the antisolvent precipitation method. A 2^3 central composite design was used, with the flow rate, lignin and antisolvent concentrations as independent parameters. Size distribution, PDI and zeta potential were evaluated using dynamic light scattering

(DLS. Results showed that, (a) lignin and antisolvent concentrations influenced the size of LNPs PDI was strongly influenced by the flow rate, (b) and the zeta potential was affected by the antisolvent concentration. This way, the average size by number obtained for LNPs were between 77.00 (± 5.67 nm and 364.68 (± 13.85 nm. LNPs presented values of PDI and zeta potential of 0.146 (± 0.01 and 0.475 (±0.03 and -32.36 (± 1.42 mV and -11.48 (± 2.65 mV, respectively. These results showed that it was possible to obtain LNPs with good physico-chemical properties and with potential for high value applications.

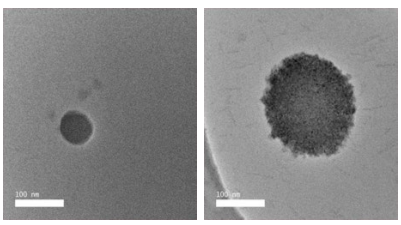

Fig 1. Transmission electron microscopy (TEM) images of lignin nanoparticles: (a) particles with 100 nm and (b) particles with 300 nm.

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Evaluation of the impact of high pressure on the microbiological load of a acorn beverage

Authors: João Costa[1]; Maria Vale[1]; Eduardo Costa[1]; Elisabete Alexandre[1,2]; Sara Silva[1]; Jorge Saraiva[2]; Manuela Pintado[1]

Affiliation:
1) Centro de Biotecnologia e Química Fina - Laboratório Associado, Escola Superior de Biotecnologia, Universidade Católica Portuguesa/Porto, Rua Arquiteto Lobão Vital, 4202-401 Porto, Portugal
2) Department of Chemistry, Research Unit of Química Orgânica, Produtos Naturais e Agroalimentares (QOPNA), University of Aveiro, Campus Universitário de Santiago, 3810-193 Aveiro, Portugal.

Title: Impact of high pressure on microbiological load of acorn beverages

Main domain: Food Industry

Presentation type: Poster
Keywords: High Pressure Processing; Surplus valorisation; Shelf life extension.

Plain abstract summary (narrative text maximum 350words)

Acorns, while frequently regarded as animal feed, are actually a part of the gastronomical folklore of North America and the Mediterranean areas. This fruit is produced by Quercus trees that are widely distributed around the globe which means that it is widely available and, if one considers that most are left uncollected, acorns are not only a relatively low cost raw material but a potential new means to improve the value of this type of tree. Nutritional and functionally wise, acorns possess an interesting potential as they are rich in bioactive ingredients (like phenolic compounds and tocopherol), polyunsaturated fatty acids while being gluten free and possessing a relatively high protein content. Therefore, the production of an acorn based beverage may be of interest particularly when considering groups with specific nutritional needs such as celiacs. However, raw acorn beverages have a small shelf life mostly due to their intrinsically high nutritional content but also initial microbial load. Taking this into account, the present work aimed to evaluate the potential of a high pressure approach upon the microbiological load of a commercially available acorn beverage in an attempt to extend their shelf life (from a microbiological standpoint). Overall the results showed that high pressure could extend the shelf life of the acorn beverage for up to 28 days.

High pressure and ohmic heating assisted extraction of bioactive compounds from prickly pear peel and their antimicrobial activity

Elisabete Alexandre[abc], Maria Duarte[cd], Marta Coelho[be], Antonio Vicente[e], Jorge Saraiva[a] and Manuela Pintado[b]

a) Department of Chemistry, Research Unit of Química Orgânica, Produtos Naturais e Agroalimentares (QOPNA), University of Aveiro, Campus Universitário de Santiago, 3810-193 Aveiro, Portugal.
b) Centro de Biotecnologia e Química Fina - Laboratório Associado, Escola Superior de Biotecnologia, Universidade Católica Portuguesa/Porto, Rua Arquiteto Lobão Vital, 4202-401 Porto, Portugal
c) CEBAL - Centro de Biotecnologia Agrícola e Agro-Alimentar do Alentejo/IPBeja – Instituto politécnico de Beja; Beja, Portugal
d) ICAAM - Instituto de Ciências Agrárias e Ambientais Mediterrânicas, Universidade de Évora, Pólo da Mitra, Évora, Portugal
e) CEB - Centre of Biological Engineering, University of Minho, 4710-057 Braga, Portugal.

Title: Emerging extraction technologies of antioxidant compounds from prickly pear peel

Main domain: Food Industry

Presentation type: Poster

Keywords: Emerging extraction technologies; Fruit by-products valorisation; Antioxidant and antimicrobial activities.

Usually, fruit peels are excellent sources of high added-value compounds with important bioactive activities. However, the conventional extraction methods frequently used to extract these compounds may have a negative impact on their preservation, mainly due the high temperature frequently used by these procedures. The use of some emerging extraction technologies such as high pressure and ohmic heating to extract bioactive compounds from plant materials is very recent, but some promising results are been reported. Moreover, these methods are green technologies that usually overcomes many of the limitations of conventional methods.

The main goals of this research was identify and quantify the phenolic compounds of prickly pear peel extracts when obtained by high pressure and ohmic heating assisted extractions, as well as to analyse the antimicrobial activity of the extracts against several food contaminants.

Regarding to phenolic compounds, all extraction conditions tested using high pressure and/ or ohmic heating allowed higher extraction yields than the obtained using Soxhlet extraction. Among the 18 compounds that were quantified, only 13 were identified, in which piscidic acid, citrate and eucomic acid were the most abundant compounds. The extracts originated inhibition halos between 7 and 10 mm for *B. Cereus*, *S. aureus* and *S. enteritidis*. Minimum inhibitory concentration found was of 125 mg/ml, except for *B. cereus* that was 62.5 mg/ml and the minimum bactericidal concentration was of 250 mg/ml for all microorganisms.

This work was supported by National Funds from FCT–Fundação para a Ciência e a Tecnologia through project PEst-OE/EQB/LA0016/2013 and by FCT/MEC by the financial support to the QOPNA research Unit (FCT UID/QUI/00062/2013), through national funds and where applicable co-financed by the FEDER, within the PT2020 Partnership Agreement. The authors Elisabete Alexandre and Marta Coelho also are grateful for the financial support from FCT through the Post-doctoral SFRH/BPD/95795/2013 and Doctoral SFRH/BD/111884/2015 Grants, respectively.

Improvement of antioxidant activity and microbial safety of carrot juice by application of a high-pressure pomegranate peel extract

João Trigo[1,2], Elisabete Alexandre[1,2], Sara Silva[2], Ana Oliveira[2], Jorge Saraiva[1], Manuela Pintado[2]

Affiliation: [1] Departamento de Química, Unidade de Investigação de Química Orgânica, Produtos Naturais e Agroalimentares (QOPNA, Universidade de Aveiro, Campus Universitário de Santiago, 3810-193 Aveiro, Portugal

[2] Centro de Biotecnologia e Química Fina (CBQF - Laboratório Associado, Escola Superior de Biotecnologia, Universidade Católica Portuguesa/Porto, Rua Arquiteto Lobão Vital, 4202-401 Porto, Portugal

Title: Improvement of antioxidant activity and microbial safety of carrot juice

Main domain: Food Industry

Presentation type: Poster

Keywords: antioxidant activity; carrot juice; pomegranate peel extract

Conventional extraction techniques may be employed to extract bioactive compounds from fruits by-products but the high temperatures usually used may result in several drawbacks when compared with emerging extraction technologies. Only recently, high-pressure have been used as extraction methodology to recover bioactive compounds. This technology presents important advantages when compared to conventional methods and its outputs are very promising.

The main goal of this research was to valorise pomegranate peel, through its incorporation in carrot juice. High-pressure extraction was performed to obtain a pomegranate peel extract, later added to juice that was pasteurized by high pressure and thermal treatments. The samples were analysed throughout storage time.

For total aerobic mesophiles and psychrophiles, fortified juices (2.5 mg/mL) showed lower counts ($p < 0.05$) than the non-fortified ones. Total antioxidant activity (assessed by FRAP, ABTS, and ORAC methods), had superior values ($p < 0.05$) in supplemented juices (2.5 mg/mL) during the 28 days of storage.

On the 28th day of storage, high-pressure samples exhibited lower counts for total aerobic mesophiles and psychrophiles in comparison to thermal samples ($p < 0.01$). Globally, high-pressure treatment had identical values to heat processing regarding antioxidant activity ($p > 0.05$).

These data suggest that when pomegranate peel extract (2.5 mg/mL) is added to high-pressure- or thermal-treated carrot juice it improves, over storage, the microbial safety as well as antioxidant activity.

This work was supported by National Funds from FCT–Fundação para a Ciência e a Tecnologia through CBQF (FCT UID/Multi/50016/2013) and QOPNA research Unit (FCT UID/QUI/00062/2013), through national funds and where applicable co-financed by the FEDER, within the PT2020 Partnership Agreement. Author Elisabete Maria Cruz Alexandre also is grateful for the financial support of this work from "Fundação para a Ciência e Tecnologia - FCT" through the Post-doctoral Grant SFRH/BPD/95795/2013.

Evaluation of the impact of high pressure on the microbiological load of a acorn beverage

João Costa[1]; Maria Vale[1]; Eduardo Costa[1]; Elisabete Alexandre[1,2]; Sara Silva[1]; Jorge Saraiva[2]; Manuela Pintado[1]

[1)] Centro de Biotecnologia e Química Fina - Laboratório Associado, Escola Superior de Biotecnologia, Universidade Católica Portuguesa/Porto, Rua Arquiteto Lobão Vital, 4202-401 Porto, Portugal
[2)] Department of Chemistry, Research Unit of Química Orgânica, Produtos Naturais e Agroalimentares (QOPNA), University of Aveiro, Campus Universitário de Santiago, 3810-193 Aveiro, Portugal.

Title: Impact of high pressure on microbiological load of acorn beverages **Main domain:** Food Industry

Presentation type: Poster
Keywords: High Pressure Processing; Surplus valorisation; Shelf life extension.

Acorns, while frequently regarded as animal feed, are actually a part of the gastronomical folklore of North America and the Mediterranean areas. This fruit is produced by Quercus trees that are widely distributed around the globe which means that it is widely available and, if one considers that most are left uncollected, acorns are not only a relatively low cost raw material but a potential new means to improve the value of this type of tree. Nutritional and functionally wise, acorns possess an interesting potential as they are rich in bioactive ingredients (like phenolic compounds and tocopherol), polyunsaturated fatty acids while being gluten free and possessing a relatively high protein content. Therefore, the production of an acorn based beverage may be of interest particularly when considering groups with specific nutritional needs such as celiacs. However, raw acorn beverages have a small shelf life mostly due to their intrinsically high nutritional content but also initial microbial load. Taking this into account, the present work aimed to evaluate the potential of a high pressure approach upon the microbiological load of a commercially available acorn beverage in an attempt to extend their shelf life (from a microbiological standpoint). Overall the results showed that high pressure could extend the shelf life of the acorn beverage for up to 28 days.

This work was supported by National Funds from FCT–Fundação para a Ciência e a Tecnologia through CBQF (FCT UID/Multi/50016/2013) and QOPNA research Unit (FCT UID/QUI/00062/2013), through national funds and where applicable co-financed by the FEDER, within the PT2020 Partnership Agreement. Author Elisabete Maria Cruz Alexandre also is grateful for the financial support of this work from “Fundação para a Ciência e Tecnologia - FCT” through the Post-doctoral Grant SFRH/BPD/95795/2013.

Chitosan films as a carrier of omega-3 loaded nanoemulsions: release behaviour of different food simulants

Authors: Ana I. Bourbon[1]*, Miguel A. Cerqueira[1], José A. Teixeira[2] and Lorenzo Pastrana[1]

Affiliation: [1]International Iberian Nanotechnology Laboratory, Department of Life Sciences, Av. Mestre José Veiga s/n 4715-330 Braga, Portugal.

[2] Centro de Engenharia Biológica, Universidade do Minho, Campus de Gualtar, 4710-057 Portugal, Braga

Main domain: Food Industry

Keywords: Active packaging, release mechanisms, encapsulation

Bio-based and biodegradable films loaded with active compounds can be used as an alternative to improve the shelf life of food products and add nutritional value to food. Omega-3 polyunsaturated fatty acids (ω-3) are known for their functional properties (e.g. improve cardiovascular health, improve cognitive function and decrease inflammation). However ω-3 is highly susceptible to oxidation which makes their direct application in foods extremely difficult. To improve its application in food products and protect against oxidation, nano-sized emulsions emerge as a viable alternative. Lactoferrin nanoemulsions containing ω-3 were incorporated in chitosan-based films and evaluated in terms of physic-chemical properties (water vapour permeability, solubility, scanning electron microscope, mechanical tests. Moreover, the release behaviour of ω- from chitosan films were studied in a lipophilic and hydrophilic release medium at 25 °C. Nanoemulsions containing ω-3 were produced with a high-pressure homogenization (5 cycles at 20000 psi) using 2% (w/w) of lactoferrin and 5 % (w/w) of ω-3. The average droplet size of nanoemulsions was around 200 nm and with a ζ-potential around 30 mV. Chitosan films with ω-3-loaded nanoemulsions exhibited a higher water vapour resistance, lower solubility and are more flexibility than chitosan films without the addition of nanoemulsions. The release of ω-3 was faster in lipophilic conditions (ethanol 50 % (v/v)) with a coefficient of diffusion (D) of 5.24 x 10^{-16} m^2/s when compared with hydrophilic released (ethanol 10 % (v/v)) with a D of 1.19 x 10^{-18} m^2/s (Fig. 1). Results obtained in the present work evidence the ability of to usechitosan films for the incorporation of ω-3 nanoemulsions foreseeing the application in foods aiming for improved t nutritional value.

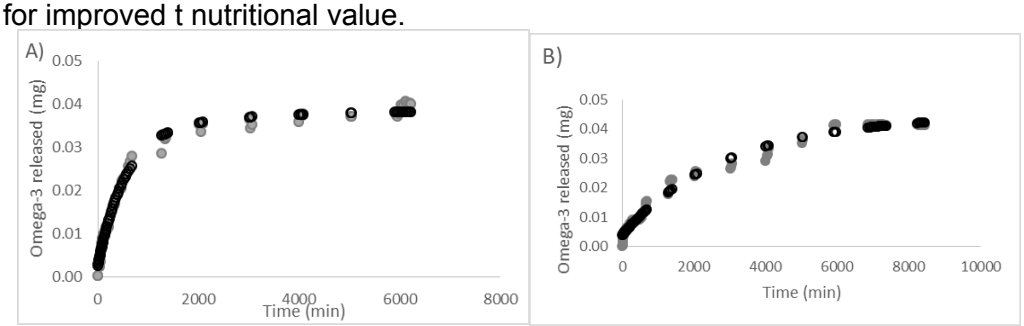

Fig. 1, Release profile of omega-3 through chitosan films at 10 v/v % (A) and 50 v/v % (B) alcohol; experimental data (•); Linear Superposition Model (i = 1) (○).

Acknowledgement

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Microfluidics for controlled self-assembly of cubosome nanoparticles of tuneable size

Authors: Celso J.O. Ferreira[1,2], Vahid Nasirimarekani[1,2], Cludia Botelho[1,2], M. Elisabete C.D. Real Oliveira[2], Bruno F.B. Silva[1]
[1] INL – International Iberian Nanotechnology Laboratory, Av. Mestre José Veiga, Braga 4715-330, Portugal. [2] University of Minho, CP, Campus of Gualtar, 4710-057 Braga, Portugal

Abstract Summary:

Cubosomes consist of dispersions of bicontinuous cubic liquid-crystalline phases composed of lipid and water and stabilized with a hydrophilic polymer. Compared to liposomes, these particles have a nanostructured interior with a higher fraction of lipid, being ideal to deliver bioactive hydrophobic molecules in health and food applications [1].

Cubosomes are typically prepared either by fragmenting the cubic liquid crystal in excess water using high energy input (e.g. ultra-sonication), or using solvent-shifting approaches, in which the lipid is first dissolved in a water-miscible solvent (typically ethanol), and later mixed with water and polymer stabilizer [2]. In both cases, poor experimental control at the micron- and nanoscales (e.g. poor control on concentration and heat gradients), limits the fine tuning of the particle properties and results in cubosomes with broad size distributions. In this work, we employ the solvent-exchange method using a microfluidic device [3], achieving rapid and controlled mixing at the micron-scale and obtaining cubosomes of tuneable size and low polydispersity.

The micron-sized channels in microfluidics lead to laminar flow regimes and enhanced experimental control. In this regime, hydrodynamic focusing can be used to decrease the mixing time between the different components, by decreasing the distances that molecules must travel for total mixing. An ethanol-lipid solution is flowed in a central inlet, which is squeezed by two side streams of water with stabilizer. As the lipid-ethanol solution narrows, ethanol and water are mixed in a controlled way by diffusion, leading to formation of cubosomes. By manipulating the flow rate ratio (FRR) between the two solutions we manipulate the width in which the hydrodynamic focusing occurs, influencing the assembly time in a homogeneous way. This way, by manipulating the FRR, we were able to tune the size of the cubosome nanoparticles. Nanoparticle size is a key parameter in drug delivery. Controlling cubosome size is therefore a relevant step towards the design of new and more efficient formulations.

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Nanoimaging of Nutrient Transporters

Authors: Cláudia Barata[1], Rosana Alves[1], Aline Marie Fernandes[2], Sandra Paiva[1] and Pieter De Beule[2]

Affiliation: [1]Centre of Molecular and Envrionmental Biology, University of Minho; [2]

Department of Life Sciences, International Iberian Nanotechnology Laboratory.

Title Nanoimaging of Nutrient Transporters
Main domain: Food Industry
Presentation type: Poster communication

Keywords: nutrient transporters, metal transporters, Fluorescence (fluctuation microscopy, atomic force microscopy

Plain abstract summary

Membrane nutrient and metal transporters function as gateways for all live significant compounds, including drugs. These transporters are relevant for the survival of our cells but also for biotechnological processes, when microorganisms are used as cell factories. Transporters play important roles in food industry (e.g. for the production of food additives, biopolymers and in the pharmaceutical industry (e.g import of drugs. On the other hand, they are also the entrance point of certain food and environmental contaminants and additives that contain for example metals.

We are interested in detailing the molecular functioning of signaling networks applied by cells. In particular, we study monocarboxylate and copper transporters with different nano-imaging modalities. We believe that the nanoimaging techniques applied can have a wider application area in food research.

Firstly, using a combination of atomic force microscopy and fluorescence optical sectioning microscopy we aim to perform a real-time observation of single receptor signaling dynamics coupled with the downstream intracellular signaling response. Here, we detail an imaging system unique to the INL capable of acquiring simultaneous information.

Secondly, we apply nanoimaging based on fluorescence fluctuation dynamics to study the membrane dynamics of trimer formation required for the constitution of a copper transfer pore. To this end, we detail how the number and brightness technique works.

Isolation, Characterization and Selection of Autochthonous Lactic Acid Bacteria from raw cow's milk cheeses (Tetilla for use as starter cultures

Authors: Cristian Bolaño[1], Sofia Rosendo[1], Maikel Fernñndez[2], Mercedes Alonso[3], Mª José Chapela[3], Paula Fajardo[3]

Title Autochthonous Bacteria from cheeses for use as starter cultures **Main domain:** Food Industry
Presentation type: Poster

Keywords: cheese, starter, Tetilla
Plain abstract summary (narrative text maximum 350words

Nowadays, most of the cheese factories use both pasteurized milk and lyophilized starter cultures for a direct inoculation in the cheese manufacturing, known as DVS (Direct-to-vat set. This practice provides benefits such as increased microbiological control, homogeneity between batches or the combination of strains for an optimal fermentation and virus resistance but it limits the organoleptic characteristics of the product. However, with raw milk, cheese fermenting and ripening activities are carried out by native microbiota that gives typical organoleptic features to the cheese, often much appreciated by the consumers.

Therefore, the present study aims to isolate and characterize suitable starter cultures for the production of a differentiated product with the same level of safety as commercial DVS.

A total of 113 lactic acid bacteria were obtained from the predominant microflora of 21 short-ripened starter-free raw cow's milk cheeses (Tetilla made in Galicia (NW Spain and further characterized on the basis of their morphological and biochemical characteristics. 36 strains were subjected to identification tests based on morphology, biochemical and genetic analysis (for 17 of them and subsequently to milk acidification, salt tolerance, protease activity, antagonism against pathogens, detection of bacteriocins and milk coagulation proofs. As a main criterion, the acidifying capacity was used, selecting strains capable of lowering the pH of the milk to <5.3 inoculating 2% (v / v milk and incubating at 30 ° C and 37 ° C. These results allowed the selection of 11 strains as good candidates for use as starter cultures for cheese manufacture. Future studies will be focused on the combination of strains, production and organoleptic characterization of cheeses produced with these starters and the feasibility of nanoencapsulation of these cultures for long-term storage.

Extraction of polyphenols from blackcurrant pomace by a floatation method and with food grade surfactants

Authors: Gokhan Durmaz and Paula Jauregi
Affiliation: Department of Food and Nutritional Sciences, The University of Reading, UK

Title: Extraction of polyphenols from blackcurrant pomace by a floatation method and with food grade surfactants

Main domain: Food Industry
Presentation type: Talk or Poster
Keywords (3): polyphenols, blackcurrant pomace, floatation method

Plain abstract summary:

Blackcurrant (Ribes nigrum) is known as “superfruit” due to its health benefits. This is mainly because of its content in antioxidant compounds such as anthocyanins. The waste generated during blackcurrant juice production is known to contain significant amount of anthocyanins. Thus the extraction of those valuable phytochemicals from the waste material is important.

In this study the bioactive compounds of blackcurrant waste were extracted first by hydroalcoholic extraction and then by applying colloidal gas aphrons (CGA). CGA are microbubbles obtained by intense agitation of a surfactant solution over the critical micelle concentration. By using CGAs, polyphenols were floated and predominantly separated into the aphron phase (AP) from the bulk liquid phase (LP). Both phases were analysed for total phenolic content, total monomeric anthocyanins, total protein content and antioxidant potential. Here, for the first time, whey was used as surfactant in CGA production and compared with tween-20 which is a synthetic non-ionic surfactant. Different concentrations of whey were used in CGA production and gas-holdup and foam stability were determined as the main characteristics of CGA. Optimum concentration of whey was found to be 10 mg/ml in CGA production which provides nearly 60% gas hold-up and half-life 600 s; these characteristics were comparable to those obtained with Tween 20 (10 mM) although the stability of Tween 20 CGA was lower (half-life 407 s). CGA were applied in batch mode to the liquid raw extract within the flotation column. More than 55% of anthocyanins were recovered in a single step at feed to CGA rate 1:11; these recovery rates were relatively lower compared to those with Tween-20 (76%).

Enzymatic Hydrolysis of Edible Insect Protein and Its Antioxidant Potential

Authors: Pedro Sousa, Sandra Borges, Manuela Pintado

Affiliation: CBQF - Centro de Biotecnologia e Química Fina - Laboratório Associado, Escola Superior de Biotecnologia, Universidade Católica Portuguesa, Porto, Portugal.

Title Enzymatic Hydrolysis of Edible Insect Protein and Its Antioxidant Potential
Main domain: Food Industry
Presentation type: Poster
Keywords: Insect, Hydrolysates, Antioxidant

The consumption of insects is already done worldwide by at least 2 billion people and there are more than 1900 species of edible insects described in literature [1]. Due to the high protein value of insects, around 60% [2], many studies have been done to develop hydrolysates with various biological properties, such as antioxidant [3] and antihypertensive [4]. These peptides are usually obtained through the enzymatic hydrolysis by commercial enzymes, proteases or by SGID. This work aimed to hydrolyse proteins from *Alphitobius diaperinus* and evaluate its bioactivity. An enzymatic hydrolysis process was done, using Alcalase™ 2.5L and Corolase PP at an enzyme:substrate ratio (E/S) of 0.5%, 1.5% and 3.0% during 24 hours. It was evaluated the degree of hydrolysis (DH) at different sampling times and the antioxidant activity at 4 and 6 hours of hydrolysis time. It was observed that the DH reached maximum values after 4 hours or 6 hours of hydrolysis. Using Alcalase™ 2.5L, DH oscillated between 20.5-25.0% and 26.7-28.4%, using Corolase PP, the DH values varied between 9.3-32.1% and 13.2-35.1%, for the 4 hours and 6 hours of hydrolysis time, respectively. The highest ABTS scavenging radical activity obtained for Alcalase™ 2.5L hydrolysates (AH) and Corolase PP hydrolysates (CH) was the condition 3.0% (E/S) at 6 hours, 4.0 and 4.9 µmol TE/mL of sample, respectively. Using ORAC method, the highest value of antioxidant activity for AH was obtained by the condition 1.5% (E/S) at 4 hours (9.3 µmol TE/mL of sample). For CH, the highest value was obtained by condition 3.0% (E/S) at 6 hours (12.9 µmol TE/mL of sample). Therefore, protein hydrolysis of insects can be a feasible way to obtain extracts with a wide functionality and bioactivity for the food and feed industries.

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Impact of an anthocyanin rich blueberry extract upon *Lactobacillus* and *Bifidobacterium* adhesion to a CaCo-2 and HT29-MTX cell line

Author(s: M. Veiga[1], E.M. Costa[1], P. Batista[1], S. Silva[1] and M.M. Pintado[1]

Affiliation: 1 CBQF - Centro de Biotecnologia e Química Fina - Laboratório Associado, Escola Superior de Biotecnologia, Universidade Católica Portuguesa

Main domain: Food Industry
Presentation type: Poster
Keywords: probiotics, blueberry extract, anthocyanins, Caco-2

Plain abstract summary

Background
Blueberries have been associated with several potentially beneficial properties including antioxidant and anti-inflammatory activity and, more recently, they have been associated with the modulation of the intestinal microbiota. Previous works have shown that an anthocyanin rich blueberry extract, when in contact with certain bifidobacteria, was capable of inhibiting the adhesion of potential pathogens to a mucin coated surface, which mimicked the intestinal epithelium. As such, this work aimed to assess whether a blueberry extract was capable of modulating the adhesion of different probiotic bacteria to CaCo-2 and HT29-MTX cells.
Methods
Briefly, a 48 h inoculum of *L. rhamnosus* R11 and *B. animalis* subsp. *lactis* BB12 were made and diluted to a density equivalent to $1x10^5$ log CFU in PBS. Aliquots of 100 µL of a cell suspension ($1x10^5$ cells mL^{-1}) were seeded in 96 well microplates and after 24 h incubation, the medium was replaced with either mix of medium and bacteria, mix of medium, extract (500 mg mL^{-1}) and bacteria or mix of medium, FOS (3 % v v^{-1}) and bacteria, with five replicates for each condition. The mixture was left in contact with the cells for 15, 30, 60, 120 and 180 minutes at 37 °C. After these periods, total viable counts were determined using decimal dilutions which were plated in quadruplicate in MRS agar supplemented with 0.02% bromophenol blue. The plates were then incubated for 48 h at 37 °C under anaerobic conditions.
Results and Conclusion
Results demonstrated that the extract contributed to higher adhesion values than both the positive control and FOS, with *Bifidobacterium* showcasing overall higher adhesion values than *Lactobacillus.* Additionally, comparing the results for both cell lines, it was seen that the adhesion values ranged among the same percentages, even though for Caco-2 a higher relative adhesion was observed in the presence of extract (with percentages reaching 95% of relative adhesion). Even though more studies are necessary to further evaluate these adhesion processes and ascertain to the differences between adhesion mechanisms, the tested extract showed potential to modulate probiotic adhesion.

Acknowledgements
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Surfactant&Enzyme Assisted Extraction of Phenolic Compounds from Grape Marc

Authors: Cecilia Fiorentini1, Gokhan Durmaz2,3, Paula Jauregi2, Giorgia Spigno1

Affiliation: [1] DiSTAS, Department for Sustainable Food Process Faculty of Agricultural, Food and Environmental Sciences, Università Cattolica del Sacro Cuore, Italy.

[2] Department of Food & Nutritional Sciences, The University of Reading, United Kingdom.

[3] Inonu University, Department of Food Engineering, Malatya, Turkey.

Main domain: Food Industry
Presentation type: Poster

Plain abstract summary

Grape marc is an important residue generated in huge amounts (up to 50% weight of processed grape) during wine making. Grape marc and in particular the grape skin, is a good source of phenolic compounds especially anthocyanins in the case of red grape. In this study, phenolic compounds were extracted from red grape skins by using five different solvent systems: 60 % ethanol, water, water with a mixture of three enzyme commercial preparations dosed each at 1 % wt on skins dry weight (Lafase He Grand CRU, Celluclast, Lafase XL Extraction), water plus Tween-20 and water-enzyme plus Tween-20. Extracts were obtained after a 1 h extraction at 50°C under stirring and the obtained extracts were analysed for total phenolics, total monomeric anthocyanins and antioxidant capacity. The extraction was performed by using either 60% ethanol or water. The enzymes combination was selected after previous tests and to exploit different activities on cell wall components. Tween-20, a food-grade synthetic surfactant, was used to evaluate its effectiveness to increase the extraction yield. According to our results, it is quite clear that hydroalcoholic extraction is the best among tested solvents for recovery of phenolics. On the other hand, addition of enzymes to water caused a clear increase in phenolic/ anthocyanin content and antioxidant activity. This increase was probably the result of partial decomposition of structural carbohydrates such as pectin and cellulose which facilitates the release of bound phenolic compounds. The presence of Tween-20 affected the measured parameters in different ways. In fact, it caused a decrease in total phenolics and antioxidant capacity but an increase in total anthocyanin content. Increase in the extractability of anthocyanins is probably due to the higher solubility of those compounds in water in the presence of a surfactant. The decrease in the extractability of total phenolics might be due to hydrophobic interactions of some phenolics with the surfactant which may hinder the reduction of the Folin's reagent used for their quantification.

Antioxidant peptides obtained from animal by-products: stability throughout gastrointestinal tract

Authors: Sandra Borges[1], Joana Odila[1], Glenise Voss[1], Rui Martins[2], Ana Rosa[2], Wouter Vanderpoorten[2], André Almeida[2], Manuela Pintado[1]

Affiliation: [1] CBQF - Centro de Biotecnologia e Química Fina - Laboratório Associado, Escola Superior de Biotecnologia, Universidade Católica Portuguesa, Porto, Portugal

[2] ETSA, Empresa Transformadora de Subprodutos, Loures, Portugal

Title Antioxidant peptides obtained from animal by-products: stability throughout gastrointestinal tract

Main domain: Food Industry

Presentation type: Poster

Keywords: Bioactivity, By-products, Peptides

Plain abstract summary

Reactive oxygen species and reactive nitrogen species are free radicals that have a vital role in the body (e.g. host defense against invading pathogens), however an imbalance between free radical production and endogenous antioxidant defense may cause cellular oxidative stress. Oxidative damage has been related to cause several pathologies, such as heart diseases, stroke, arteriosclerosis, diabetes and cancer. Dietary intake of antioxidants could be a strategy to prevent these diseases [1, 2]. Antioxidants can directly scavenge free radicals or inhibit free radical production by chelating metal ions. Enzymatic hydrolysis under ideal conditions is the most effective and reliable way for releasing antioxidant from food proteins [3].

This work aimed to hydrolyze proteins obtained from by-products such as meat/bones, fish/bones and blood (fresh blood and blood cell fraction), and also to evaluate their bioactivity and bioavailability. It was determine the antioxidant activity (ABTS, DPPH and ORAC methods) of peptide extracts and their stability were assessed throughout simulated gastrointestinal tract. The hydrolysis was performed using alcalase (a commercial enzyme) and the ideal conditions for each animal by-product, namely enzyme/substrate ratio and hydrolysis time was selected. All protein hydrolysates demonstrated antioxidant potential, ca. 9.2-14.1 mg ascorbic acid equivalent/g sample (ABTS method); 3.3-4.9 mg Trolox equivalent/g sample (DPPH method) and 116.5-180.2 Trolox equivalent/g sample (ORAC method). Protein hydrolysates maintained their bioactivity after the *in vitro* simulation of the gastrointestinal tract.

This study proves the ability of proteins of different animal by-products to generate bioactive peptides, demonstrating that its functionality is preserved during gastrointestinal tract.

This work was supported by National Funds from project MOREPEP (POCI-01-0247-FEDER-017638), funded by Fundo Europeu de Desenvolvimento Regional (FEDER), under Programa Operacional Competitividade e Internacionalização (POCI). We would also to thank the scientific collaboration of CBQF under the FCT project UID/Multi/50016/2013.

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Development of chitosan and codfish hydroxyapatite pastes to evade prosthetic joint infections

Authors: Ana R. Costa-Pinto[1]*, Ana L. Lemos[1], Clara Piccirillo[2], Freni K. Tavaria [1], Manuela E. Pintado[1]

Affiliation: [1]Universidade Católica Portuguesa, CBQF - Centro de Biotecnologia e Química Fina – Laboratório Associado, Escola Superior de Biotecnologia, Rua Arquiteto Lobão Vital, 172, 4200-374 Porto, Portugal

[2]Institute of Nanotechnology, National Research Council, Lecce, Italy

Title: Development of chitosan-codfish hydroxyapatite pastes to evade prosthetic joint infections **Main domain:** Indstria da alimentação, Recuperação de subprodutos e resíduos
Presentation type: Poster communication
Keywords: Codfish, Hydroxyapatite, Chitosan

Plain abstract summary

Periprosthetic joint infection (PJI is one of the most serious complications after orthopedic surgery and a critical mechanism of failure, which leads to complex revision procedures. Only a small number of microorganisms are needed to infect the implant, resulting in the formation of a biofilm on its surface. Once infection is established, it is required to remove and replace the infected prosthesis. Standard treatments include the removal of the implant, but also the removal of necrotic bone pieces, local and/or systemic administration of antibiotics, and also a revision arthroplasty with a new prosthesis, once infection is eradicated. Therefore, a great need for an effective strategy that can simultaneously eradicate infection and promote new bone formation.

Chitosan is a natural origin biomaterial with great potential for biomedical applications [1]. Special interest regarding this material is given for this application due to its antimicrobial [2] and osteogenic properties [3]. Regarding to its antimicrobial activity, chitosan has a broad spectrum, to which Gram-negative, Gram-positive bacteria and fungi are highly susceptible [2]. Hydroxyapatite (HAp is still considered the most osteoinductive and osteoconductive material in nature and it can be extracted from natural sources such as fish bones, which are byproducts of fish industry [4]. Recent work showed that it was possible to extract HAp based materials from Atlantic codfish bones with similar biocompatibility to commercial products [4] Chitosan medical grade and hydroxyapatite (HAp obtained from Atlantic codfish bones in the form of pastes were produced to be further used in titanium prosthetic joints, combining the antimicrobial properties of chitosan and osteogenic ability of HAp. The pastes were shown to evaluate their antimicrobial potential with relevant microorganisms, considered to be the main infectious agents in PJI scenarios.

Acknowledgements: Biotherapies- Bioengineered Therapies for Infectious Diseases and Tissue Regeneration", funded by Norte2020.

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WATER RESOURCES ABSTRACTS

Production of defined molecular weight chondroitin sulfate of marine origin by enzymatic hydrolysis

Authors: Jesus Valcarcel, Míriam R. García, Lucía F. Sampayo, José Antonio Vázquez
Affiliation name: Marine Research Institute (CSIC)

Title: Production of defined molecular weight chondroitin sulfate of marine origin by enzymatic hydrolysis

Main domain: Food Industry
Presentation type: Poster
Keywords: Chondroitin sulfate, hyaluronidase, chondroitinase

Summary

Sulfation pattern and molecular weight (Mw) of chondroitin sulfate (CS) seems to influence its bioactivity and related therapeutic properties [1]; hence modification of these characteristics appears attractive to tailor CS to particular applications. Besides characteristic sulfation, CS from marine sources displays higher Mw than terrestrial counterparts [2], making it more amenable to produce CS with a wider range of Mw. In the present work we study the depolimerization of CS from ray, chimaera and shark by enzymatic hydrolysis with hyaluronidase and chondroitinase ABC. Decrease in Mw is followed at four levels of enzyme to substrate ratio by size exclusion chromatography with light scattering detection. Fitting of experimental data to empirical equations allows to establish conditions of reaction to produce CS of defined Mw.

Acknowledgements

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Development of an electrochemical sensor based on MIP-QDs for assessing cocaine and metabolites

Authors: Juan Sánchez-González[a], Maria Del Pilar Bermejo Barrera[a], António Moreda-Piñeiro[a], Begoña Espiña[b], Raquel Queirós[b,*]
Affiliation: [a] Universidad Santiago de Compostela; [b] International Iberian Nanotechnology Laboratory

Title Development of an electrochemical sensor based on MIP-QDs for assessing cocaine and metabolites
Main domain: Water Resources
Presentation type: Poster
Keywords: Biosensor, Cocaine, Molecular Imprinted Polymers

Plain abstract summary

The market for new psychoactive substances (NPSs) continues to grow exponentially, as well as the drugs available. New synthetic cannabinoids (SCs) are one of the most reported NPSs identified [1]. Some parts of the molecular structure of these SCs are common to the drugs obtained from natural products which causes that these new substances exhibit similar or even higher psychoactive power then substances of natural origin. These new substances have some structural differences when compared to natural drugs and may go unnoticed during the control of illicit drug market and also during routine toxicological-forensic analysis. Therefore, highly sensitive methods for the detection of these substances are still needed.

In this work, molecularly imprinted polymers (MIPs) [2], Mn-doped-ZnS quantum dots (QDs) and MIP-QDs [3], previously prepared for the recognition/pre-concentration of cocaine and their metabolites, were characterized by different techniques as physicochemical, optical spectroscopy and electron microscopy and then integrated onto electrochemical sensors for cocaine detection in water samples.

MIPs were incorporated into a 3,4-ethylenedioxythiophene-based polymer mixture, as support polymer to improve the MIPs anchorage onto electrode surface, being after electropolymerized on the surface of gold electrodes.

After the optimization of the electropolymerization conditions, the analytical behaviour of the sensors, against cocaine, was evaluated using different electrochemical techniques such as cyclic voltammetry. The increase of cocaine concentration generated a decrease in electrical signal and its displacement throughout the interaction time. A limit of detection of 0.27 mM (n=3) was found and a dynamic range between 2.0 and 10.0 mM.

The final goal of this work is to apply these MIP-based electrochemical sensors, for cocaine detection, to the analysis of environmental water samples.

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Ethereal Guardians: *in silico* evaluation and water quality

Authors: Ana S. Moura [1], M. Natália D.S.Cordeiro [1]
Affiliation: [1]LAQV@REQUIMTE, Department of Chemistry and Biochemistry, University of Porto

Title: Ethereal Guardians: *in silico* evaluation and water quality
Main domain: Water Resources
Presentation type: Poster
Keywords: ecotoxicity; monitoring systems; QSAR/QSTR

Abstract Summary:

The toxicity prediction on nanoparticles in ecosystems and their sustainable use in areas such aquaculture or agriculture requires large experimental batteries of assays, due to the array of descriptors to assess. However, the experimental assessment of descriptors such as composition or surface charge, is not only time consuming but also bearer of high economic costs. In recent years, several *in silico* models were developed which seemingly meet the needs of short time results, high efficiency in toxicity prediction and low economic costs that are sought by industry and researchers alike. This work reviews several aspects of the development of a novels and feasible quantitative structure-activity/toxicity relationships (QSAR/QSTR) models for prediction of ecotoxicity in a wide range of ecosystems, including aqueous [1-3].

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Cost-efficient chip for the detection of biotoxins inhibiting protein phosphatases

Authors: Ana Castanheira, Marília Santos, Laura Rodriguez, Raquel Queirós, Begoña Espiña

Affiliation: INL - International Iberian Nanotechnology Laboratory Avenida Mestre José Veiga s/n, 4715-330 Braga, Portugal

Title: Cost-efficient chip for the detection of biotoxins inhibiting protein phosphatases **Main domain:** Water Resources
Presentation type: Poster

Keywords: biotoxins detection; protein phosphatase

S**ummary**

Harmful Algal Blooms (HABs) is one of the most important sources of contamination in the sea and freshwaters that can produce high concentrations of potentially harmful biotoxins [1]. The analytical methods for the detection of biotoxins usually involve liquid chromatography coupled to mass spectrometry (LC-MS) but the chromatographic techniques are very expensive, time consuming and require skilled persons to operate [2]. Bio-analytical methods can be very promising and powerful tools for the detection of a variety of biotoxins. Enzyme-linked immunosorbent assays (ELISA) show high specificity but do not provide information about the toxicity of biotoxins. Enzymatic methods based on the protein phosphatase (PP) inhibition can inform about the toxicology and are highly sensitive [3]. Biosensors for the detection of PP inhibition had been successfully demonstrated for different biotoxins: okadaic acid [4] and microcystin [5]. However, the cost associated for the biosensor build-up and the fast enzyme inactivation when not stored under specific conditions, makes the commercial exploitation very difficult. In this work, we will develop a cost-efficient chip for the detection of biotoxins inhibiting protein phosphatases. The reusability of the chip will be possible because the detection strategy is based on the reversible inhibition of protein phosphatase 1 (PP1). PP1 will be introduced on the micro-chambers made of poly (methyl methacrylate) (PMMA) polymer and polydimethylsiloxane (PDMS), following two strategies that could enable the protein stability: (i) entrapment of PP1 on a sol-gel matrix and (ii) encapsulation of PP1 in polydopamine (PDA)/ poly(allylamide hydrochloride) (PAH) microparticles. Colorimetric assays were performed to study the PP1 immobilization efficiency using an appropriate enzyme substrate (4-Nitrophenyl Phosphate, 4NPP). The incorporation of PP1 both in the sol-gel and in the microparticles was optimized and its reusability was evaluated. Preliminary results showed an effective immobilization of PP1 on the chamber using the entrapment on a sol-gel matrix strategy (I).

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Dispersive liquid-liquid microextraction and ICP-OES to determine TiO_2 nanoparticles in water samples

Authors: Eva Castro-Villar, Antonio Moreda-Piñeiro, Manuel Aboal-Somoza*, Pilar Bermejo-Barrera

Affiliation: Group of Trace Elements, Speciation and Spectroscopy (GETEE), Department of Analytical Chemistry, Nutrition and Bromatology, Faculty of Chemistry, University of Santiago de Compostela, E-15782-Santiago de Compostela (La Coruña), Spain

Title (limit to 10 words)**:** Dispersive liquid-liquid microextraction and ICP-OES to determine TiO_2 nanoparticles in waters

Main domain: Water resources

Presentation type: Poster

Keywords: Nanometrology, DLLME, TiO_2 nanoparticles

Plain abstract summary (narrative text maximum 350 words)**:**

Titanium dioxide nanoparticles (TiO_2 NPs) are nowadays used in the textile, food and medical industries, and also in many personal care products and sunscreens because their whitening and UV diffraction properties. The widespread use of nanoparticles, and their presence in the environment, is a subject of discussion due to their possible toxicity to living organisms.

The current study deals to the development of an analytical method for isolating and determining TiO_2 NPs in water by dispersive liquid-liquid microextraction (DLLME) as an extraction technique, and inductively coupled plasma – optical emission spectrometry (ICP-OES) as an instrumental technique.

Variables inherent to the DLLME procedure have been optimized, and the developed method has been validated and applied to well water and hot spring water samples.

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Removal of contaminants using magnetic composite beads

Authors: L. Alves, S. Yáñez-Vilar, Y. Piñero, J. Rivas

Affiliation: Applied Physics Depts., Lab of Nanotechnology and Magnetism (NANOMAG), Technological Research Institute, University of Santiago de Compostela, E-15782, Santiago de Compostela, Spain

Main domain: Water Resources

Keywords: Nanomaterials, toxins, heavy-metals

Magnetic composite beads are a new class of materials, with diverse practical applications. Their substantial macroscopic size and magnetic properties, allows an easy handling and recovery by their instant action to an external magnetic field. Also, the facile synthesis is economically cost-effective for industrial scale production.

These materials are based on polysaccharides extracted from algae and plants, which are preferred over other compounds because of its natural origin, hydrophilic properties, abundance and presence of binding sites. Therefore, the combination of both magnetic nanoparticles and polysaccharides result in one of the cost-effective macroscopic nanocomposites able to absorb metal ions, organic compounds and other water contaminants [1] that pose a serious threat to public health because of the persistence, biomagnification and accumulation in food chain [2]. The sensitivity of these beads to a magnetic field is provided by magnetic nano- or microparticles incorporated into the beads. Moreover, aluminium silicates, activated carbon and other compounds can be entrapped to increase the absorption and cleaning capacities of these materials.

Their applicability for environmental remediation is a new tool in development stage, having as advantage in comparison with traditional sorbents, a large surface area allowing the entrapment of several reactive components and facile magnetic separation. Thus in this study, absorption experiments of heavy metals were performed with magnetic alginate beads of various coatings, to prove the efficacy of these nanomaterials to remove broad pollutants in water.

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The use of magnetic nanocomposites for the elimination of mycotoxins and fluoride from aqueous media

M. González-Gómez[1], S. Yáñez-Vilar[1], L. Alves[1], Z. Vargas[1], Y. Piñeiro[1], J. M. González-Jartín[2], I. Rodríguez[2], A. Alfonso[2], M. J. Sainz[3], L. M. Botana[2], J. Rivas[1]

[1] Departamento de Física Aplicada, Universidad de Santiago de Compostela, Facultad de Física, 15782, Santiago de Compostela, Spain

[2] Departamento de Farmacología, Universidad de Santiago de Compostela, Facultad de Veterinaria, 27002, Lugo, Spain,

[3] Departamento de Producción Vegetal, Universidad de Santiago de Compostela, Facultad de Veterinaria, 27002, Lugo, Spain.

Main domain: Water Resources
Keyword: magnetic nanocomposites, mycotoxins, fluorosis

Mycotoxins are a large group of secondary metabolic products from fungi, or molds, which cause serious health problems in humans, animals and agricultural products. Currently, more than 300 mycotoxins have been identified, and scientific attention is focused mainly on the mycotoxins that have proven carcinogenic and/or toxic. Thus, aflatoxins, zearalenone and deoxynivalenol elicit great public health concerns due to their high prevalence, and their teratogenic, carcinogenic, mutagenic and immunosuppressive effects [1,2].

Mycotoxin contamination occurs widely in foods, feedstuffs and water. Therefore, the inactivation, elimination or degradation of mycotoxins in contaminated foods, feedstuffs and water is a major global concern. Thus, strategies to eliminate or inactivate mycotoxins are urgently needed.

Numerous traditional physical and chemical strategies for the elimination or inactivation of mycotoxins have been reported in the literature [3]. Nevertheless, these methods have some limitations such as limited efficacy, safety issues, as well as the expensive equipment required to implement these techniques.

In recent years, using mycotoxin-adsorbing agents, to bind mycotoxins, shows a promising potential. However, there are various kinds of adsorption agents and their efficacy in preventing mycotoxicosis varies [4].

In the present work, we have designed different magnetic nanocomposites for the adsorption of different mycotoxins and fluoride in water, as low-cost adsorbents and efficient treatment technology for removal contaminants in water.

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Magnetic covalent organic framework for the adsorption of marine phycotoxins

Vanesa Romero,[1,2] Soraia P. S. Fernandes,[1] Laura M. Salonen,[1] Begoña Espiña[1]

[1] INL – International Iberian Nanotechnology Laboratory, Portugal
[2] Department of Analytical and Food Chemistry, Chemistry Faculty, University of Vigo, Spain

Main domain: Water Resources

Presentation type: Oral communication

Keywords: Magnetic covalent organic framework, Solid-phase extraction, Marine Phycotoxins

Marine phycotoxins, compounds produced by some marine microalgal species, are especially dangerous to human health since they can be concentrated in the digestive glands of seafood entering to food chain.[1] In order to generate an early warning system to alert for approaching toxic outbreaks, it is crucial to improve sample monitoring methods of phycotoxins, such as okadaic acid (OA) or DTX-1, in aquatic ecosystems. However, even during a harmful algal bloom (HAB), very low concentrations of okadaic acid and DTX-1 can be found in the aquatic ecosystems.[2] Commercial polymeric resins, such HP-20 or SP700, have not been able to provide an efficient HAB prediction system due to their low adsorption capabilities.[3] Adsorption on high-binding sorbents, such as crystalline porous covalent organic frameworks (COFs), allow at the same time the isolation and pre-concentration of the target compound.[4] Herein, we present a novel magnetic COF based on the grafting of TpBD-Me_2 onto the surface of functionalized Fe_3O_4 NPs. We demonstrated that equilibrium for adsorption of OA and DTX-1 can be reached in only 60 min, with a calculated maximum adsorption capacity (q_m) 500-fold improved compared to resin-based adsorbents. Additionally, nearly quantitatively desorption efficiency of both biotoxins was obtained, showing the recyclability with minor losses in adsorption capacity. The obtained efficient removal of marine phycotoxins as well as the possibility of regenerating the adsorbent broaden the potential applications of COFs to environmental monitoring of other worldwide concerning pollutants.

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Design of supported gold nanostars/TiO_2composite for near infrared-light-driven photocatalysis.

Laura Rodriguez-Lorenzo[1], Marília Santos[1], Begoña Espiña[1]
[1]INL - International Iberian Nanotechnology Laboratory, Avenida Mestre José Veiga s/n 4715-330 Braga, Portugal

Titanium oxide nanoparticles (nanoTiO_2) photocatalysis has received significant attention as a promising nano-enabled water treatment technologies.[1] However, its application is constrained mainly by low photocatalytic efficiency of nanoTiO_2 and limited visible and nea-infrared (NIR) photoabsorption.The recent and rapid development of surface plasmon resonance has offered a new opportunity to overcome the limited efficiency of these catalysts. Incorporating plasmonic nanoparticles into TiO_2 can enhances photocatalytic activity toward organic compound degradation[2] and water splitting.[3] For this, we designed and fabricated supported nanoTiO_2 decoared with gold nanostars, which provided the necessary visible-NIR-driven photocatalytic activity. We reported an excellent visible-NIR-induced degradation of rhodamine 101 by our supported photocatalyst integrated in a millifluidic device.

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Yessotoxin-loaded liposomes as microalgae-derived nanovehicles targeting cancer

Authors: Ana Vieira[1,2], Ivo Lopes[2], Andreia Gomes[2], Begoña Espiña[1], Marisa P Sárria[1]

Affiliation:
[1]INL - International Iberian Nanotechnology Laboratory, Braga, Portugal
[2] University of Minho, Braga, Portugal

Author contact information: Marisa P Sárria marisa.passos@inl.int

Title: Yessotoxin-loaded liposomes as microalgae-derived nanovehicles targeting cancer

Main domain: Water Resources

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Keywords: yessotoxin, targeted liposomes, anticancer agents

Abstract

It is common to hear that “less is more”, and combining it with “size does not matter”, it may fit perfectly as be talking about microalgae. With only a few micrometers, in optimal conditions, microalgae are one of the main organisms responsible for much of the oxygen produced and indispensable for most live forms. Furthermore, these are the basis of most food chains and a high source of important biomolecules with applicability in the environmental, medicinal and biotechnology fields.

However, in unbalanced environmental conditions as nutrients excess, uncontrolled proliferation of microalgae can occur, the so called blooms. As a consequence of the high content of organic matter accumulated, bacteria densities tend to increase, leading to critical reduction of oxygen levels on site. If a toxicogenic species of microalgae is present at the bloom occurrence, several toxins may be released, such is the case of a bloom of the dinoflagellate *Protoceratium reticulatum* producing yessotoxins (YTxs), a group of lipophilic polyethers having affinity to phosphodiesterases, affecting calcium levels and sharing a functional link with mitochondria and A-kinase anchor proteins [1,3]. Despite it is integrated in Diarrheic Shellfish Poisoning (DSP) group, it is at the cardiac and neurological levels that YTxs exert high toxicity. Apart from that, YTxs potential anticancer properties were further reported [2,3].

Several studies highlight the potential of natural-derived compounds as candidates for biomedical applications given their pharmacological and biocompatible properties [4]. In general, the marine pharmaceutical pipeline remains very active. Yet, the momentum to deliver additional compounds to the near future implies tunable solutions to control their native cytotoxic potential and lack of *in vivo* bioactivity at sub-toxic concentrations. Thus, in this work, taking advantage of targeted stealth pH-sensitive liposomes as highly competent and biocompatible delivery nanosolutions, YTxs were loaded and investigated as therapeutical agents towards breast (MCF-7) and prostate (PC-3) cancer cells (**Figure 1**). Cellular metabolic activity was measured as an indicator of *in vitro* cytotoxicity. YTxs cellular uptake was further tracked via fluo-labeled liposomes. Zebrafish embryotoxicity test (ZET) was applied to assess the developed

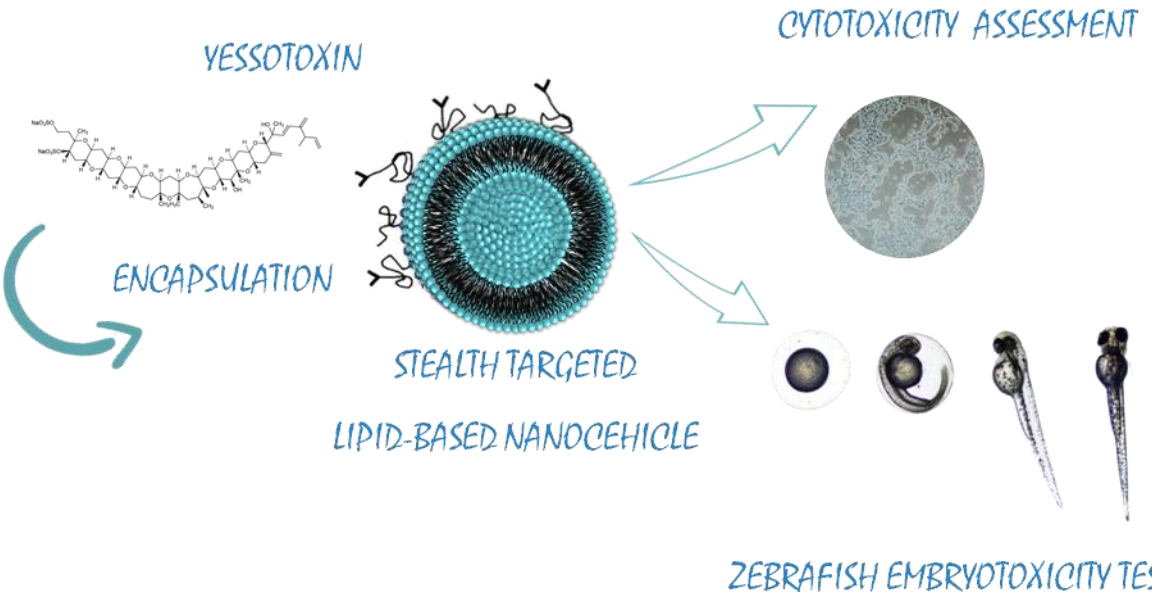

Figure 1: Systematic validation of YTx-loaded liposomes as effective nanoagents towards cancer.

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