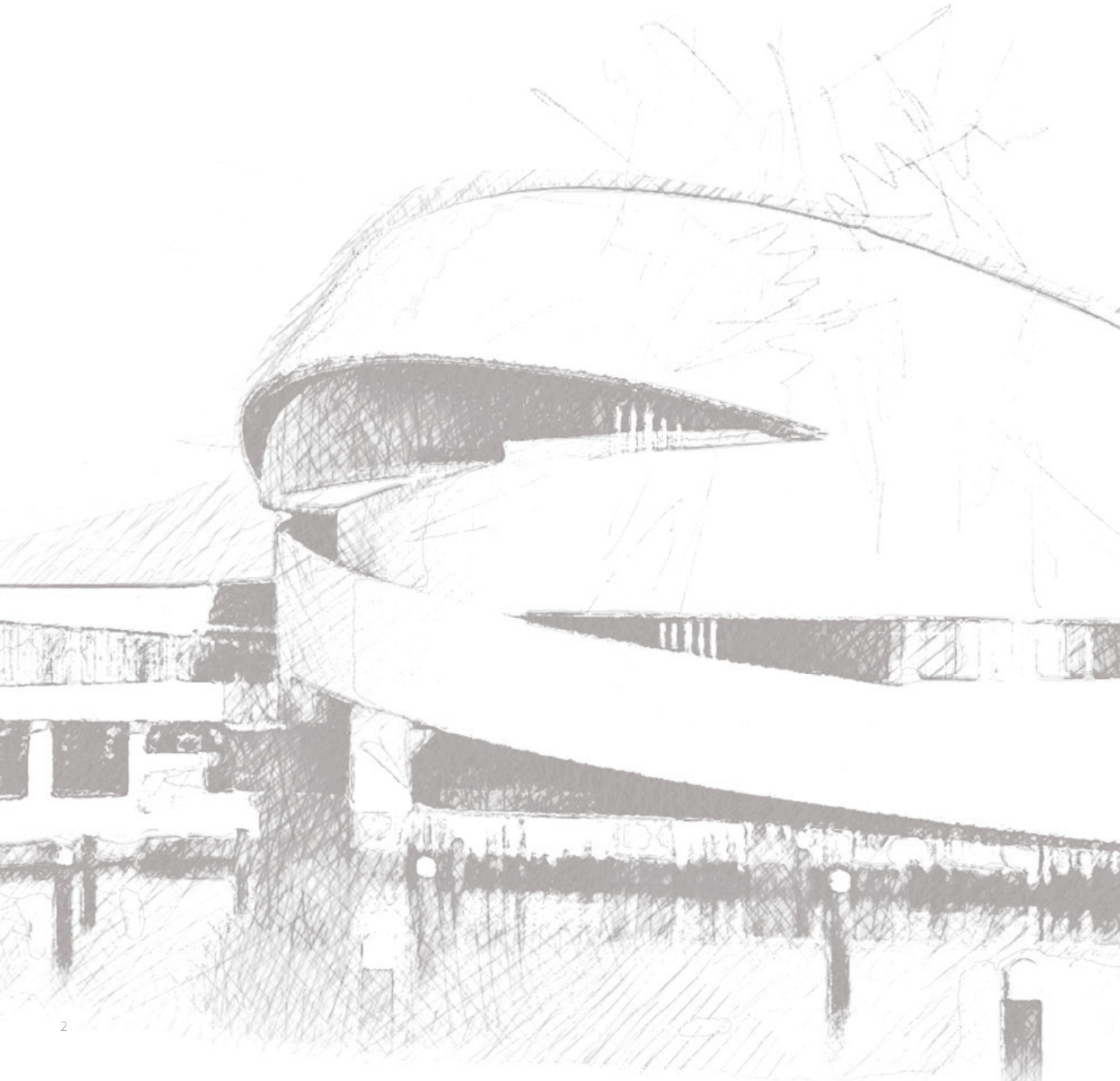
ciimar

ACTIVITY REPORT
2017



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MESSAGE FROM THE BOARD

2017 was the main year for the fully adaptation to the new finally headquarters of CIIMAR by the Ocean at the Cruise Terminal of Leixões Harbour. Take into account that not all infrastructures are fully operational, we managed to maintain the increasing trend of our main indicators.

CIIMAR continued the implementation of our strategic projects INNOVMAR (NOVELMAR, INSEAFOOD, ECOSERVICES), CORAL, MARINFO. In 2017 we got significant funds from the approval of new H2020 projects (GENIALG, SEAFOODTOMORROW, EMERTOX, IGNITE, ASSEMBLE plus). We also started the implementation of the two infrastructures EMBRC.PT and EMSO. PT. In 2017, a CIIMAR member - Pedro Leão - obtained an ERC Starting Grant, the most prestigious European Grant for young researchers.

CIIMAR members published 416 papers in internationally peer-reviewed journals and successfully contributed to the graduation of 27 PhD and 111 MSc students.

In 2017, two international patents were submitted, reflecting the increasing impact of our research and the success of the implementation of the measures to increase the technology transfer. Spin offs are being created that will be fully implemented in 2018.

CIIMAR will strength its role as the major research center of the U Porto in the area of the OCEAN, increasing our interactions in the framework of the U Porto Competence Center – OCEANUS, reinforcing the brand OCEAN of our university.

The director of the Board of CIIMAR

Vitor Vasconcelos

ABOUT CIIMAR

CIIMAR is a leading research and advanced training institution of the University of Porto, working at the frontiers of Ocean Knowledge and Innovation.

CIIMAR fosters an integrated approach to Ocean and coastal areas promoting the understanding and knowledge on physical, chemical and biological dynamics of these environments and the impact of natural and human disturbances, aiming to unravel links between these processes, grasp Ocean and ecosystems functioning and responses to global changes.

CIIMAR uses this knowledge-base to promote the natural capital and the sustained management of marine resources through monitoring of ecosystems health, optimization of aquaculture, and biotechnological exploitation of the resources for environmental and human health applications.

CIIMAR provides innovative solutions and products responding to actual economic and societal challenges. Among them are the demand for high-quality seafood, new drugs and marine products for industrial and medicinal needs, water quality, sustainable fisheries, preparedness for and mitigation of oil and HNS spills, environmental monitoring & risk assessment, preservation of ecosystems services, ocean & coastal management and Ocean Literacy.

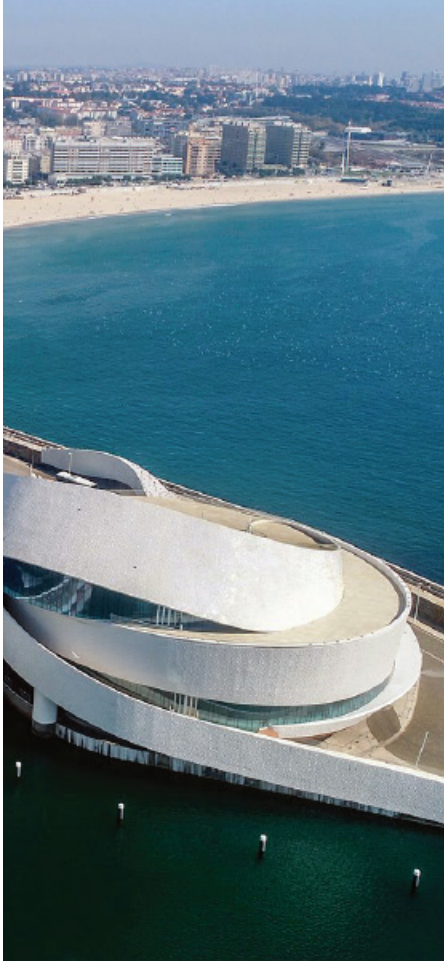
Mission

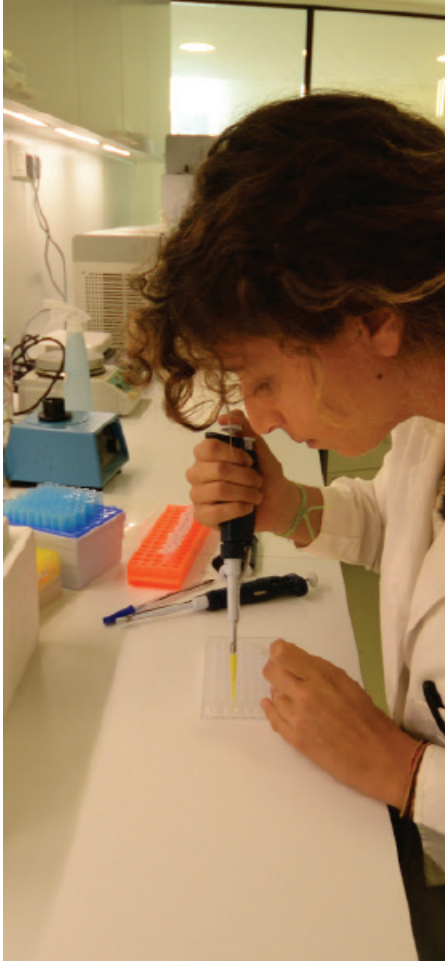
CIIMAR develops exceptional transdisciplinary and transnational research, promotes technological development and supports public policies and governance in Marine and Environmental Sciences.

Social Organs

The current social organs initiated their mandate in January 2016 and are composed as follows:

GENERAL ASSEMBLY	BOARD	FISCAL COUNCIL
President João José Oliveira Dias Coimbra	**President** Vitor Manuel de Oliveira e Vasconcelos	**President** Maria Luísa Machado Cerqueira Bastos
Chairs › Aires Manuel Pereira Oliva Teles › Fernando Francisco Machado Veloso Gomes › Aurélia Maria de Pinho Marques Saraiva › Ana Paula de Campos Mucha	**Board members** › Luísa Maria Pinheiro Valente › Maria Natividade Ribeiro Vieira › Luís Filipe Costa de Castro › Miguel Alberto Fernandes Machado e Santos	**Members** › José Fernando Magalhães Gonçalves › Maria Helena Tabuaço Rego Martins Peres





Headquarters

CIIMAR's new state-of-the-art facilities for research, training and services are located at the heart of the maritime industry and services in the Northern region of Portugal (Leixões harbour). The Centre features well-equipped laboratories for marine and maritime research, technological core platforms, high scale micro- and macroalgae cultivation and animal experimental facilities for freshwater and marine organisms approved by the Portuguese Veterinary Authority.

Besides its headquarters, CIIMAR comprises other partner facilities at five Units from U. Porto - Abel Salazar Biomedical Sciences Institute, and Faculties of Sciences, Engineering, Pharmacy and Law – and at Porto Polytechnic Institute, University of Madeira, CIIMAR-Madeira, FECFP, IPMA, ELA – EMSA, SRAP and CMVNC. CIIMAR is an integral research Centre of CIMAR - Associated Laboratory, together with CCMAR - University of Algarve.

Innovation and Technology Transfer

CIIMAR is involved in clustering activities, participating in National and European Knowledge and Innovation Networks, relevant in the Marine Economy Sector e.g.: OCEANUS, FORUM OCEANO, BLUEBIO ALLIANCE, EUROMARINE and European Marine Board.

The Centre follows an innovation-based strategy to foster technology transfer, promoting market-oriented research and industry liaison activities. Disruptive ideas and technologies are driven to technology acceleration programmes, such as BIP – Business Ignition Programme, identifying opportunities for new products and services and promoting technology transfer and the creation of new businesses.

Science and Society

CIIMAR has an extensive Outreach Program addressed to all society sectors, including students, teachers and general public. CIIMAR develops and coordinates several science dissemination and Ocean Literacy campaigns, such as the Ocean Action (awarded with the Green Project Award for the best Mobilization Initiative), Sea Change and Ocean Lab projects. CIIMAR is also responsible for various Traveling Exhibitions ("Plastic Sea", "Marine Monsters", "Marine Trophic Chains") and participates in numerous public events and science communication displays aimed to promote the dissemination of CIIMAR's research to society.

At the regional level, CIIMAR is also responsible for the scientific management of two Environmental Monitoring and Interpretation Centres (CMIAs) through cooperation protocols with the City Councils of Vila do Conde and Matosinhos.

RESEARCH LINES

Marine Biotechnology

Top research is also focused on the exploration of a wealth of Ocean resources for the discovery and characterization of new bioactive compounds with ecological, pharmaceutical or other industrial applications. The study of emerging toxins, development of biosensors for early detection systems, and development of bioremediation and phytoremediation tools for ecosystem recovery are other main goals of this research line.

P.I. **Vitor Vasconcelos**

Global Changes and Ecosystems Services

CIIMAR provides basic knowledge and tools to support the protection and management of marine, estuarine and freshwater ecosystems. Sustainable exploitation of ocean resources with production of valuable goods and services is fostered. Work is done in close collaboration with SMEs, international and local authorities, and stakeholders.

P.I. **Lúcia Guilhermino**

Biology, Aquaculture and Seafood Quality

Development of new aquaculture species, products, and innovative culture methods are central approaches to tackle societal challenges related to human nutrition and seafood quality. High impact scientific knowledge and innovation in these areas are provided through basic and applied research and transferred to end-users and the industry.

P.I. **Luísa Valente**

RESEARCH STRUCTURE

RESEARCH LINES	RESEARCH GROUPS	RESEARCH TEAMS
 MARINE BIOTECHNOLOGY	EVOLUTIONARY GENOMICS AND BLUE BIOTECHNOLOGY	EVOLUTIONARY GENOMICS
		BLUE BIOTECHNOLOGY AND ECOTOXICOLOGY
		EMERGENT BIOTECHNOLOGIES AND SEAFOOD PROCESSING
		CYANOBACTERIAL NATURAL PRODUCTS
	NATURAL PRODUCTS AND MEDICINAL CHEMISTRY	CHEMISTRY AND BIOLOGICAL ACTIVITY OF MARINE NATURAL PRODUCTS
		MEDICINAL CHEMISTRY: DRUG DISCOVERY AND DRUG DESIGN
	BIOREMEDIATION PROCESSES	BIOREMEDIATION AND ECOSYSTEMS FUNCTIONING
 GLOBAL CHANGES & ECOSYSTEMS SERVICES	CONTAMINATION PATHWAYS AND MECHANISMS OF TOXICITY	CONTAMINANT PATHWAYS & INTERACTIONS WITH MARINE ORGANISMS
		ENDOCRINE DISRUPTORS AND EMERGENT CONTAMINANTS
		SOIL/WATER INTERACTIONS
		MARINE AND COASTAL ENVIRONMENTAL TOXICOLOGY
		ECOTOXICOLOGY, STRESS ECOLOGY AND ENVIRONMENTAL HEALTH
	AQUATIC BIODIVERSITY AND CONSERVATION	HYDROBIOLOGY
		ESTUARINE ECOLOGY AND BIOLOGICAL INVASIONS
		AQUATIC ECOLOGY AND EVOLUTION
		COASTAL BIODIVERSITY
	OCEAN DYNAMICS, COASTAL AND WATER SYSTEMS	COASTAL AND OCEAN DYNAMICS
		COASTAL MONITORING AND MANAGEMENT
		MARINE ENERGY
		WATER RESOURCES SYSTEMS
	LAW OF THE SEA	LAW OF THE SEA
 BIOLOGY, AQUACULTURE & SEAFOOD QUALITY	AQUACULTURE AND SEAFOOD SAFETY	NUTRITION, GROWTH AND QUALITY OF FISH
		SAFE AND HEALTHY SEAFOOD AND SUSTAINABLE CONSUMPTION
	ANIMAL NUTRITION AND HEALTH	NUTRITION AND IMMUNOBIOLOGY
		ANIMAL PATHOLOGY
	ANIMAL PHYSIOLOGY AND FUNCTIONAL GENOMICS	ANIMAL GENETICS AND EVOLUTION
		HISTOMORPHOLOGY, PHYSIOPATHOLOGY AND APPLIED TOXICOLOGY
		MOLECULAR PHYSIOLOGY
		ECOPHYSIOLOGY

TECHNOLOGY PLATFORMS

CIIMAR Platforms developed under various European Marine Sciences Infrastructure Networks (e.g. EMBRC and EMSO) represent a new strategic axis of the Centre to grant access from other institutions in the European Research Area and companies. These Platforms provide access and offer support and expertise to wide range of experimental services and equipment.

PROJECT HIGHLIGHTS

FATTYCYANOS - FATTY ACID INCORPORATION AND MODIFICATION IN CYANOBACTERIAL NATURAL PRODUCTS

PRINCIPAL INVESTIGATOR AT CIIMAR
Pedro Leão

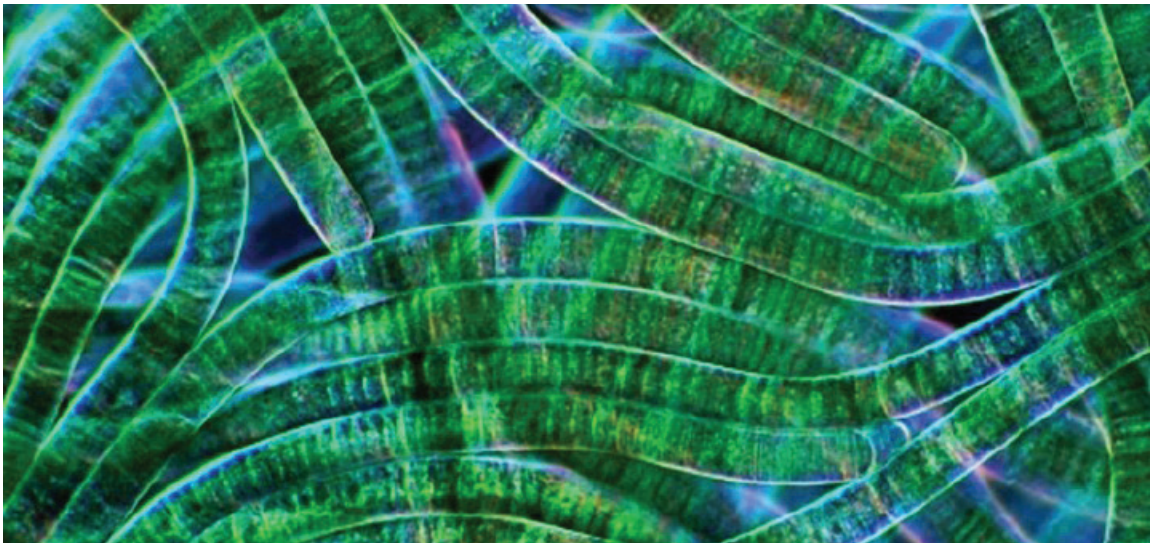
LEADER INSTITUTION
CIIMAR-UP

Funded by the European Union

erc
European Research Council
Established by the European Commission

Known, but mostly novel natural products (NPs) are in high demand – these are used in drugs, cosmetics and agrochemicals and serve also as research tools to probe biological systems. NP structures inspire chemists to develop new syntheses, and NP biosynthetic enzymes add to the metabolic engineer's toolbox. The advent of next generation DNA-sequencing has revealed a vastly rich pool of NP biosynthetic gene clusters (BGCs) among bacterial genomes, most of which with no corresponding NP.

Hence, opportunities abound for the discovery of new chemistry and enzymology that has the potential to push the boundaries of chemical space and enzymatic reactivity. Still, we cannot reliably predict chemistry from BGCs with unusual organization or encoding unknown functionalities, and, for molecules of unorthodox architecture, it is difficult to anticipate how their BGCs are organized. It is the valuable, truly novel chemistry and biochemistry that lies on these unexplored connections, that we aim to reveal with this proposal. To achieve it, we will work with a chemically-talented group of organisms – cyanobacteria, and with a specific structural class – fatty acids (FAs) – that is metabolized in a quite peculiar fashion by these organisms, paving the way for NP and enzyme discovery. On one hand, we will exploit the unique FA metabolism of cyanobacteria to develop a feeding strategy that will quickly reveal unprecedented FA-incorporating NPs. On the other, we will scrutinize the intriguing biosynthesis of three unique classes of metabolites that we have isolated recently and that incorporate and modify FA-moieties. We will find the BGCs for these compounds and dissect the functionality involved in such puzzling modifications to uncover important underlying enzymatic chemistry. This proposal is a blend of discovery- and hypothesis-driven research at the NP chemistry/biosynthesis interface that draws on the experience of the PI's work on different aspects of cyanobacterial NPs.



BLUEandGREEN – BOOSTING SCIENTIFIC EXCELLENCE AND INNOVATION CAPACITY IN BIOREFINERIES BASED ON MARINE RESOURCES

The exploitation of the ocean unraveled a huge diversity of organisms producing innovative compounds used as pharmaceuticals, nutraceuticals, cosmeceuticals and antifoulings. The aim of BLUEandGREEN is to strength the performance of CIIMAR - Interdisciplinary Centre of Marine and Environmental Research, from the low performing Member State Portugal, in the emergent area of marine biotechnology. This will be done by the establishment of a scientific strategy for stepping up and stimulating scientific excellence and innovation capacity in partnership with four internationally-leading counterparts at the EU level: the University of Helsinki, Finland, the University of Bergen, Norway, GEOMAR, Helmholtz Centre for Ocean Research Kiel, Germany, and Fundación MEDINA, Spain. BLUEandGREEN scientific strategy includes: to review the latest research and innovation advances in the sector, identify and address institutional network gaps and deficiencies; to raise staff´s research profile and excellence by training and mentoring; to increase stakeholder interaction and mobilization to research and innovation partnerships; to guide research to contribute to economic growth; to deliver a framework for strengthening a long-term research and innovation environment in marine biotechnology. The network enhancement will enforce cluster dynamics in close interaction with industrial partners to contribute to regional, national and EU Blue Growth strategies, especially to marine biotechnology industry. The implementation of brokerage with stakeholders and market-oriented projects will dismantle trade barriers, increase the ways of communication among partners and promote knowledge enhancements and its conversion in business. Being Portugal, especially North Portugal, a peripheral region, this will contribute to the change its economic landscape, giving new opportunities for development and job creation and reinforcing the role of marine biotechnology in the economic development of Europe.

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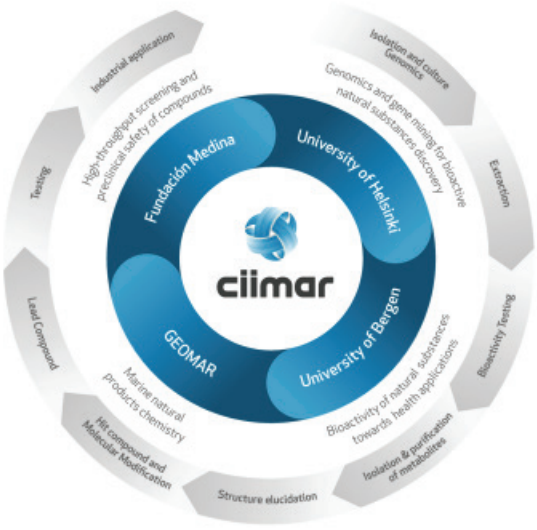
www.ciimar.up.pt/BLUEandGREEN/

Funded by the European Union



GENIALG – GENETIC DIVERSITY EXPLOITATION FOR INNOVATIVE MACRO-ALGAL BIOREFINERY

PRINCIPAL INVESTIGATOR AT CIIMAR
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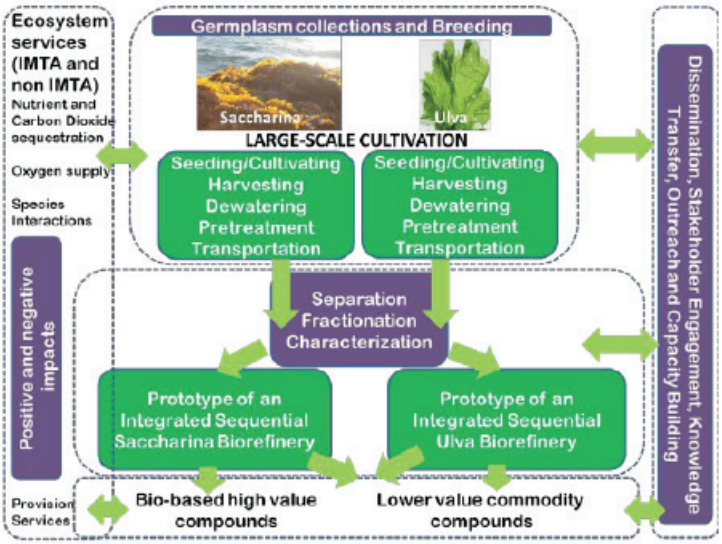
Funded by the European Union

Seaweed, or "macro-algae", has long been recognised as a valuable source of diverse bioactive compounds and has great potential to be used in pharmaceuticals, nutraceuticals and functional foods. However, until now, seaweed has been underexploited in Europe due to the challenges of expanding seaweed biomass production: costs need to be reduced, scales of production need to be increased, quality improved, and seaweed biomass needs to be successfully refined into multiple useful products. If these issues can be addressed, seaweed biomass production could become more economically and environmentally sustainable.

The overall objective of the GENIALG project is to boost the European Blue Economy by designing high-yielding seaweed cultivation systems. GENIALG aims to increase the production and sustainable exploitation of two high biomass yielding species of European seaweed: the brown algae (or sugar kelp) *Saccharina latissima* and the green seaweed (or sea lettuce) *Ulva rigida*. GENIALG is the first industry-driven project bringing together pioneering companies in large-scale integrated European biorefineries and experts in seaweed cultivation, genetics and metabolomics to boost the seaweed industry. GENIALG will combine available knowledge in seaweed biotechnology with reliable eco-friendly tools and methods to scale up current small cultivation seaweed operations.

Two pilot pre-industrial seaweed biorefinery plants will provide vital seaweed compounds for a wide range of products such as cosmetics, pharmaceuticals, food and feed ingredients, fine and specialty chemicals, additives and blends such as gels, as well as precursors for biodegradable plastics. GENIALG will help lead the way in the Blue Biotechnology sector in Europe, while addressing social acceptability and competition for maritime space.



NOMORFILM – NOVEL MARINE MOLECULES AGAINST BIOFILM: APPLICATION TO MEDICAL DEVICES

In the last decades, an increasing number of antibiotic resistant bacterial pathogens have become an important problem worldwide. This includes also biofilmassociated pathogens, causing prosthetic devices infections, and requiring costly implant replacement. Biofilm formation is especially important in infections related to implants and catheters. Although some of these colonizing microorganisms do not cause infection, they can promote an immune reaction giving rise to inflammation at underlying tissue. This finally causes a release of the implant, which must be removed and replaced by a new one. These surgical interventions entail an increase in antibiotic consumption, together with healthy cost of about 50,000-90,000 per infection episode.

Taking both problems in account, the search of new antimicrobial agents that will be effective against bacteria in their two stages of life (planktonic and biofilm), is a priority need in the clinical practice. Overall objective of this project is to search for such bioactive compounds from EU microalgae collections, which will be useful in the treatment of these kinds of infections and will be incorporated in the manufacturing of medical prosthetic devices.

The NOMORFILM project introduces a new concept to tackle biofilm infections which combines the two major antibiofilm strategies in use: high throughput screening and coating. NOMORFILM makes use of microalgae as the source of compound libraries. 6,800 Microalgae species coming from diverse ecosystems and different continents will be screened and cultured in order to maximize their potential for production of antibiofilm molecules. Thus, each microalgae species will act as a natural multireactor producing a large number of compounds and microalgae biodiversity, which is very high, will increase significantly the degree of structural diversity of the different families of compounds.

The new lead compounds discovered will be incorporated into functionalized nanoparticles and applied for coating prosthetic devices. These novel bionanomaterials will certainly make a breakthrough to the infection control and thus will make a great impact in the growing field of nanomedicine.

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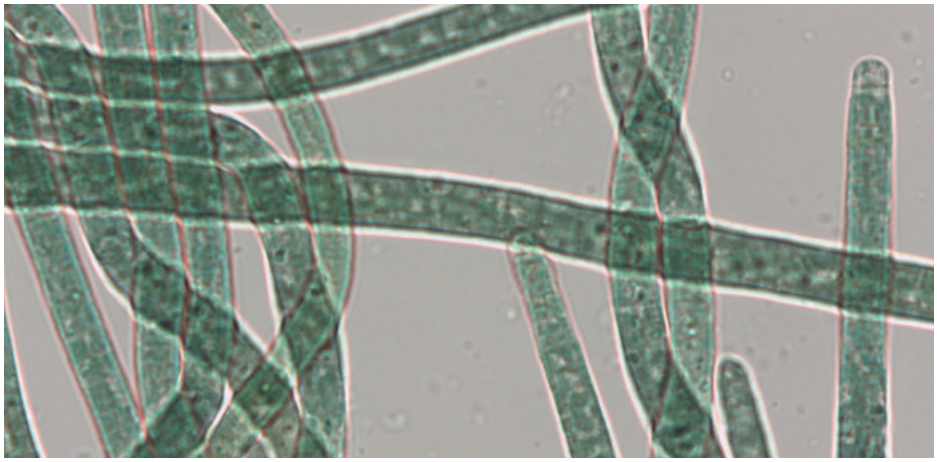

SEAFOODTOMORROW – NUTRITIOUS, SAFE AND SUSTAINABLE SEAFOOD FOR CONSUMERS OF TOMORROW

PRINCIPAL INVESTIGATOR AT CIIMAR
Mª Leonor Nunes

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IPMA

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www.seafoodtomorrow.eu

SEAFOODTOMORROW aims to strengthen the European seafood production and processing industry by providing validated, commercially viable, and eco-innovative solutions that will improve seafood quality and safety, minimise environmental impacts, and drive socioeconomic development within the seafood industry.

Meeting the growing market need for safe, sustainable seafood is a formidable challenge for the European seafood industry. With European seafood imports presently reaching almost 70%, and global food demands projected to increase by 80-100% by 2050, it is vital to source and validate environmentally friendly and innovative seafood production and processing methods that will reduce European dependency on imports. Such solutions need to underpin seafood security in-line with market demand, whilst maintaining quality and traceability throughout the value chain to support consumer confidence.

Expected Results:

- Validation of nutritional and safety aspects of eco-innovative seafood solutions through certified methodologies carried out by independent partners.
- Easily-accessible database with seafood innovative products validation data for the implementation of a digital traceability tool linked to quality labels.
- Improved understanding of market acceptance of eco-innovative seafood solutions in different European regions and demographics.
- Validation of sustainable solutions from economic and environmental perspectives.
- Benchmark for certification schemes of seafood quality and traceability for industry to strengthen consumer confidence and trust in European seafood.
- Reduction of public health risks and promotion seafood consumption through transparent and responsible communication, dissemination, knowledge transfer and exploitation of the outcomes to the different stakeholders.

IGNITE - COMPARATIVE GENOMICS OF NON-MODEL INVERTEBRATES

Invertebrates, i.e., animals without a backbone, represent 95% of animal diversity on earth but are a surprisingly underexplored reservoir of genetic resources. The content and architecture of their genomes remains poorly characterised, but such knowledge is needed to fully appreciate their evolutionary, ecological and socio-economic importance, as well as to leverage the benefits they can provide to human well-being, for example as a source for novel drugs and biomimetic materials.

Europe is home to world-leading expertise in invertebrate genomics and IGNITE will gather together this European excellence to train a new generation of scientists skilled in all aspects of invertebrate genomics. We will considerably enhance our knowledge and understanding of animal genome knowledge by generating and analysing novel data from undersampled invertebrate lineages and by developing innovative new tools for high-quality genome assembly and analysis.

The well-trained genomicists emerging from IGNITE will be in great demand in universities, research institutions, as well as in software, biomedical, agrofood and pharmaceutical companies. Through their excellent interdisciplinary and intersectoral training spanning from biology and geobiology to bioinformatics and computer science, our graduates will be in a prime position to take up leadership roles in both academia and industry in order to drive the complex changes needed to advance sustainability of our knowledge-based society and economy.

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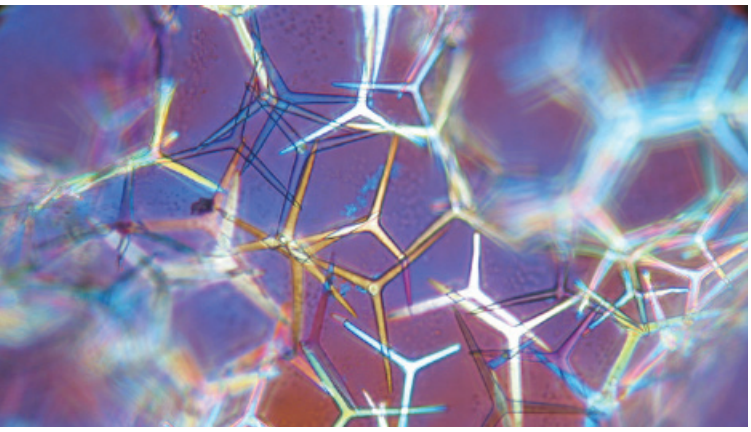
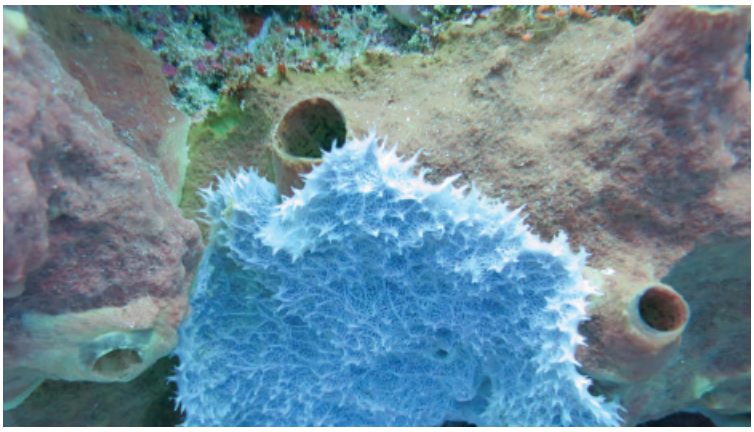

EMERTOX - EMERGENT MARINE TOXINS IN THE NORTH ATLANTIC AND MEDITERRANEAN: NEW APPROACHES TO ASSESS THEIR OCCURRENCE AND FUTURE SCENARIOS IN THE FRAMEWORK OF GLOBAL ENVIRONMENTAL CHANGES

PRINCIPAL INVESTIGATOR AT CIIMAR
Vitor Vasconcelos

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CIIMAR-UP

Funded by the European Union

Emergent Marine Toxins in the North Atlantic and Mediterranean: New Approaches to Assess their Occurrence and Future Scenarios in the Framework of Global Environmental Changes- EMERTOX- aims to map the actual situation in emergent marine toxins and the producing organisms, develop new approaches to assess their occurrence and predict the possible future scenarios in the framework of global warming. The consortium, formed by a multidisciplinary team, will produce a joint research and innovation project that will exploit the complementary expertise of the participants and will create synergies among them.

The main idea is to assess the current situation on potentially harmful algae and the relevant emerging toxins in different geographical areas (Mediterranean Sea, and North Atlantic), estimate different future scenarios based on molecular data (routes of dispersion) and modelling as well as develop new approaches to detect and quantify algal toxins (chemical methods, immunoassays, sensors).

The team involved in EMERTOX will approach the problematic of emerging marine toxins using a multidisciplinary approach, including physical oceanographers (data analysis, modelling), marine biologists (vectors and toxin producing organisms), geneticists (molecular characterization), chemists (chemical analysis), toxicologists (mechanisms of action, also to develop new functional assays), biotechnologists (development of new assays), engineers (sensors and sampling apparatus).

ATLANTOS – OPTIMISING AND ENHANCING THE INTEGRATED ATLANTIC OCEAN OBSERVING SYSTEMS

The overarching objective of AtlantOS is to achieve a transition from a loosely-coordinated set of existing ocean observing activities producing fragmented, often monodisciplinary data, to a sustainable, efficient, and fitfor-purpose Integrated Atlantic Ocean Observing System (IAOOS). This will be achieved through research and innovation activities focused on: defining requirements and systems design, improving the readiness of observing networks and data systems, engaging stakeholders around the Atlantic, as well as strengthening Europe's contribution to the Global Ocean Observing System (GOOS), a major component of the Group on Earth Observations (GEO), its Global Earth Observation System of Systems (GEOSS), and specifically on its emerging "Oceans and Society: Blue Planet" initiative. AtlantOS contributes to blue growth by merging new information needs relevant to key sectors such as transport, tourism, fisheries, marine biotech, resource extraction and energy with existing requirements. AtlantOS significantly contributes to trans-Atlantic cooperation by integrating existing observing activities established by European, North and South American, and African countries and by filling existing gaps to reach an agile, flexible IAOOS and associated ocean information systems around the Atlantic.

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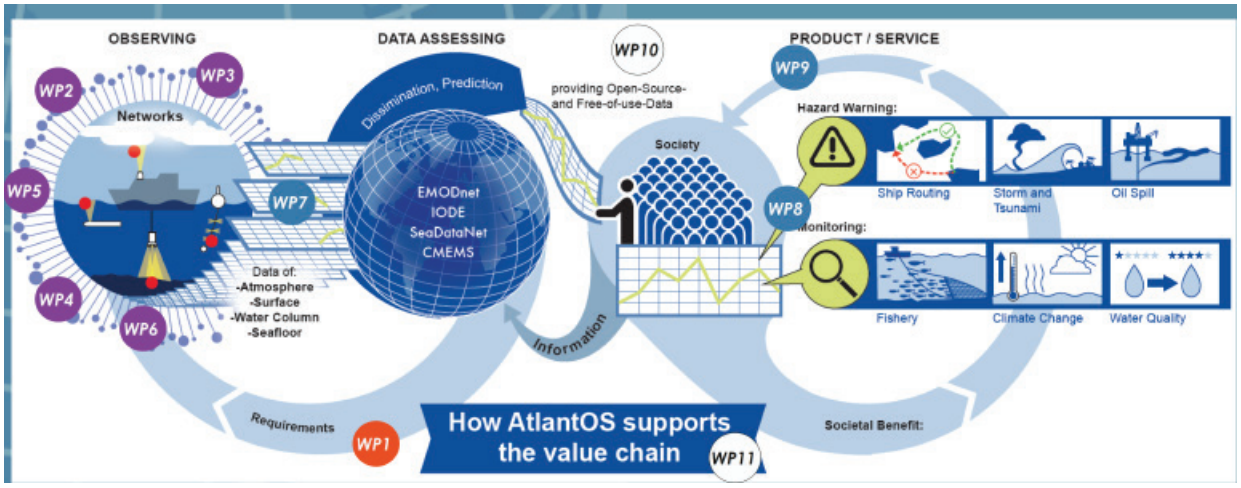


ASSEMBLE PLUS - ASSOCIATION OF EUROPEAN MARINE BIOLOGICAL LABORATORIES EXPANDED

PRINCIPAL INVESTIGATOR AT CIIMAR
Vitor Vasconcelos

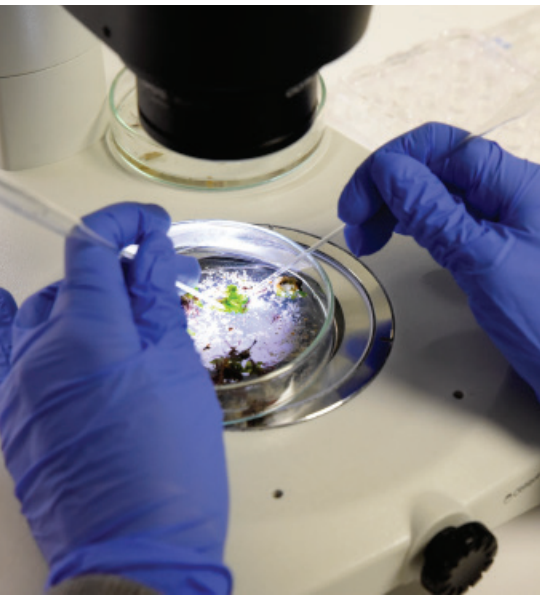
LEADER INSTITUTION
UPMC

WEBSITE
www.assembleplus.eu

ASSEMBLE Plus will provide scientists from academia, industry and policy with a quality-assured programme of access to the marine biological station facilities and resources. These stations offer a wide variety of services, including access to marine ecosystems, unique marine biological resources, state-of-the-art experimental and analytical facilities with integrated workflows, historical observation data, and advanced training opportunities. The goal i of the project s to stimulate European fundamental and applied research excellence n marine biology and ecology, thereby improving our knowledge and technology-base for the European bioeconomy, policy shaping and education.

ASSEMBLE Plus brings together 32 marine stations and institutes with modern research infrastructures and track-records of unique service provision, from 14 European and two associated countries, under the leadership of the European Marine Biological Resource Centre (EMBRC), an ESFRI consortium developed from the previous ASSEMBLE (FP7) partnership.

The sum of the actions envisaged in ASSEMBLE Plus, including Access, Networking and Research will ultimately increase the number of users of marine biological stations and shape novel strategic development perspectives of the partners, to be based on effective integration and efficient complementarities, resulting in a key contribution to their long-term sustainability.



SEA CHANGE

Sea Change is an EU H2020 funded project that aims to establish a fundamental "Sea Change" in the way European citizens view their relationship with the sea, by empowering them, as Ocean Literate citizens, to take direct and sustainable action towards a healthy ocean, healthy communities and ultimately a healthy planet.

By using the concept of Ocean Literacy, Sea Change will create a deeper understanding amongst European citizens of how their health depends on the health of our seas and ocean. Sea Change will move to bring about real actions using behavioural and social change methodologies. Building upon the latest social research on citizen and stakeholder attitudes, perceptions and values, the Sea Change partnership will design and implement mobilisation activities focused on education, community, governance actors and directly targeted at citizens. These actions will be assessed for their effectiveness which, in turn, will allow the project to improve its techniques and spread a "Sea Change" in behaviour across Europe.

PRINCIPAL INVESTIGATOR AT CIIMAR
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/SeaChangeProjectEU

Funded by the European Union

INNOVMAR – INNOVATION AND SUSTAINABILITY IN THE MANAGEMENT AND EXPLOITATION OF MARINE

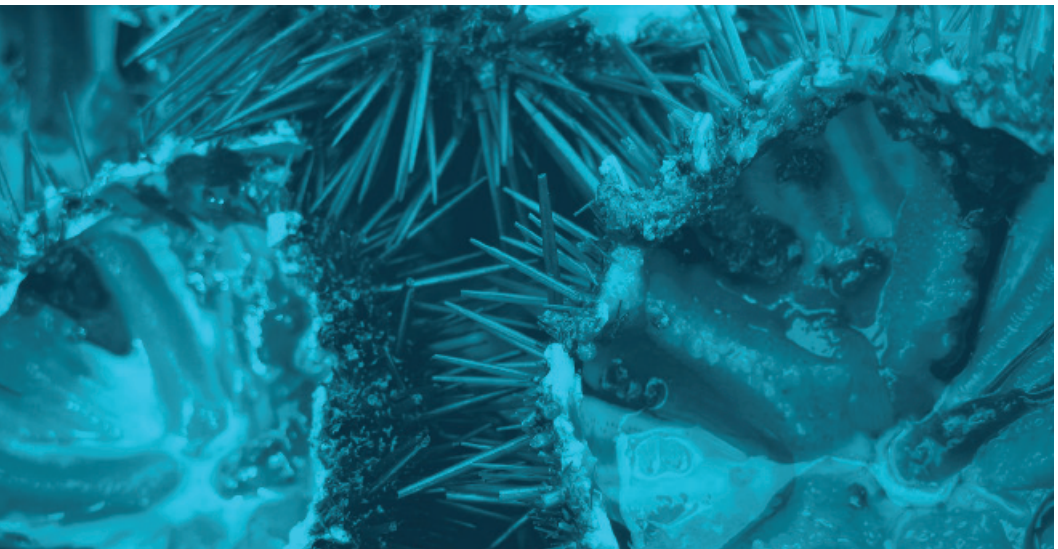
PRINCIPAL INVESTIGATOR AT CIIMAR
Vitor Vasconcelos (INNOVMAR, NOVELMAR), Luísa Valente (INSEAFOOD), Lúcia Guilhermino (ECOSERVICES)

LEADER INSTITUTION
CIIMAR-UP

WEBSITE
innovmar.ciimar.up.pt

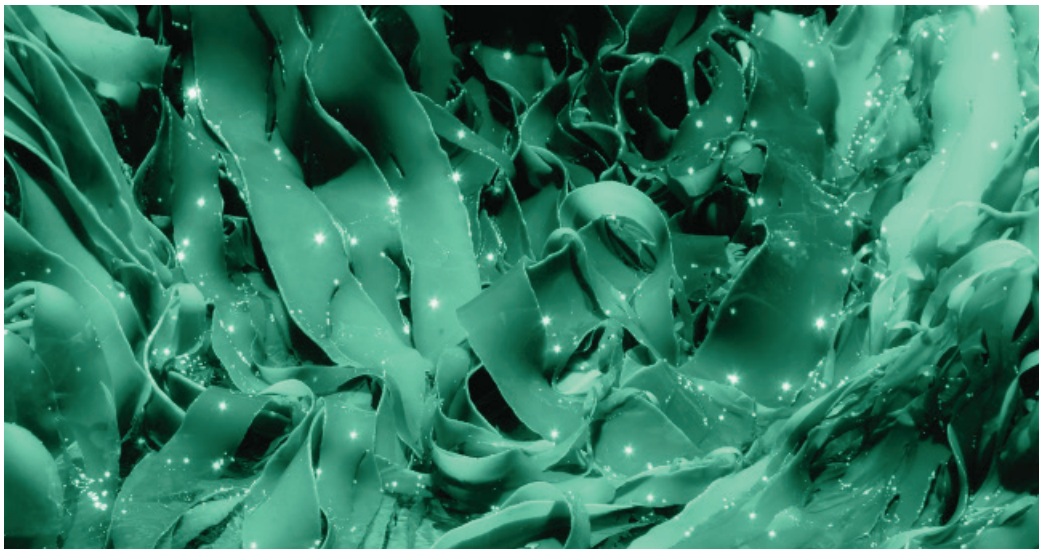
INNOVMAR – Innovation and Sustainability in the Management and Exploitation of Marine Resources aims to develop and consolidate the main research lines of CIIMAR through the implementation of 3 projects: INSEAFOOD, NOVELMAR and ECOSERVICES. INNOVMAR will unravel novel marine products with biotechnological applications; promote innovation and valorization of seafood products, in especial new aquaculture species and assess the environmental quality, vulnerability and risks for the sustainable management of NW coast natural resources and ecosystem services.

INSEAFOOD – Innovation and valorization of seafood products: meeting local challenges and opportunities – aims to enhance CIIMAR scientific competences in the area of Aquaculture and Seafood Quality that are relevant for the implementation of the North Portugal Smart Specialization Strategy. Research effort will be focused on economically important and well established shellfish (Pacific oyster, *Crassostrea gigas*) and finfish species (European seabass, *Dicentrarchus labrax*) that play a major role in the Portuguese aquaculture sector. The project will also monitor marine algae and natural populations of sea urchin (*Paracentrotus lividus*). The production and promotion of innovative seafood products of high value is expected, such as high quality sea urchin gonads or added nutritional value fish, in order to better exploit Portuguese marine resources and boost the economic and social sectors.



NOVELMAR – Novel marine products with biotechnological applications – aims to strengthen and consolidate CIIMAR know-how and competence in the area of marine biotechnology in special on the use of marine organisms (e.g. cyanobacteria, bacteria, fungi and other organisms) bioactive products that may have pharmacological, nutraceutical, cosmeceutical, antifouling and other industrial applications. The main innovation this research line will be the use of a double approach – a genomic and a bioassay-guided approach, to study a diversity of industrial applications using a biorefinery pipeline concept, aiming to produce zero residues. We will apply a methodology that will involve several levels of biological organization from the DNA (sequencing and survey of gene clusters that produce some of the compounds and further heterologous expression) to the organisms.

ECOSERVICES – Assessing the environmental quality, vulnerability and risks for the sustainable management of the NW coast natural resources and ecosystem services in a changing world, is aligned CIIMAR's research line: Global Changes and Ecosystem Services. The central goal of ECOSERVICES is to strengthen and consolidate CIIMAR expertise and competence to assess environmental quality, vulnerability and risks providing knowledge, technology and solutions for the sustainable management of natural resources and ecosystem services. One of the main innovations of ECOSERVICES is the assessment of the effects, pressures and risks of a wide range of abiotic and biotic factors (exotic invasive species, pathogens, chemical contamination, physical and other alterations due to global climate changes) acting together. This will be achieved through a multidisciplinary approach including endpoints at different levels of biological organization (from molecular to the ecosystem level), physical, chemical and other system parameters, supported and integrated through robust integration modelling with distinct components.



CORAL – SUSTAINABLE OCEAN EXPLOITATION: TOOLS AND SENSORS

CORAL
Sustainable Ocean Exploitation

PRINCIPAL INVESTIGATOR AT CIIMAR
Filipe Castro (Sensors) and Miguel Santos (Tools)

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CIIMAR-UP

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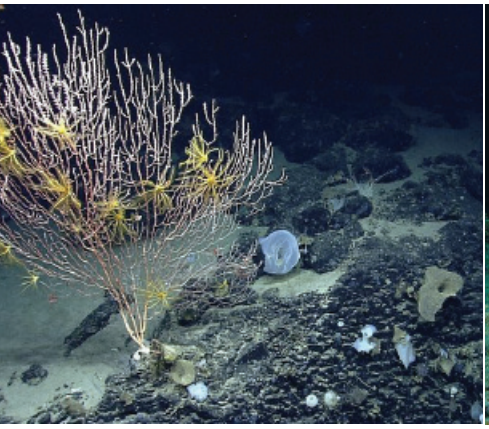
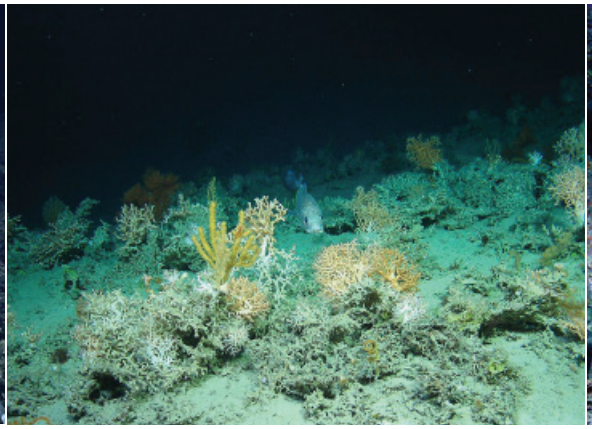
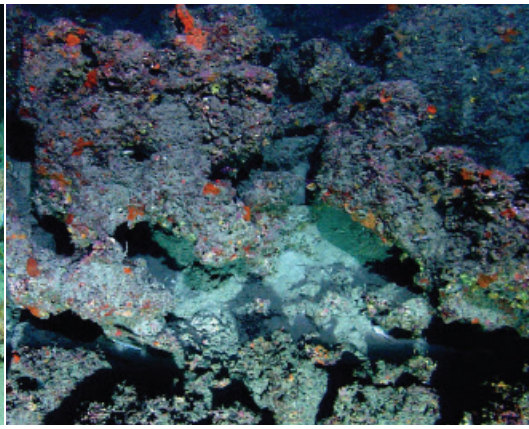
NORTE 2020
PROGRAMA OPERACIONAL REGIONAL DO NORTE

PORTUGAL 2020

UNIÃO EUROPEIA
Fundo Europeu de Desenvolvimento Regional

A considerable fraction of human populations inhabit coastal regions and crucially depend on the resources and services provided by marine ecosystems. Historically, fisheries have been a central resource providing a substantial fraction of the human dietary intake, namely vital nutrients for human health. More recent developments have open new horizons for Oceanic resource exploitation, namely those related with discoveries in biotechnology or new mineral non-hydrocarbon sources in deep-sea ecosystems. The later has been more and more often recognized as an important source of minerals and biotech-molecules. The limited available information on deep-sea environments implies a great effort on the acquisition of baseline scientific knowledge to ensure a sustainable and responsible exploitation of deep-sea resources. In this context, the development of adequate technological tools and sensors is a fundamental task. The project devised by CIIMAR and INESC TEC, CORAL - Sustainable Ocean Exploitation: Tools and Sensors, sets as central objective to address the sustainable exploitation of marine resources towards filling societal needs and to propose challenge-driven solutions in deep-sea environments. This implies the improvement of the knowledge of the natural processes governing ocean dynamics and ecosystem functions, as well as the major forces driving ecosystems changes, both on regional and global scales. This approach is also directly linked with our capacity to "measure" resources and the impact of their exploitation, and finally to exploit with minimal environmental impact. Our ability to interpret this conceptual "triad", Ecosystem - Resources-Environment, is largely dependent with the capacity to develop new tools to in situ measure resources, to collect samples at distance for analysis, to develop new standards for environmental assessment in new frontiers such as deep sea, and thus develop sensing abilities capable of diagnosing vital variables for living organisms in rearing conditions (e.g. aquaculture), but also to exactly anticipate negative impacts in humans and wildlife via the development of biological sensors.

MARINFO – INTEGRATED PLATFORM FOR MARINE DATA ACQUISITION AND ANALYSIS

MarInfo is a project where CIBIO/InBio (ICETA), CIIMAR, SYSTEC and LSTS (FEUP) collaborate to implement an Integrated Platform for Marine Data Acquisition and Analysis, aiming to collect, mobilize, store, synthesize, and ultimately provide both physical and biological data gathered from the marine environment.

MarInfo takes an interdisciplinary approach involving a technological push, driven by experts in engineering and automation, and an application pull, driven by oceanographers and marine biologists. It comprises two distinct, complementary research lines. The first focuses on the development of technology to ease the acquisition of data in the marine environment. Its main objective is to integrate observation and communication technologies to assess specific information such as physical/environmental data or species diversity and behavior, considering the particular regional Atlantic Ocean conditions and dynamics. Autonomous vehicles will be used to overcome limitations to the sustained (systematic) collection of data in the vast and harsh marine environment, and cheap miniaturized loggers will be developed and deployed, at fixed sites or attached to large marine animals, to obtain information on several physical parameters of interest.

The second line focusses on the integration of large volumes of already available data and of newly acquired physical, chemical and biological information into a cohesive framework. Oceanographic data from multiple sources (fixed stations, autonomous vehicles, large predators, benthic sensors) shall be coupled with remote sensing data and fed into regional oceanographic models, allowing forecasts of climateinduced environmental changes and assessment of regional dynamics. New bioinformatic tools will be designed and implemented to generate biological diversity datasets (using metabarcoding/NGS technology) and energetics and trophodynamics datasets, to integrate knowledge at the ecosystems level.

The data acquired and derived information will allow a deeper understanding of the mechanisms coupling oceanographic and biogeochemical processes, unraveling interactions between them and, therefore, supporting decisions towards a sustained use of the marine resources.

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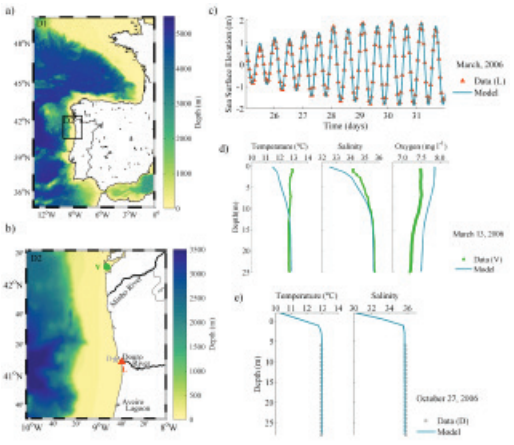


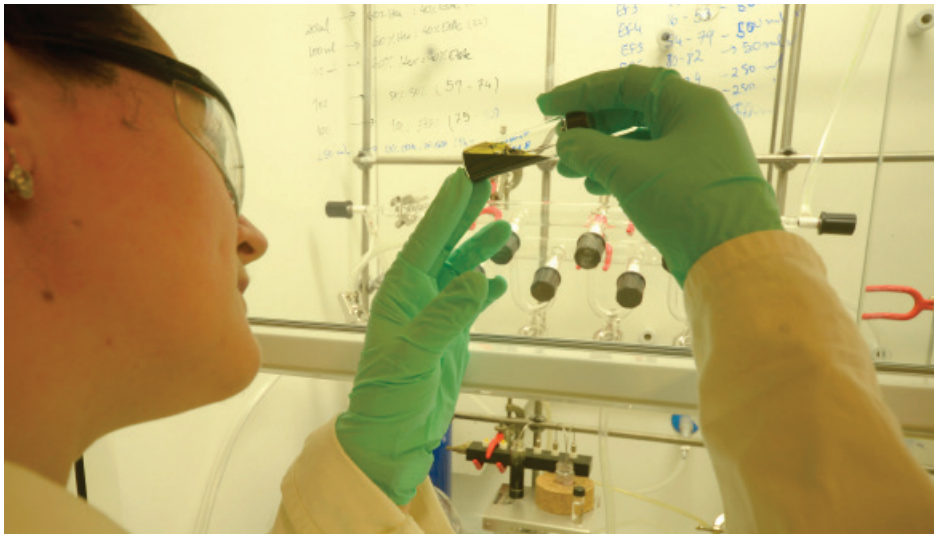
VALORMAR - INTEGRAL VALUATION OF MARINE RESOURCES: POTENTIAL, TECHNOLOGICAL INNOVATION AND NEW APPLICATIONS

PRINCIPAL INVESTIGATOR AT CIIMAR
Vitor Vasconcelos

LEADER INSTITUTION
SONAE, CIIMAR-UP

The project ValorMar is leaded by a reference institution – SONAE - and integrates 20 enterprises and 16 Research and Development institutions, being CIIMAR the R&D leader of the project, with a wide national geographical distribution. ValorMar will develop innovative technological solutions that potentiate the valorization and efficient use of marine resources by the integration of the value chains using the circular economy concept and integrating: food industry, biomedical, pharmaceutical, cosmetics and aquaculture.

ValorMar main objective is the valorization of marine resources thorough research, development and demonstration of new products and the improvement of the productive processes, proposing innovative solutions that lead to the creation of new healthy food products using innovative, efficient and sustainable technologies. The products, processes and services will be produced in the framework of a transversal mobilization of human resources with extensive curricula and experience in the development and implementation of R&D projects in the thematic areas of ValorMar.



MOBFOOD – MOBILIZING SCIENTIFIC AND TECHNOLOGICAL KNOWLEDGE IN RESPONSE TO THE CHALLENGES OF THE AGRI-FOOD MARKET

MobFood project is the result of an open debate carried out by several agents from the agribusiness that aims to find the right path to promote the competitiveness of the national food industry in an organized and integrated manner. It will be strategically undertaken with a close collaboration between scientific institutions and private companies grounded on economic growth measures based on R&D, innovation and technologies for new products, services and processes achievement with direct effects in all value chain. The principal aim is to make the sector totally sustainable, resilient, open, safer and with an effective utilization of resources being consumer-driven.

The main goals will be attained through the implementation of the solution in three fundamental principles: "Food Safety and Sustainability", "Food for Health and Well-being" and "Safe Food and Quality", embodied in the research and development for several processes, products or services.

The join-venture is composed by 47 entities that represent all Portuguese agribusiness, with participant companies from different agroindustry subsectors. R&D entities participants will bring the ability for a complete approach of the different areas of key knowledge for an acute development of the Portuguese food industry.

The MobFood project is organized in 9 areas of intervention: Emerging Technologies, Resources Valorization, Sustainable Packaging, Nutrition, Health and Well-being, Quality and Food Safety, Authenticity and Traceability of products, Logistics, Consumer and "Coordination, implementation, dissemination and exploitation of results".

PRINCIPAL INVESTIGATOR AT CIIMAR
Luisa Valente

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PRIMOR SA

CYANOBESITY – CYANOBACTERIA AS A SOURCE OF BIOACTIVE COMPOUNDS WITH EFFECTS ON OBESITY-ASSOCIATED MORBIDITIES – SCREENING AND MOLECULAR MECHANISM

PRINCIPAL INVESTIGATOR AT CIIMAR
Ralph Urbatza

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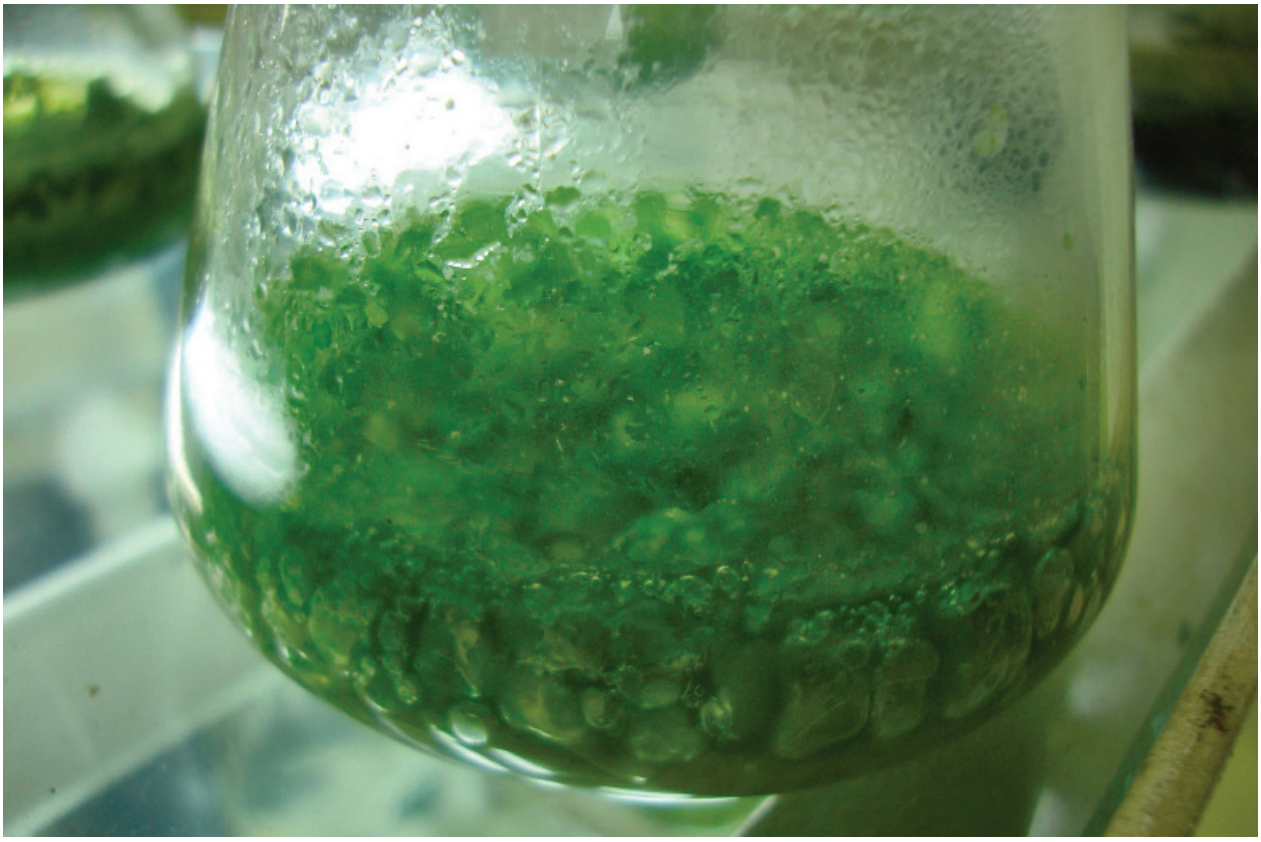
MarineBiotech

An urgent demand for new anti-obesogenic compounds is present, and marine cyanobacteria promise to be an excellent source for natural-derived molecules and novel nutraceuticals. Some strains of cyanobacteria are commercially available for consumption due to their beneficial properties to human health. Preclinical studies have been performed in various animal models and demonstrated hypolipidemic activities in rats and mice, lowering hepatic cholesterol and triglyceride levels.

In the proposed project, marine cyanobacterial strains of a culture collection will be screened for beneficial properties towards obesity and obesity-related comorbidities (obesity, fatty liver disease, diabetes, appetite and hyperlipidaemia) and the chemical structure will be elucidated. By applying an innovative biotechnological platform, the interactions from oral administration to the blood stream will be analyzed, and with different target tissues in vitro. A proof of concept regarding the improvement of metabolism will be performed in a relevant physiological model.

The general aim of the project is to develop novel nutraceuticals that have the potential to improve the quality of life for millions of people worldwide.



EBB – EUROPEAN MARINE BIOLOGICAL RESOURCE CENTRE BANK

PRINCIPAL INVESTIGATOR AT CIIMAR
Vitor Vasconcelos

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Universidade de Vigo

The coastal regions in Europe through their S3s acknowledge the potential of Marine Biological Resources (MBRs) and especially blue biotechnologies (technological applications that use marine biological systems, living organisms or derivates to make or modify products or processes for specific uses, as defined by the Convention on Biological Diversity) to generate and promote employment, economic and regional development, contributing to growth and cohesion.

MBRs are one of the main services provided by marine ecosystems. Culture collections of MBRs are key to the systematic research of interesting and unique genes, bioactives and biomaterials from the marine environment with potential for commercial development and job creation in coastal regions.

The EMBRC BioBank (EBB) will set the basis for the common operation of the distributed marine biobanking facilities of the European Marine Biological Resource Centre (EMBRC) by:

1. Setting up technological tools and common procedures for the ex-situ maintenance of MBRs along the whole phylogenetic tree of life; and:
2. The application of best practice guidelines throughout the EBB collections to ensure compliance with regulatory framework that sets the rules on access and benefit sharing (ABS) on the use of marine bioresources for commercial and academic research.
3. The development of innovation use cases involving industrial end users and administrations at the national and European level with competence in regulating ABS for the production of a set of best practice guidelines for ABS compliance when using MBRs for innovation purposes.

The EBB will ultimately facilitate sustainable access to Atlantic marine biodiversity, its associated data, and extractable products for local and international academia and industry users.

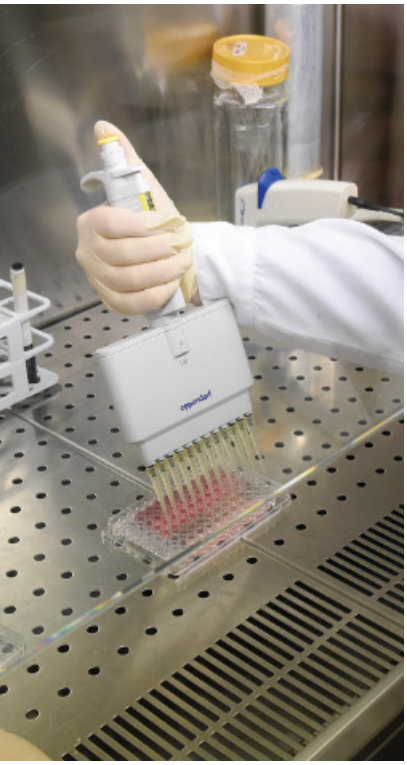
CVMAR+I – INDUSTRIAL INNOVATION UNDER THE CONTEXT OF BIOTECHNOLOGICAL VALORIZATION OF MARINE RESOURCES AND BY-PRODUCTS

PRINCIPAL INVESTIGATOR AT CIIMAR
Vitor Vasconcelos

LEADER INSTITUTION
Universidade do Minho

Industrial innovation through specific collaborations between enterprises and research centers in the context of marine biotechnological valorization - CVMar+i aims to promote industrial innovation around marine biotechnology by the proposal of new products based in marine compounds. This will be done by a synergic effort of enterprises and research enters in the transboundary area, benefiting from the complementarity of the partners.

The project will benefit from former POCTEP projects implemented by partners of this Consortium that can now be potentiated and without who's the innovation proposed would not be possible. We will develop tools that allow the enterprises of the region to increase their investment in innovation, reinforcing the role of the region in the Blue Economy. This is in alignment with RIS3T Galicia-North Portugal, developing products based on marine resources and sub-products in the areas of health (tissue regeneration and pharmacology), food and industrial applications.



MARINAQUA4ALGAE - IMPROVING BIO-UTILISATION OF MARINE ALGAE AS SUSTAINABLE FEED INGREDIENTS TO INCREASE EFFICIENCY AND QUALITY OF AQUACULTURE PRODUCTION

Global population growth and increase in living standards will push up the demand for fish-derived protein in the future. However, resource scarcity (feed, water and energy), environmental impacts, and changes in climate and growing conditions can seriously hamper aquaculture that supplies a significant proportion of human food. New sustainable protein and lipid sources and improved technologies to increase bio-availability of existing sources will be needed to ensure adequate supply of aquafeeds to ensure growth of aquaculture. On the other hand, the growth of the industry has caused environmental concerns. Interestingly, aquaculture effluents can be an excellent medium for algal growth, although they are not usually reused since they contain residual organic compounds, minerals and other micro-pollutants. MARINALGAE4aqua is an innovative research project that targets the development of strategies to increase efficiency of important European farmed fish species (Atlantic salmon and European sea bass) and reduce the environmental impact using micro- and macro-algal biomass as feed ingredients by:

I. Culturing marine algae under optimized technological processes to remove organic compounds and minerals from fish farm effluents, and producing high value products for aquafeeds while recycling nutrients; thus improving the water body quality and reducing the environmental impact.

II. Identifying novel feed additives to improve fish digestive capacity and nutrient metabolism upon using the selected algae.

III. Improving fish growth and end product quality, reducing time to slaughter and providing a safe and healthy food item with wide consumer acceptance.

MARINALGAE4aqua aims to tackle the sustainability challenges of the aquafeed industry by developing cost-effective and resource-efficient alternatives to FM and FO. MARINALGAE4aqua is innovative and cutting edge - it adopts a multidisciplinary approach, integrating molecular (genomics, proteomics) and traditional tools to address physiological, nutritional and environmental challenges in modern aquaculture – providing state-of the-art knowledge to identify strategies to increase efficiency of farming important European fish species.

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RASORGMAT

RASORGMAT – DEVELOPING WATER TREATMENT TECHNOLOGY FOR LAND-BASED CLOSED CONTAINMENT SYSTEMS (LBCC-RAS) TO INCREASE EFFICIENCY BY REDUCING THE NEGATIVE EFFECTS OF ORGANIC MATTER

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FCT Fundação para a Ciência e a Tecnologia

REPÚBLICA PORTUGUESA

COFASP ERA-net

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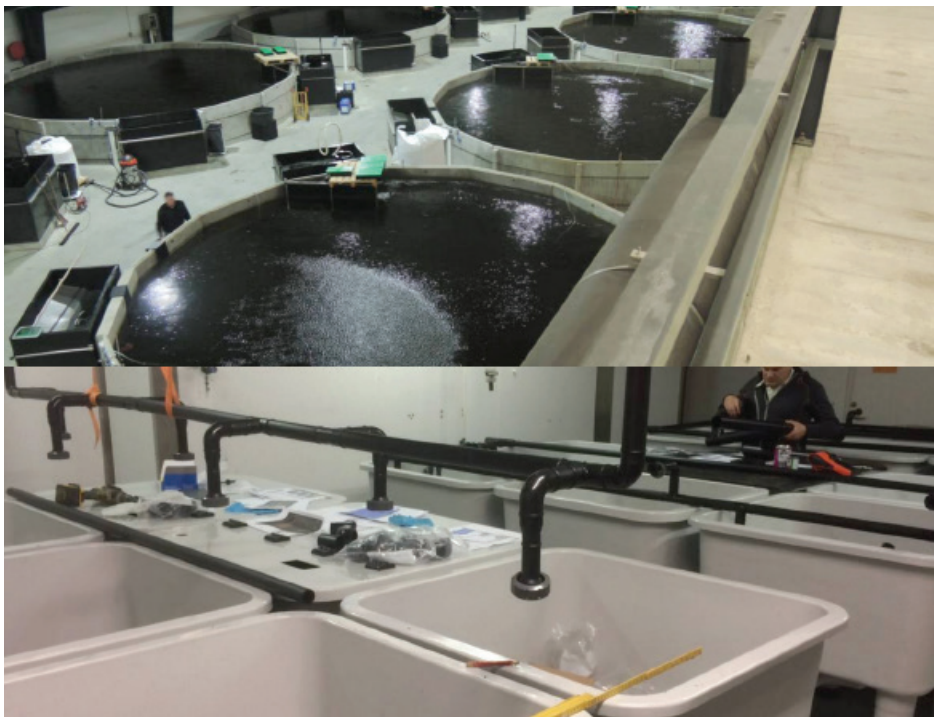
This project aims to develop strategies and water treatment technology for removal of particulate organic matter (POM) in land-based closed containment recirculation systems for aquaculture (LBCC-RAS). This will increase efficiency by reducing waste products, off-flavour compounds and carrying capacity of bacteria. Removal of POM is the key to improve the production and product quality of fish produced in LBCC-RAS. Organic matter is the determining factor of the amount of heterotrophic bacteria that can be sustained in the LBCC-RAS. Nitrification efficiency of the bio-filter is affected by the competition for space and oxygen with heterotrophic bacteria. In addition, high amounts of organic matter reduces the efficiency of both UV and ozone disinfection. Heterotrophic bacterial degradation affect the consumption of O_2, the production of CO_2 and ammonia, contribute to water colour and bacteria producing off-flavour compounds, eventually reducing the value of fish and caviar. The effects of high and low removal efficiency of organic matter on the effects on dissolved CO_2, bacteria and off-flavour prevalence will be investigated. Both tank dynamics and water treatment in the RAS loop will be used to obtain high removal efficiency. Multiple drains with optimized geometry and hydraulics will be designed for early particles collection and to be used as a strategy in combination with techniques such as advanced membrane filtration. The effectiveness of a membrane is dependent on several ambient conditions and fouling is a challenge for membrane performance. We will aim to adapt the membrane technology, optimize the operation and maintenance in a LBCC-RAS. A close collaboration with fish-producing companies safeguard that the project is applicable for commercial aquaculture.



REWATER – SUSTAINABLE AND SAFE WATER MANAGEMENT IN AGRICULTURE: INCREASING THE EFFICIENCY OF WATER REUSE FOR CROP GROWTH WHILE PROTECTING ECOSYSTEMS, SERVICES AND CITIZENS' WELFARE

[Water is a natural resource vital for social wellbeing and agriculture economy. Yet, during the past decades, geographic and climatic features, as well as active release of man-made chemicals, have been driving to water depletion and a loss of quality. This creates a major need for water reuse in increasingly situations, such as in agriculture. Wastewater treatment plants (WWTP) are crucial sources for water reuse, since they promote the removal of unwanted substances. However, one of the major challenges restricting wastewater (WW) reuse is the presence of emerging contaminants (ECs), as they are usually not properly managed by conventional treatment technologies. These technologies still need urgent innovative development and integrated solutions, in order to promote sustainable water reuse and safety.]

REWATER proposes to develop an innovative joint research and application of technologies producing a final integrated solution for reuse of WW for agricultural purposes, and their economic and environmental evaluation with a Life Cycle Assessment. This systematic approach, inspired in technological, organizational and bio-based economy, will minimize negative impacts of WW reuse in the environment, decreasing the undesirable introduction of ECs in agriculture and aquatic systems and reducing their spread within the food chain.

REWATER provides a unique interdisciplinary expertise of consortium scientific partners and SMEs specialized in WW treatment. Work programme will include tuned improvement or development of: 1) biosensors for in-field rapid and selective detection of micropollutants and their corresponding metabolites and/or degradation products (MMDs), 2) treatment processes for MMDs removal through integration of electrochemical and biological technologies, 3) ecotoxicological tools to evaluate treated water for reuse and develop expeditious surveillance, and 4) analytical monitoring, scaling-up and environmental/economic assessment. REWATER will provide tools and solutions contributing to WW reuse, environmental health, and economic and social welfare. Interaction among consortium partners, allied to stakeholders of water industry, will enhance collaborative research and innovation, as well as international cooperation in the water sector, during and beyond REWATER lifespan.

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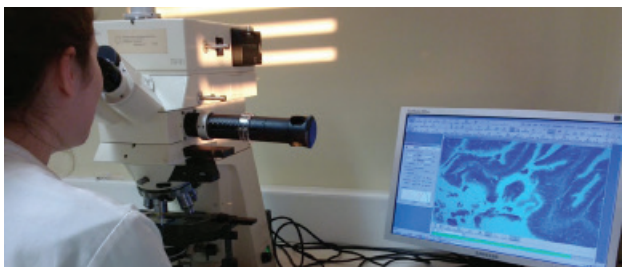

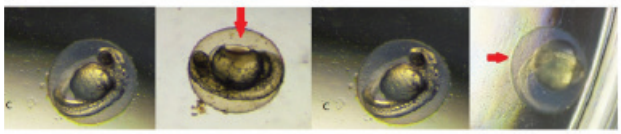

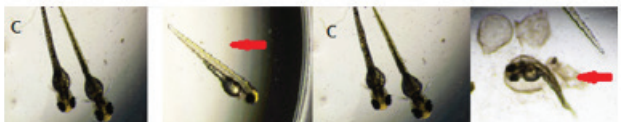

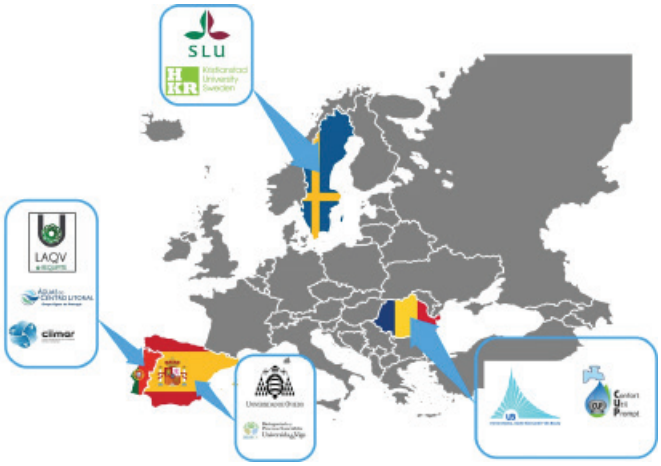

EPHEMARE – ECOTOXICICOLOGICAL EFFECTS OF MICROPLASTICS IN MARINE ECOSYSTEMS

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Lúcia Guilhermino

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Plastics, synthetic polymers virtually unknown prior to their broad commercialization in the 1950s, are nowadays ubiquitous in the environment, and their global production continues to rise. They are not biodegradable, but undergo weathering that renders their fragments more fragile, and combined to hydrodynamics produce increasingly small particles termed microplastics (MPs), within the micron to mm range, readily taken up by suspension and sediment feeders, and incorporated into the trophic webs. MPs can be toxic per se due to additives used by industry as colorants, plasticizers, flame retardants, etc. In addition, they concentrate hydrophobic chemicals, persistent pollutants (PPs), found in extremely low concentrations in seawater. The present proposal, EPHEMARE, targets (1) the uptake, tissue distribution, final fate and effects of MPs in organisms representative of pelagic and benthic ecosystems, and (2) the potential role of MPs as vectors of model PPs that readily adsorb to their surfaces. The ecotoxicological work relies on an initial study on the equilibrium kinetics of PPs on MPs conducted by a reference analytical laboratory at European level that will provide rigor and assure environmental relevance to the subsequent experimental setups. The consortium, of true trans-European composition (16 partners from 10 countries, 540 person-months), thus includes experts in biological effects of marine pollutants at molecular, cellular, physiological and organismic levels, up to-date singular facilities for aquatic toxicity testing under strict QA/QC conditions, and some of the world leading teams in MPs research. The EPHEMARE multidisciplinary consortium will allow identification of operational biomarkers with potential for MP detection in the environment, as well as omics approaches to elucidate molecular pathways causing biological effects. The composition and capacities of the partnership allow in-depth studies on fundamental mechanisms underlying these effects across the main phyla of marine organisms from bacteria to fish covering most of the trophic levels. In addition to experimental exposures, field validation studies will be performed in four areas representative of coastal ecosystems submitted to different degrees of anthropogenic pressure, thus linking the ecotoxicological findings from laboratory studies to the environmental scale. The communication and connection with private and public stakeholders, which involves 67 person-months from 14 partners, is one of the priorities of EPHEMARE in order to facilitate public awareness, pre-normative research, and implementation of European Directives.

MARINER – ENHANCING HNS PREPAREDNESS THROUGH TRAINING AND EXERCISING

Maritime transportation of chemicals has grown considerably in the last few decades. Worldwide approximately 2,000 different chemicals are transported by sea. Incidents involving the release of Hazardous and Noxious Substances (HNS) have occurred in European waters, which can present different and often more severe impacts than oil spillages. HNS spills can be particularly challenging due to the complexity of the identification and assessment of the cargo and associated risks and hazards, and the lack of knowledge on HNS behaviour in the marine environment. Parties signed up to the International Convention on Oil Pollution Preparedness, Response and Cooperation (OPRC) HNS protocol are required to establish measures for dealing with pollution incidents. Under this protocol, HNS contingency arrangements and response mechanisms have to be implemented by the signatory countries and associated authorities. Mariner project is focused mainly in improving ecological risk assessment of HNS and in its implementation at operational level.

The key to effective contingency planning is to provide ready access to relevant information, knowledge and resources to facilitate regular training and contingency mechanisms. The MARINER project intends to address these issues, focusing on improving planning, preparedness and response to HNS spills in Europe by:

- Capitalizing and translating relevant HNS R&D outcomes into operational resources
- applicable by planners and contingency authorities;
- Improving training and exercise capabilities;
- Upgrading and/or improving tools to support decision making and response;
- Increasing awareness and encouraging information exchange.

The MARINER project is divided into different activity areas:

- Knowledge compilation and facilitation.
- Modelling and environmental impact.
- Response protocols.
- Training.
- Outreach and communication.

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SPILLESS – FIRST LINE RESPONSE TO OIL SPILLS BASED ON NATIVE MICROORGANISMS COOPERATION

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Ana Paula Mucha

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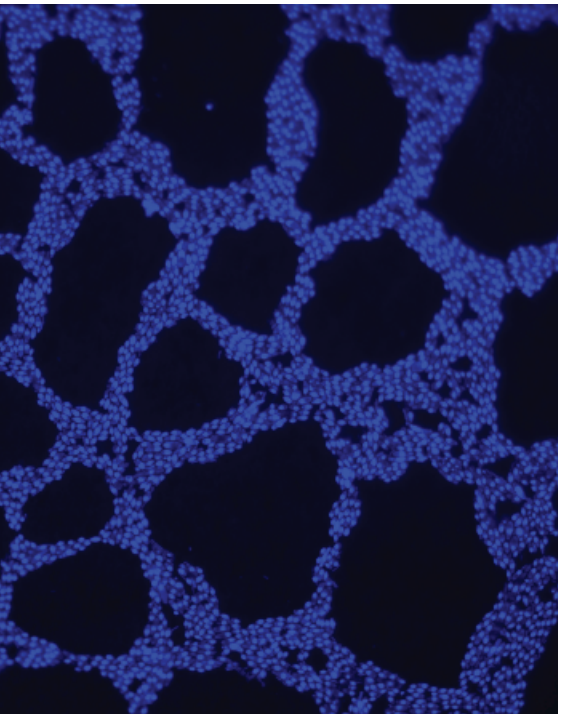
spilless.ciimar.up.pt/

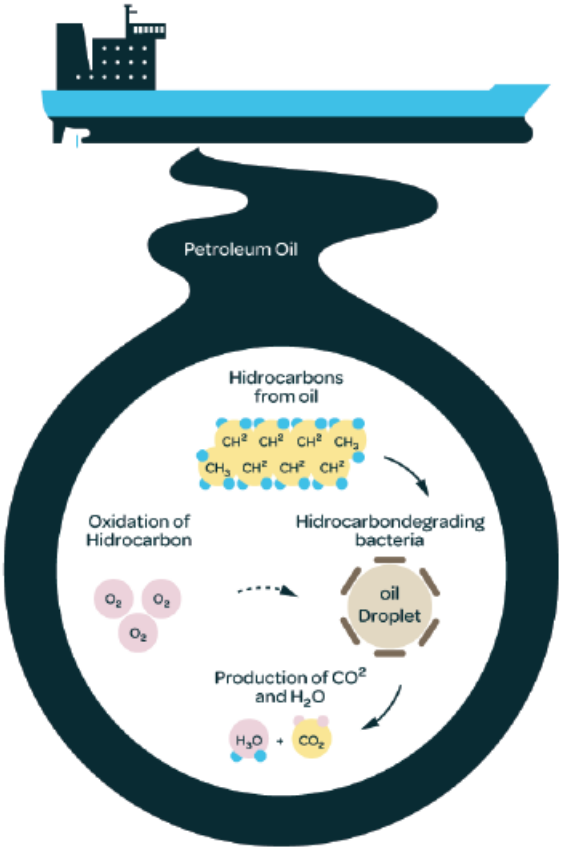
UNIÃO EUROPEIA
Fundo Europeu de Desenvolvimento Regional

SpilLess aims to implement an innovative 'laboratory' (Blue Lab) to pilot new and viable solutions to tackle with one of the most damaging sources of maritime pollution: oil spills. These solutions will be based on the production of native microbial consortia with bioremediation capacity, and the adaptation of unmanned and autonomous vehicles for in-situ release of autochthonous microorganisms (bioaugmentation) and nutrients (biostimulation).

This Blue Lab will have a multidisciplinary profile. It will be established by a team of young scientists, and supported by senior researchers from three institutions (CIIMAR, INESC TEC and the University of Vigo) and experienced business tutors from three private companies (ACSM, Biotrend and MARLO). Besides, the R&D team will be advised and mentored by a stakeholder's platform that includes several public and private entities. SpilLess will be implemented in the region of the Atlantic Ocean, with potential for transferability to other regions facing similar challenges.

This solution will be environmental-friendly, will be able to act as fast first line response with low time to reaction and mission costs, will set-up holistic pollution combat and will provide environmental monitoring.





MIGRAMIÑO-MINHO – PROTECTION AND CONSERVATION OF MIGRATORY FISH IN THE INTERNATIONAL SECTION OF MINHO RIVER AND ITS TRIBUTARIES

The MIGRA MIÑO - MINHO project proposes as main challenge to improve the protection and sustainable management of the natural boundary area that forms the sub-basin of the international section of the Minho River

MIGRA MIÑO - MINHO aims to improve the protection and conservation of river habitat of the sub-basin of the river Minho, from the Frieira Dam (province of Ourense) until its mouth, with actions to improve the conservation status of river beds and migratory fish species present in the Minho River and its tributaries.

In addition to the environmental component, this project aims to solve the socio-political aspects of protecting and improving the natural state of the international river Minho, through the conservation of one of the most threatened key elements - the migratory fish species. This will contribute to the preservation and exploitation of traditional fishing activities, as well as the improvement of sustainable socio-economic development of cross-border territory, by of commercial activities such as fishing, tourism or energy sector.

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MarRISK – COASTAL ADAPTATION TO CLIMATE CHANGE: KNOWING THE RISKS AND INCREASING RESILIENCE

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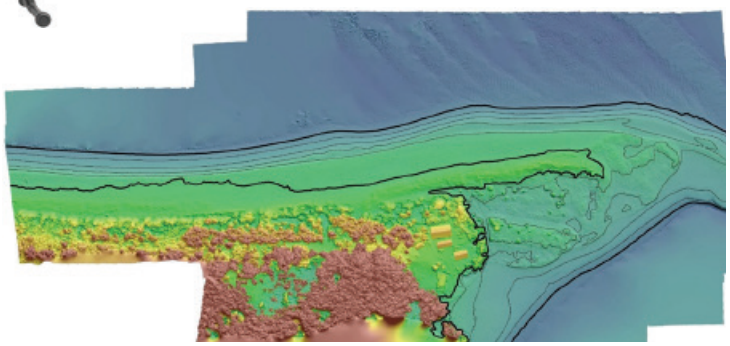
MarRISK aims to ensure an intelligent and sustainable growth of the Galician and Portuguese coastal zones through evaluation of the coastal risks that are most important in terms of climate change scenarios.

Floods, intensification of extreme events, toxic algae blooms and coastal erosion are examples of the risks that shall be analysed in order to improve the resilience of traditional economic sectors and of other, emerging sectors, like marine renewable energies.

This way, the adaptation of the cooperation region to potential disasters will be improved, and applications and services to guarantee a coordinated response will be developed, given that environmental risks require a cross-border approach.

MarRISK shall evaluate coastal climate evolution, at a better resolution than is presently done, and will enable monitoring and warning systems. MarRISK will deliver decision support tools to public authorities, the productive sector and the general public, to improve coastal management.



MARINEYE – A PROTOTYPE FOR MULTITROPHIC OCEANIC MONITORING

MARINEYE
WATCHING FOR THE OCEAN

Increasing our understanding of the complex exchange among processes throughout ocean basins is severely limited by the paucity of infrastructures able to support sustained and interactive observations of the biological, chemical, physical, atmospheric and geological processes. Because all these processes interact in the ocean in complex ways, promoting a more fundamental scientific understanding of these relationships requires new and transformational approaches to ocean observation. In this project we are developing an autonomous system for integrated marine chemical, physical and biological monitoring – MarinEye. This system combine high-resolution imaging, acoustic, sonar, fraction filtration systems and sensors in a modular, compact system that can be deployed on fixed and mobile platforms. Thus, the autonomous monitoring system that is being developed combines a range of technologies capable of providing data that gives an integrated view of the different compartments of the ocean (physical, chemical, biological) at different levels of knowledge (from genomics to biogeochemistry and from micro to macro community dynamics) but synchronized in time and space. The capability to simultaneously monitor biological, chemical and physical data provides the ability to answer questions about how organisms interact with their environment and with each other, and how these interactions influence the overall ecosystem stability. MarinEye also includes a centralized data base infra-structure that will aggregate all the diverse data sources (physical, chemical, biological) collected by the different modules. This data base feeds a platform of data visualization and summarization that can provide synthetic summaries of the main events of the system in order to simplify data analysis. Moreover, the platform also implements several modelling tools that have as main goal to uncover unsuspected and useful patterns that may exist on the physico-chemical and biological data sets generated. This device will increase oceanic knowledge, complementing the already existent ocean observatories by providing novel integrative data not currently supplied. Marineye will give an extremely important contribution for the consolidation of infrastructures dedicated to the observation of the marine environment.

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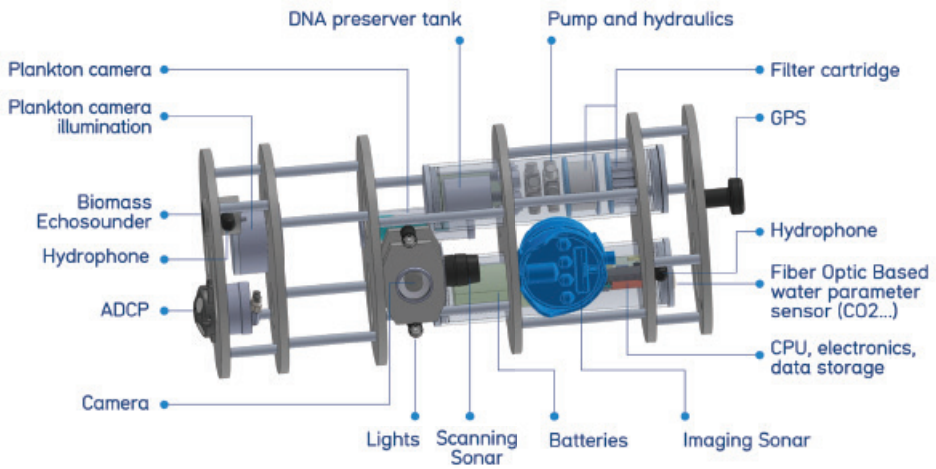

SENSORY-OMICS – ANIMAL SENSORY DIVERSITY: INNOVATIVE GENOMIC SOLUTIONS TO ENHANCE PERCEPTION OF ENVIRONMENTAL STIMULI

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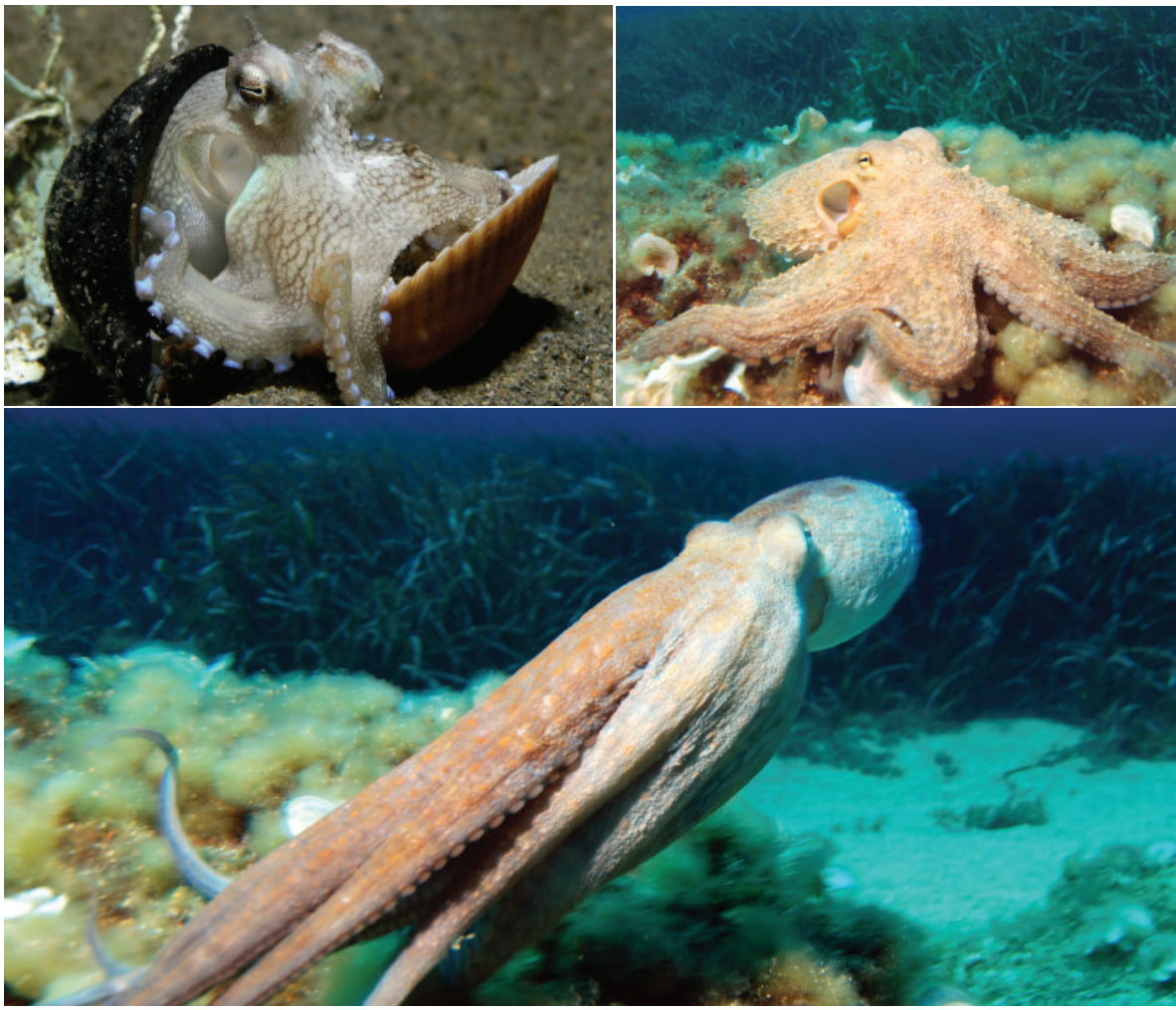
Animals are equipped with specialized sensory organs fundamental to their interactions with a rich multisensory world through the perception of chemical (smell and taste) and physical (mechanical, sound, vision and temperature) stimuli. These systems diversified over more than a half billion years to produce an array of sense organs with multiple functions. By contrast, disruption of sensory genes can have serious repercussions (e.g. winter depression due to disturbance in circadian clock regulation, varied sensitivity to sweetness and obesity, and photoreceptor degeneration associated with visual disorders). In this project, an omics approach will be use to assess the molecular mechanisms underlying animal sensory including associated genetic malfunctions. This may lead to a wide range of applications with relevance for environmental and biomedical research.



CYANOTOX – ASSESSMENT OF CYANOBACTERIAL TOXINS IN AQUATIC SYSTEMS: ENVIRONMENTAL IMPACTS AND DEVELOPMENT OF NEW METHODOLOGIES FOR THEIR EARLY DETECTION

Harmful algal blooms are a global threat to the aquatic ecosystems worldwide. Besides diminishing the water quality the release of toxic bioactive compounds (cyanotoxins) that are produce by those algal blooms seriously affect the human and animal welfare that depend on those water systems. With several reports on the morbidity and mortality in both humans as well as animals documented worldwide its repercussions on the environmental health is also another great impact that these compounds carry. With different modes of action cyanotoxins are known to target and harm specific organs and can be classified as hepatotoxic, neurotoxic and dermatotoxic. Hepatotoxins act on the liver and include the microcystins, cylindrospermopsin and nodularin. Meanwhile neurotoxins act on the nervous system and include the anatoxins and saxitoxins. Finally the dermatotoxins act on the skin and include aplysiatoxin and lyngbyatoxin-a. Currently the available methodologies allow together the identification and quantification of the existing cyanotoxins as well as the species or genera that are producing them in any given environment. Though analytical methods are those that allow the toxic evaluation in any given environment through its quantification it is with the molecular screening that the presence of potentially toxic cyanobacteria species indicates the capability of at any given moment the occurrence of toxicity in that same environment. In this sense these latter constitute with no doubt until now a valuable tool in the first assessment of the toxic potential in any given sample being currently well established in the reports of cyanotoxins globally. As a result we propose to develop new tools (primers) that will optimize the implementation of these methods in a direct environmental assessment of cyanotoxicity with the simultaneous detection of the organism involved. To achieve this several water systems throughout Portugal (Rio Tâmega, Parque da Cidade do Porto, Lagoa da Vela and Lagoa de Mira) will serve as a working area where the application of these new tools will be evaluated. Their validation by comparison with the analytical methods aims in its future use in both research and environmental assessment.

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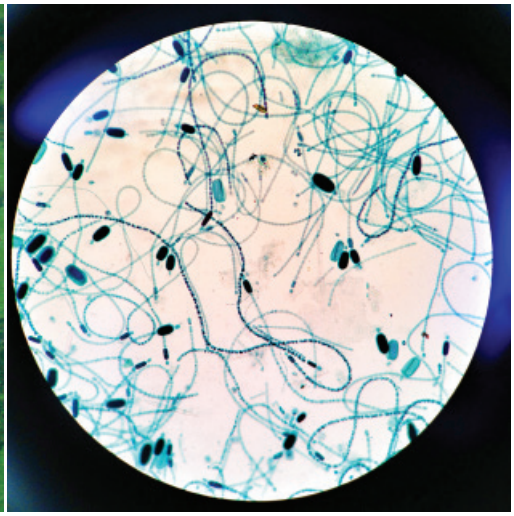

ANTIINCRUSTANTE – OVERCOMING ENVIRONMENTAL PROBLEMS ASSOCIATED WITH ANTIFOULING AGENTS: SYNTHESIS OF NATURE-INSPIRED NONTOXIC BIOCIDES AND IMMOBILIZATION IN POLYMERIC COATINGS

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We currently do not have a viable option for widespread replacement of copper in antifouling paints. Marine Environment Protection Committee (MEPC) alerted to the severe ecological consequences when no acceptable alternatives exist, namely, acceleration of green house and acid rain effects, due to higher heavy oil consumption, and trans-global contamination of ecosystems with exotic organisms. So, there is a practical and urgent need of identifying innovative environmentally friendly and nontoxic technologies to combat biofouling. Marine natural products have been considered as one of the most promising sources of antifouling compounds in recent years. For example, zosteric acid, which is a p-sulfated cinnamic acid derived from the marine angiosperm *Zostera marina*, has received much attention as a potential natural product antifoulant. Zosteric acid is fully biodegradable and possesses a half-life in seawater of a few days but the compound has high water solubility and its release from conventional antifouling paints is difficult to control. The team of this project developed a technology to synthesize innovative zosteric acid-inspired compounds, and a new immobilization technology to incorporate them in polymeric coatings. The combination of these two technologies can provide an important contribution to overcome the current limitations on biofouling control.

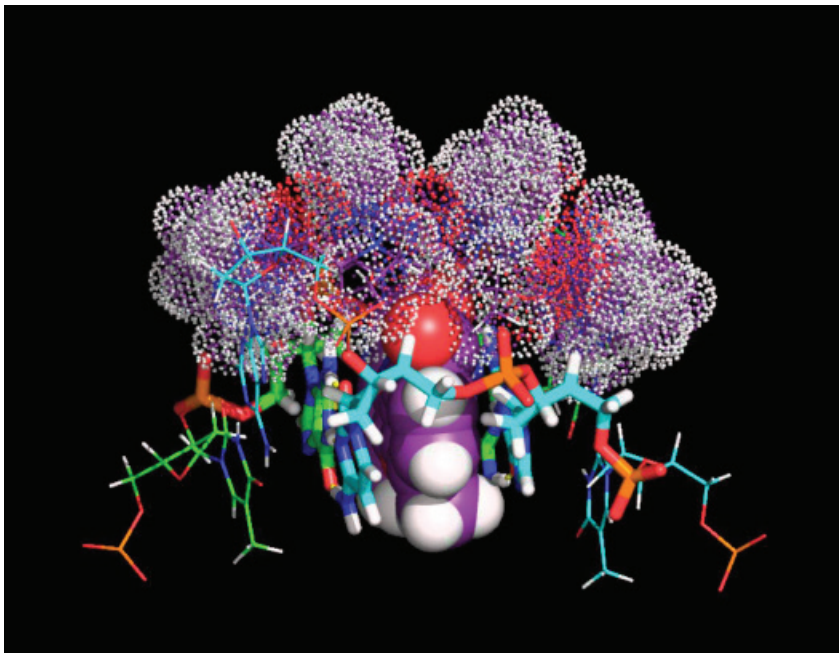
QUIMIOCARDIOTOX – POISONING THE HEART WITH ANTICANCER DRUGS: IS METABOLIC BIOACTIVATION OR AGING PROMOTION THE LINK TO THE CARDIOTOXICITY OF ANTICANCER DRUGS?

Anticancer therapy should be considered a cardiovascular risk. The number of cancer survivors is hugely increasing, as well as chemotherapy-related long term cardiotoxicity, namely heart failure (HF). HF strongly impacts on the life of quality and life-expectancy of cancer treated patients and it is a heavy burden to the health care systems. The prosecution of early cardio-protective therapy is critical for the success of cardiac treatment. However, available biomarkers of cardiotoxicity are poor predictors of early cardiotoxicity or very challenging and costly. Anthracyclines [e.g. doxorubicin (DOX)], cyclophosphamide (CTX), and mitoxantrone (MTX)] are first hand clinical weapons on cancer (MTX and CTX also have other clinical uses). They are major causes of chemotherapy-related HF and overall cardiotoxicity, which can reach up to 30% of patients. The cardiotoxicity mechanisms of anticancer drugs are largely unknown at this point and the discovery of early biomarkers of anticancer drugs-induced cardiotoxicity will be of great clinical value. Drug metabolism of aging may be potential biomarkers of early cardiotoxicity. Although a link between cardiotoxicity and drug metabolism has not been yet stablished for most drugs, the metabolites of DOX and CTX may be involved in their cardiotoxicity. MTX-metabolism increased the drug's cytotoxicity. On the other hand, aging and HF share some characteristics and MTX increased markers of cardiac aging, namely impaired proteasome activity, increased protein carbonylation and fibrosis.

In this project we aim to answer to the following questions: Is anticancer drug metabolism a crucial factor for the development of cardiotoxicity? Are anticancer drugs promotors of cardiac aging? Drug metabolism profile and cardiac aging markers can be very valuable candidates for early detection of cardiotoxicity, allowing early clinical intervention and therefore increasing patient's quality of life.

To answer to the proposed questions and find new early cardiac biomarkers, 7 tasks are planned with a broad team and multidisciplinary techniques.

We expect to clarify the role of drug metabolism on the cardiotoxicity of anticancer drugs thus finding which are the most cardiotoxic metabolites; and determine if anticancer drugs promote cardiac aging. Plasma/cardiac drug levels or their metabolites, as well as aging markers can be valuable biomarkers to determine early cardiotoxicity of anticancer drugs, allowing effective cardio-protective measures.



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ACTONP53 – TARGETING P53 FAMILY PROTEINS ON THE ROUTE TO NEW ANTICANCER AGENTS

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Cancer is among the leading causes of morbidity and mortality worldwide. The efficacy of the available anticancer chemotherapy remains quite limited, and generally associated with increasing drug resistance and severe side effects. The discovery of new anticancer agents is therefore a major medical priority. The p53, p63 and p73 tumor suppressors are key therapeutic targets in cancer. Inactivation of these p53 family proteins by interaction with MDM2 and MDMX, and mutation of p53 are common events in human tumors, leading to two major anticancer therapeutic strategies: inhibition of the MDMs interaction with p53 family proteins, and mutant (mut) p53 reactivation. To date, most of the pharmacological efforts have been focused on the p53-MDM2 interaction, with only one small molecule inhibitor of p53-MDMX interaction and three p53-MDM2/MDMX dual interaction inhibitors reported. Inhibitors of p63/p73-MDMs interaction are still mostly unknown. The identification of reactivators of mut p53 brought new expectations to the therapy of tumors expressing mut p53. Moreover, the discovery of mut p53 oncogenic gain-of-function (GOF), mainly through interaction with transcriptionally active p53 family proteins, led to a new promising anticancer strategy.

In previous works, we developed innovative targeted screening assays, combining yeast and human tumor cells, which led to the identification of hit small molecule activators of p53 family proteins.

With this proposal, we aim at fully developing the potentials of our approach and recent results. Particularly, we intend to:

1. Gain knowledge into mut p53 biology in the context of its gof

2. Develop anticancer drug candidates activators of p53 family proteins

3. Design effective combination therapies with conventional chemotherapeutic drugs

4. Develop a targeted drug delivery nanosystem for efficient and selective delivery of our drug candidates into tumor cells

5. Validate the antitumor properties of our anticancer drug candidates in genetically-characterized patient-derived xenograft (pdx) models

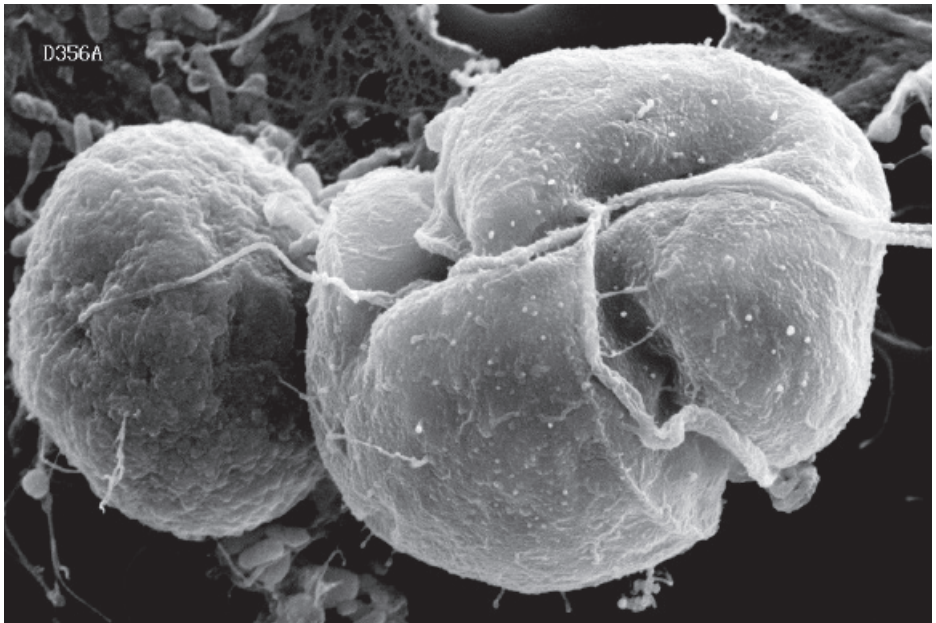
Collectively, relevant advances in anticancer therapy are expected to emerge from this project.

DINOSSAUR – DINOFLAGELLATES FOR SUSTAINED SUPPLY OF ACTIVE COMPOUNDS IN OPTIMIZED PHOTOBIOREACTORS

The long lasting interest on dinoflagellate microalgae for their being sources of marine biotoxins affecting seafood safety, has boomed in recent years due to their unexpected application as pharmacological drugs. This is the case of *Karlodinium* genus, exhibiting the unique feature of synthesizing karlotoxins (with chemical structures recently resolved) with a noteworthy medical potential. Karlotoxins trigger formation of pores in cholesterol-containing cell membranes, thus disrupting osmotic balance and causing lysis; besides their obvious role as hypocholesterolemic pharmacore, karlotoxins may be used as antitumor agents. Therefore, our model biocatalyst and metabolite are well-defined – but productivity of the latter is far from acceptable, thus constraining clinical testing and industrial production.

Large-scale chemical synthesis of karlotoxins is exceedingly complex; and the genome of their source dinoflagellates is unusually long and complex, thus hampering genetic and metabolic engineering. Culture in photobiorectors is thus the only realistic option to obtain significant quantities of those compounds. However, said microalgae are fragile and grow slowly, so classical (closed) photobioreactor configurations and operating conditions are not appropriate at all. Building on the somewhat scattered information on lab-scale cultivation of other dinoflagellates, novel photobioreactors will be designed, and operating conditions will be tuned – thus constituting the core innovation of this proposal.

In view of their great contribution to global processing costs in blue biotechnology, downstream separation techniques will also be addressed – toward novel solutions, or optimization of classical methods of harvesting, dehydration and disruption of biomass, extraction and purification of karlotoxins leached, and polishing of final commercial product. We will expand on the existing portfolio of post-reactional handling methodologies – so as to develop dedicated techniques, suitable and optimized for a new class of compounds with pharmaceutical interest; and will assess the overall environmental impact and economic feasibility, after tentative scale up.



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NANOBINDERS – BIOGENIC POLYMERIC NANOPARTICLES FUNCTIONALIZED TO BIND METALS FOR ECO-FRIENDLY APPLICATIONS: BIOREMEDIATION AND BIOSENSORS

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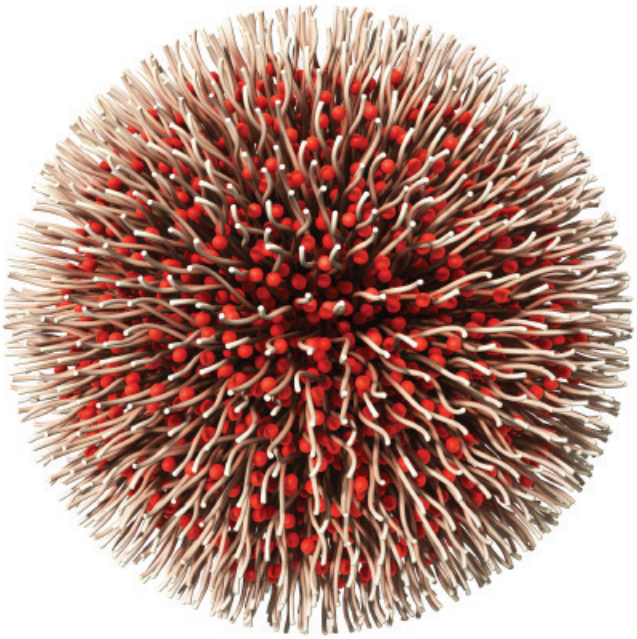
The exploration of uranium in Portugal from 1908 to 2001 resulted in huge hotspots of metal exposure. Despite the overall success of conventional remediation works to counteract the associated risks, there are still mine effluents and/or nonpoint discharges (leaching/runoff events) jeopardizing adjacent aquatic systems. Bioremediation has been an excellent alternative, being primarily focused on microbial potential. But the direct use of living organisms may fail to succeed due to their reduced tolerance ranges. As such, the NANOBINDERS project will address the creation of biogenic, biodegradable and non-toxic polymeric nanobeads with high potential for metal biosorption in water - the NANOBINDERS. These nanobeads will be self-tailored inside engineered bacteria, being the biosynthesis optimized through the use of low-cost carbon sources obtained from waste recycling. The bioremediation potential of NANOBINDERS will be validated in small-scale systems set under laboratorial conditions. The NANOBINDERS will be further explored as biosensing elements for the monitoring of bioremediation efficiency, as well as metal exposure in water. In order to accomplish these goals, the project will bring academia and industry together, by gathering experts from different scientific areas and the company EDM (Empresa de Desenvolvimento Mineiro, SA).



BIOLOGICAL PRODUCERS OF NATURAL FLUORINATED COMPOUNDS AS A NOVEL SOURCE OF RELEVANT DEGRADING MICROORGANISMS AND BIOSYNTHETIC MECHANISMS

Fluoroorganic compounds are finding increasing uses in several applications, thriving in virtually all areas of our society. As a consequence of their diverse uses, these compounds are becoming widespread environmental pollutants and, thus, studying their biodegradation is essential in order to assess their fate in the environment and also to understand their biotransformation mechanisms.

In contrast to this abundance of man-made fluorinated structures, there are very few natural fluorinated compounds with a biological origin. Far as is known, these structures resume to a few monofluorinated compounds that are produced by some tropical and subtropical plants and by a handful of actinomycetes species, with fluoroacetate (FA) constituting the most common produced natural fluorinated compound. This dearth of biogenic fluoroorganics makes the research in this area highly fascinating and extremely attractive for the scientific community, offering an excellent opportunity to find new fluorinated structures or biochemical mechanisms commercially important. There are some evidences suggesting that these natural producers of fluoroorganic molecules, especially FA producing plants, may constitute a good source of microorganisms capable of degrading and/or producing fluorinated compounds. In this context, the present project aims to explore biological producers of fluorinated compounds in order to find efficient fluoroorganics biodegrading activities, namely for compounds structurally related with FA, and, at the same time, to search for potential microbial producers of these compounds.

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QUIMIOTERÁPICOS - NAVIGATING THROUGH MARINE-DERIVED FUNGI: BIOPROSPECTION AND SYNTHESIS OF BIOACTIVE SECONDARY METABOLITES AND ANALOGUES AS CHEMOTHERAPIC AGENTS

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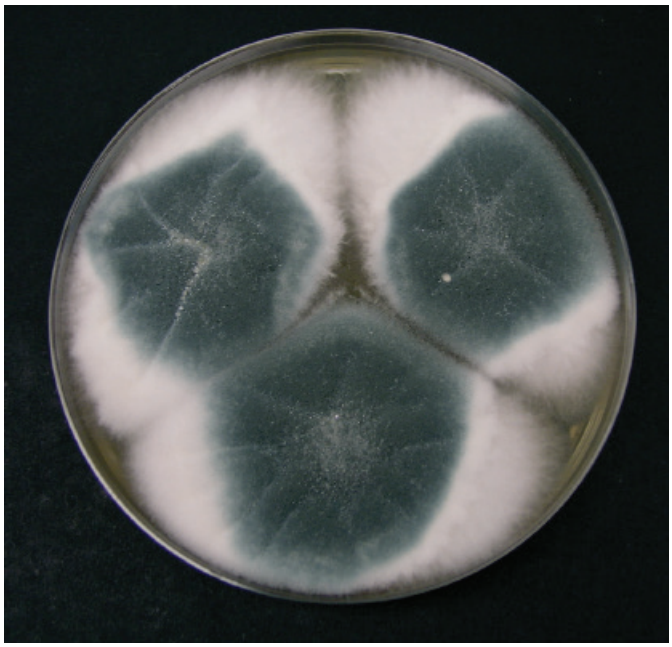
The need for a continued search for new anti-infective and anticancer drugs is universally considered of great importance since many of the current drugs are insufficiently effective, highly toxic, and resistances may be developed. Two alkaloids, being eurochevalierine a potent inhibitor of the growth of human tumor cell lines, were isolated from the soil fungus *Neosartorya pseudofischeri*, and neofiscalin A from the soil and marine fungus *N. siamensis* with potent antibacterial activity. *Neofiscalin A* exhibited also antibiofilm activity in both reference and multidrug-resistant isolates, and is currently in the patent filing process. These compounds and their derivatives are under study in order to obtain quantities as well as for more biological assays. On the other hand, marine fungi derived xanthones, particularly yicathins and isomers were considered promising as chemotherapic agents.

So, *eurochevalierine*, *neofiscalin A* and *yicathins* can be considered very interesting models to discover new anti-infective and anticancer drugs to overcome drug-resistance that could represent innovative drug candidates. However, their availability to proceed to further investigations and their complex structures could limit their future as drug candidates. Our goal is not only to continue with the search for innovative marine-derived compounds but also to obtain derivatives/formulations of the most promising compounds to obtain more efficient analogues and more effective delivery systems.



PRE-NEURO-HD – TARGETING HUNTINGTIN PROTEOSTASIS AND MITOCHONDRIA TO PREVENT NEURONAL DYSFUNCTION IN HUNTINGTON'S DISEASE

The major aim of this project is to address the involvement of mitochondria in Huntington's disease. CIIMAR has been involved in the molecular tasks of the project, in particular in the study of the affected molecular pathway following exposure to pharmaceuticals impacting normal mitochondria functions.

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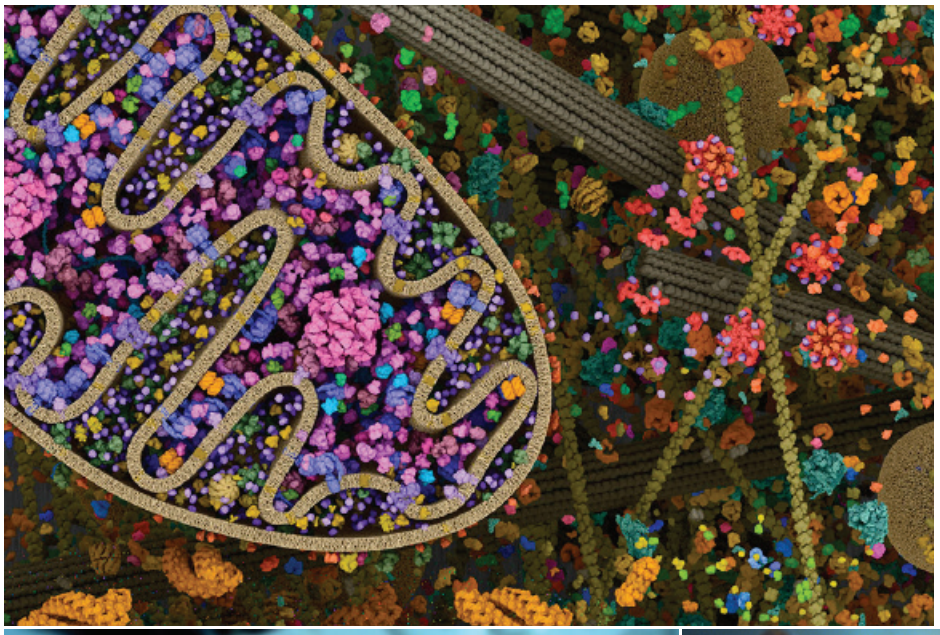

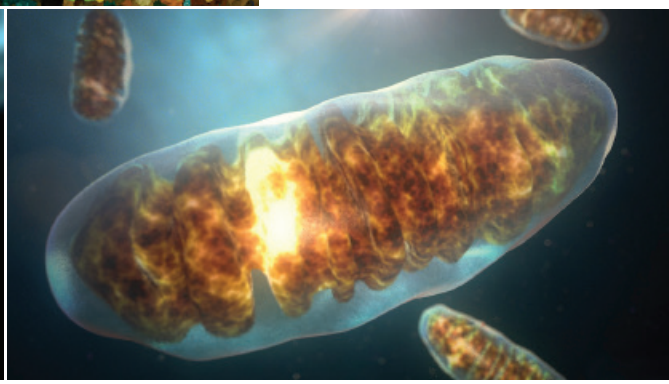

ZEBRALGRE – FROM ZEBRAFISH TO MEAGRE: USE OF MACRO- AND MICROALGAE AS FUNCTIONAL FEEDS

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Patricia Díaz-Rosales

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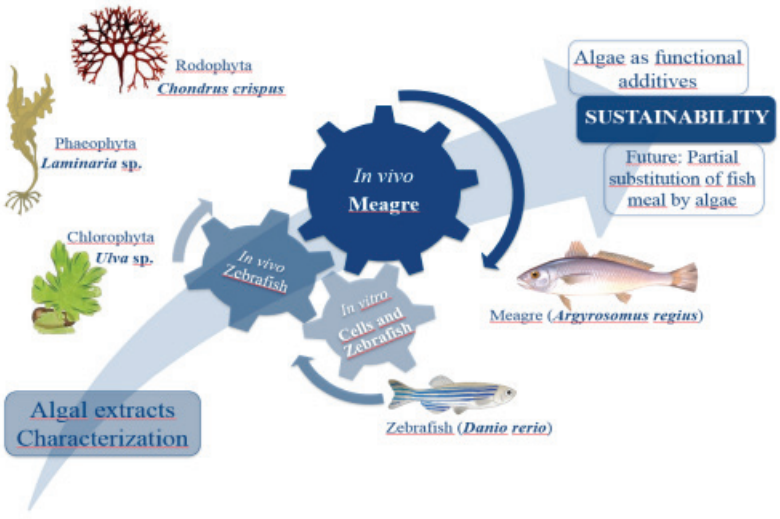
The project undertakes multidisciplinary research in order to contribute to the development of sustainable aquaculture in Portugal. The diversification in aquaculture species is essential for development of a competitive industry, and meagre has become one of the most attractive candidates for diversification, due to its excellent biological characteristics, high rates of growth, feed conversion and fertility.

The increasing of intensive culture of meagre is at risk from a range of common disease agents, such as bacterial, that impact on other species production. During the last years, attention has been focused on marine organisms as a source of substances of therapeutic interest for the prevention and prophylaxis of farmed fish diseases, reducing the use of antibiotics.

The main objective of the present project is combining the advantages of macro- and microalgae bioactive compounds for inclusion as functional feeds in fish diet. Several autochthonous macro- and microalgae extracts are characterized in terms of bioactivity and their effects on fish growth and health are explored, in order to serve as a basis for further research on the use of selected algae biomass as functional ingredients in fish feed formulations and, ultimately for product commercial development.

Thus, the project is divided in two main research lines: production and characterization of macro- and microalgae, as well as the study of their biological activities in vitro, using cell cultures; and, on the other hand, evaluation of the effect of the diet algae incorporation on growth performance and immune status of meagre, taking advantages of zebrafish as experimental animal model. Validation of zebrafish as model in fish nutrition trials allows more cost-effective and less time consuming studies, contributing to future research. In addition, it is expected to gain a great deal of information on meagre genomics, a resource that will be useful for future studies with this valuable species.

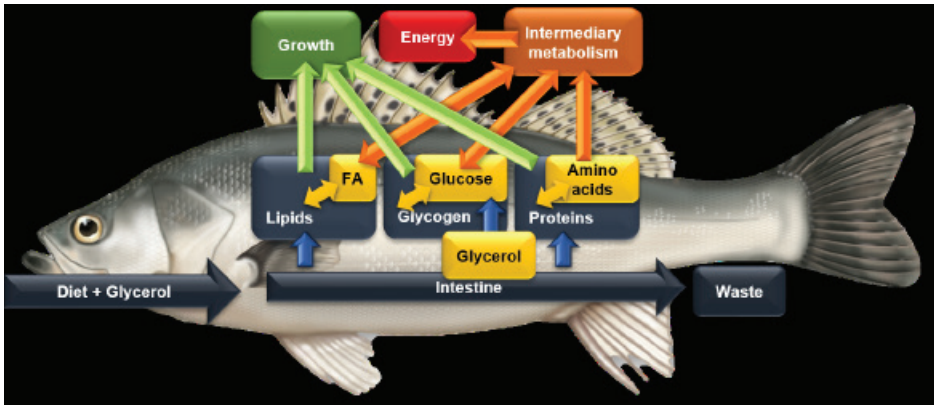


PEIXEROL – GLYCEROL AS AN ALTERNATIVE INGREDIENT FOR FISH FEED AND ITS POTENTIAL FOR AQUACULTURE

Aquaculture remains highly dependent on fishmeal protein and its supply contingent on the exploitation of wild fisheries. Any reduction in its utilization by farmed fish would reduce the ecological burden of aquaculture and improve its sustainability. For the intensive farming of fish species, the provision of alternative ingredients that reduce dependence on fishmeal protein yields yet other significant environmental benefit: decreasing the dietary protein nitrogen catabolism and consequently effluent ammonia produced by fish farms. This could mitigate the impact of this industry on the ecosystems which are particularly vital in Portugal, since most fish farms are installed in transitional waters.

Glycerol, a by-product of biodiesel, is an abundant and widely available material. It has been successfully used as alternative ingredient for the swine and poultry industry. However, its potential as an alternative ingredient for fish feed has been generally overlooked. This project will investigate the metabolic utilization of dietary glycerol and its effect on fish performance, digestibility and ammonia excretion, which will allow a better understanding of the underlying biochemistry of glycerol utilization, particularly in carnivorous fish species. In liver, the excess of dietary amino acids appears to be largely directed to the intermediary metabolism and the synthesis of glucose, converting their nitrogen moieties into ammonia. In carnivorous fish, gluconeogenic catabolism of amino acids accounts for essentially all endogenous glucose production. The provisions of an alternative non-nitrogenous substrate such as glycerol in commercial diets, could either directly or indirectly attenuate amino acid utilization.

The environmental and economical benefits of feeding carnivorous fish glycerol-supplemented diets are clear. Fishmeal could be partially replaced by a less expensive, non-nitrogenous ingredient readily available on the global market, therefore reducing feed costs, a major contributor to the operational budget of any fish farm.



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LEADER INSTITUTION
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ALGAFISH – INCLUSION OF MICROALGAE IN SEA BASS DIETS: BOOSTING IMMUNITY THROUGH NUTRITION

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Ana Couto

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CIIMAR-UP

The aquaculture feed industry requires suitable and sustainable ingredients alternative to fishmeal and fish oil. Microalgae are potential candidates, particularly because of their long-chain polyunsaturated fatty acids (namely omega-3 fatty acids) and other bioactive compounds with immunostimulant, antioxidant or probiotic function.

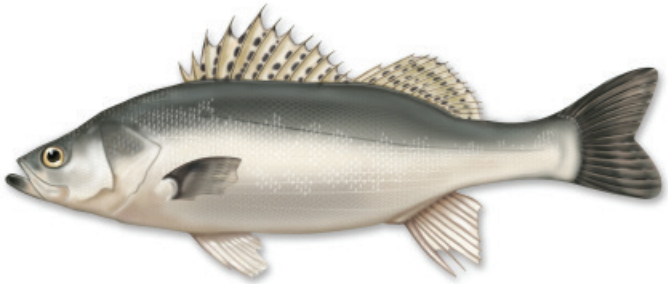
Microalgae already being produced in a Portuguese biorefinery will be tested for their nutritional value as ingredients in sea bass diets. Sea bass is an important aquaculture species largely exploited in the Mediterranean countries.

Microalgae will be tested as functional ingredient in marine fish aquafeeds, and its putative beneficial effect in fish health and welfare evaluated. Animal health and welfare is a pressing issue in animals reared in captivity, since healthy and stress-free animals are less prone to diseases. In aquaculture the high rearing densities together with the aquatic medium surrounding fish, facilitates the propagation of diseases. Thus, nowadays, aquafeeds are expected to deliver not only the required nutrients for maximization of fish performance, but also functional ingredients that guarantee fish health and welfare.

Since fish are claimed to be beneficial for human health due to their fatty acid profile, namely omega-3 fatty acids, known for their effects in cardiovascular diseases prevention, Algafish will evaluate if the valuable components of microalgae are being incorporated in fish flesh.

In conclusion, the use of microalgae is expected to contribute towards more cost-effective and eco-friendly aquaculture. Both outcomes are in line with the Portuguese and European strategies for sustainable development of aquaculture.

Aquafeeds of the future are expected to impart dual benefits of good growth and health to the farmed organism, and preventive health care through nutritional means is certainly a strategy to ensure sustainability in aquaculture.



CARDIOFISH – EFFECTS OF DIETARY COMPONENTS AND HOLDING CONDITIONS ON ENERGY USE AND OXIDATIVE STRESS IN FISH

Fish may be exposed to changes in holding conditions (e.g. variations in salinity, water circulation, dissolved oxygen levels), which have impact on several productive parameters in aquaculture. Such changes may act as stressors, enhancing the generation of reactive oxygen species (ROS) in the mitochondria of several tissues, with a subsequent risk of oxidative damage. There is a clear interest in the fish farming sector for maximizing growth, while minimizing the potential negative effects of holding conditions on fish performance and welfare. Nutritional manipulation has been advocated as a means to decrease oxidative stress in health and disease, particularly in mammals. However the implementation of this practical approach has not been investigated until now in fish in spite of the possible application in the aquaculture industry.

Seaweeds (SW) have been found to contain compounds with scavenging effects which decrease ROS formation in animal tissues. The addition of small quantities of SW and/or their extracts in fish diets may affect metabolic fuel utilization in the tissues and could prove to increase antioxidant defenses protecting against the negative effects of ROS formation, improving welfare and resulting in better economic performance. On the other hand, the degree of unsaturation of fatty acids (FA) included in the diet may also affect ROS generation in fish tissues.

This project investigates the possible modulatory effects that several experimental diets (supplemented with SW or including FA with different degree of unsaturation) have on the energy use and oxidative stress response of fish by investigating responses to a number of potential stressors related to changes in holding conditions.

PRINCIPAL INVESTIGATOR AT CIIMAR
Leonardo J. Magnoni

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UNRAVELLING THE FUNCTIONAL IMPORTANCE OF AMINO ACIDS IN THE FISH NEUROENDOCRINEIMMUNE NETWORK

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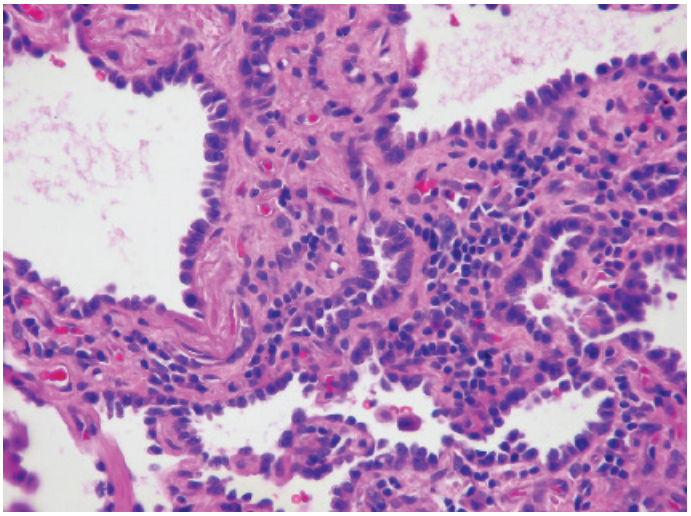
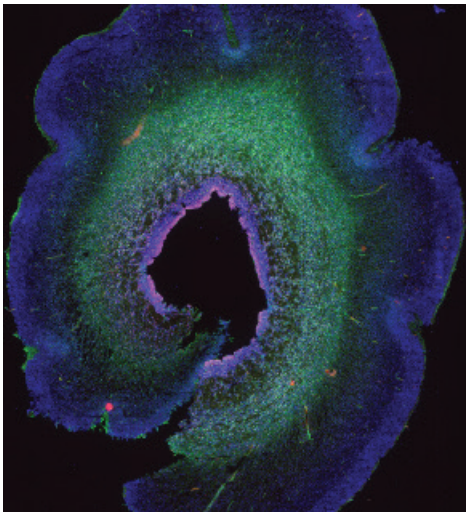
CIIMAR-UP

Amino acid requirements may increase as a direct consequence of metabolic changes associated with distress and infection in higher vertebrates. However, little is known about the specific fate of amino acids arbitrating the elaborate neuroendocrine-immune network. The present project will use an innovative multidisciplinary approach that aims to explore the links between amino acids nutrition and neuroendocrine-immune plasticity. State-of-the-art methodologies will be employed through *in vitro* and *in vivo* approaches with special attention given both to the first steps of stress perception (including infection) and chronic stress. The applicant will focus on the pathways, receptors and mechanisms involved in teleost fish which form an excellent model to reveal phylogenetically old and original mechanisms of stress physiology and immunology. The transcriptional and proteome analyses proposed in the present project will also be suited for the identification of new biomarkers of acute and/or chronic stress responses, which may provide the basis for the development of operational welfare indicators in order to monitor and safeguard the welfare of farmed fish. Knowledge gathered from the present application should allow the improvement of functional commercial diets for farmed fish, hence improving aquaculture profitability in terms of disease resistance.





EICOBREAM - EFFECT OF FATTY ACID SOURCE (N-6 VS. N-3) ON THE EICOSANOID CASCADE AND INTESTINE INFLAMMATION IN GILTHEAD SEA BREAM (*Sparus aurata*)

Sustainable development of intensive aquaculture depends on dietary fishmeal (FM) and fish oil (FO) replacement by plant feedstuffs. Though replacement of diet FM poses practical problems most of them are being overcome by the application of judicious nutritional strategies. Replacement of FO by vegetable oils (VO) is more striking, namely by marine fish having absolute requirements of n-3 Long-Chain Polyunsaturated Fatty Acids (LC-PUFA) which are not present in VO. Thus, in practical aquafeeds for marine fish FO cannot be completely replaced by alternative oil sources. FO has however been partially replaced with success in marine fish diets without negative consequences on fish performance. Nevertheless, even partial replacement of FO by VO in aquafeeds drastically alters dietary FA profile and the n-3/n-6 FA ratio, and this may have negative consequences in fish immune status.

This study intends to investigate the effect of dietary FA, and the interaction of dietary FA with dietary carbohydrates, on lipid metabolism, eicosanoid cascade, and the immune status of an important aquaculture species: gilthead seabream (*Sparus aurata*), aiming to potentiate the use of VO in aquafeeds for marine species, aiming to promote a healthy sustainability of aquaculture industry. Data of this study is expected to be extrapolated to other marine fish species, and to contribute for a better understanding of the importance of n-3 FA in farmed animals and humans.

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FRESHCO – MULTIPLE IMPLICATIONS OF INVASIVE SPECIES ON FRESHWATER MUSSEL CO-EXTINCTION PROCESSES

PRINCIPAL INVESTIGATOR AT CIIMAR
Elsa Froufe

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Instituto Politécnico de Bragança

Freshwater ecosystems are one of the most endangered global habitats, with biodiversity declines far greater than those on marine and terrestrial realms. This is especially true for freshwater mussels (FM: Bivalvia: Unionoida) which are responsible for important ecological functions and services and are among the most threatened faunistic groups worldwide. FM depend on fish to complete their life cycle, where mussel larvae (glochidia) use a specific range of fish hosts. This trait makes them particularly threatened by invasive alien species (IAS) since changes on the host fish populations may eventually lead to the decline or coextinction of the dependent species. However, it is extremely difficult to disentangle the real impact of IAS from other disturbing factors such as habitat loss and fragmentation, pollution, climate change and overexploitation. The Iberian Peninsula holds a high level of spatially restricted species and endemism as well as a large number of threatened freshwater species, including fish and mussels. Furthermore, Iberian freshwater systems have suffered a long history of habitat degradation being also among the most heavily invaded ecosystems in the world. These facts turn the Iberian Peninsula in an excellent case study to assess the impacts of IAS on local threatened freshwater fauna. Under those considerations, the present proposal aims to estimate the direct and indirect impacts of selected highly IAS belonging to distinct functional groups (from plants to vertebrates) on the native Iberian FM and its fish host fauna. Our approach is novel and will use a combination of classical ecological approaches as well as cutting edge environmental isotope analysis, modelling and molecular techniques.

JELLYFISHERIES – TOWARDS AN INTEGRATED APPROACH TO ENHANCE PREDICTIVE ACCURACY OF JELLYFISH IMPACT ON COASTAL MARINE ECOSYSTEMS

Climate change and overfishing promote marine ecosystem instability, thereby fostering low-economic value species with rapid- turnover, such as jellyfish (i.e. cnidarian medusae and ctenophores). Ubiquitous in marine food webs, frequent proliferations of jellyfish are acknowledged as indicators of marine ecosystem change. Increased jellyfish outbursts concomitant with global anthropogenic changes are of current concern due to their harmful impact on fish stock and tourist industry.

JELLYFISHERIES aims to unveil the underlying mechanisms through which global antropogenic changes interact with jellyfish populations in Portuguese coastal ecosystems, namely by: (1) providing an overview of the current state of jellyfish, both native and invasive species; (2) quantifying the effects of jellyfish blooms on the ecosystem; (3) assessing jellyfish blooms expansion; (4) evaluating consequences of jellyfish blooms for tourism, industry and fisheries, and (5) contributing and develop synergies with similar scientific programs dealing with ecosystem responses to Global Change.

Ultimately, this project will suit Portugal with a coastal alert system for the occurrence of marine threats (e.g. jellyfish blooms), evaluating marine productivity and predicting ecosystems responses, as well as the recruitment of commercially important fish stocks (e.g. sardine).

JELLYFISHERIES consists of a multidisciplinary team with researchers from different Portuguese institutions – IPLeiria, IPMA, CIIMAR and CCMAR, complemented with two international partners, from the Gothenburg University (Sweden) and the GEOMAR (Germany).

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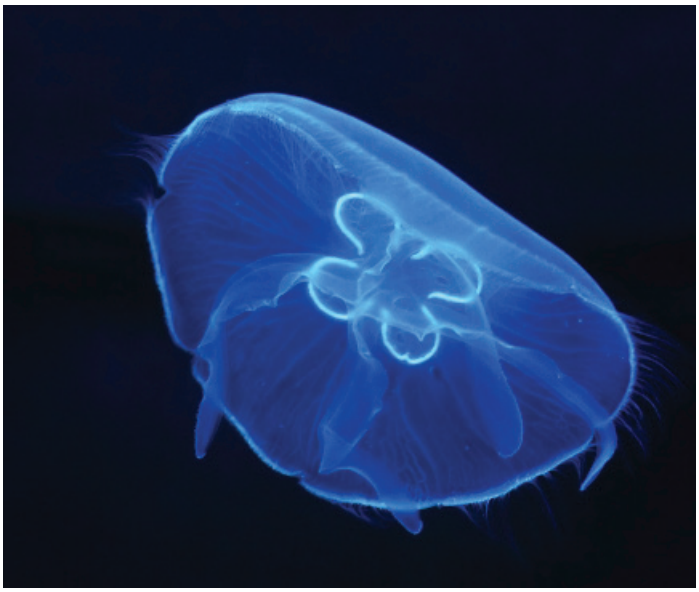

PLASTICGLOBAL – ASSESSMENT OF PLASTIC: MEDIATED CHEMICALS TRANSFER AND EFFECTS IN FOOD WEBS OF DEEP, COASTAL AND ESTUARINE ECOSYSTEMS UNDER GLOBAL CHANGE SCENARIOS

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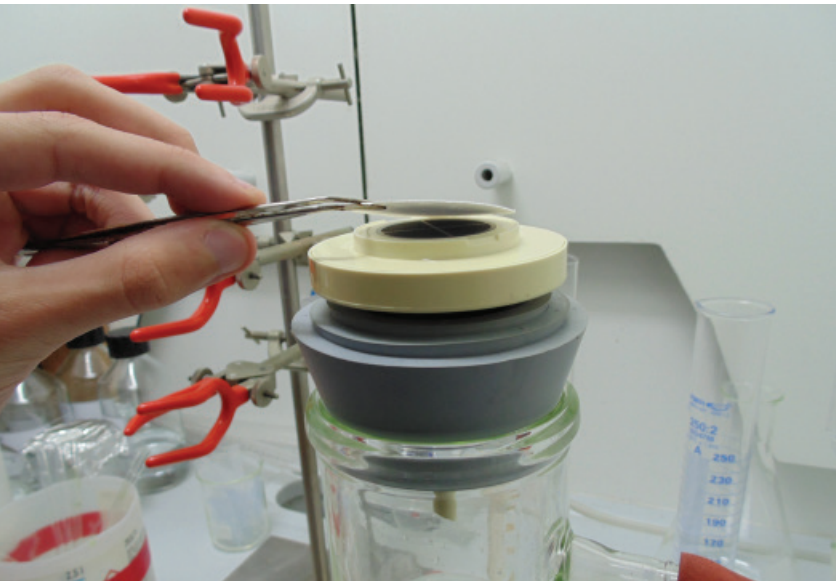
The marine environment contamination by debris of several types is a global scale paradigm of difficult solution. Thus, marine litter is now an international priority topic of research and is included in the European Marine Strategy Framework Directive (MSFD) as a key Descriptor (D) – D10. Plastics are a major component of marine litter. Plastic particles under 5 mm of size, known as microplastics (MP), have been found worldwide and are able to cause physical and chemical adverse effects on wild animal species often leading to death. Thus, a high concern relatively to the adverse effects of these particles and the chemicals that they may contain (MP-chemicals) on environmental and human health exists, especially after their introduction into marine food webs. The MP-mediated chemicals transfer and its effects are poorly documented, further knowledge being urgently needed to assess environmental risks (ERA) and to guarantee the safe consumption of marine species by humans. The main goal of PLASTICGLOBAL is to assess the MP-mediated chemicals transfer in marine food webs and its effects on the biota under climate change scenarios. The first part of the project aims to document the MP (types, size classes,..) and MT-chemicals in the water column, sediment and biota of 3 ecosystem types: deep sea (Madeira Island Region), Continental (Portuguese) waters, and estuary (Minho River, included in Nature 2000) and their biological effects. The second part of the project refers to experimental data in support of models representing the transfer of MP-chemicals to organisms and through food webs, and their effects. Plastic properties (size, type, environmental aging), and trace elements microdistribution on the MP surface will be considered. The effects induced by MP and MP-chemicals (single & multi-stressors exposures) on selected species representative of at least 3 trophic levels (food chain models) of marine/estuarine ecosystems will be studied in relation to climate changes. Finally, a preliminary ERA of temperature rise on the MP-chemicals transfer and its effects will be done and the implications for human food safety will be established.



MYTAG – INTEGRATING NATURAL AND ARTIFICIAL TAGS TO RECONSTRUCT FISH MIGRATIONS AND ONTOGENETIC NICHE SHIFTS

Fish migrations are a fundamental concern in marine biology, still triggering scientific curiosity and technological challenges. Reconstructing migration pathways throughout fishes' life cycle is fundamental to understand population dynamics, fishes' resilience to harvest and ultimately design effective management and conservation plans. Despite multiple efforts in the last decades combining innovative techniques and approaches, studying individual fish movements remains a challenge, and is a new and exciting field of application of technological innovation to marine sciences.

MYTAG will use state of the art techniques to integrate natural and artificial markers to study fish reproductive migrations, estuarine colonization and nursery habitat use of a model species, the European flounder (*Platichthys flesus*). Flounder is a species that migrates along the river-estuary-sea continuum throughout its life-history, with adults migrating offshore to spawn and early life-stages as larvae and juveniles migrating into coastal or estuarine habitats. The innovative aspect of this project is the integration of both natural and artificial tags, and the development and application of new technological solutions for tracking marine fish populations using autonomous surface vehicles (ASVs). The project starts by a preliminary experimental work in the laboratory and in the field to test the effects of acoustic markers and external tags on fish behaviour, condition and survival. A strategically designed field work approach will reconstruct life-history migrations using natural markers, as otoliths and gonads. New technological approaches for direct tracking of fish movements over the river-estuary-sea continuum will be firstly developed on laboratory trials, and later in the final marine tracking experiment. Selected artificial tags will be applied to fish, including external tags for mark-and-recapture experience and acoustic tags to be tracked by ASVs to disclosure the species' major life-history events, as spawning migrations, estuarine nursery colonization and differential habitat use. MYTAG implements a new multi-tag approach and innovative techniques applicable to many species worldwide, improving the efficacy of management and conservation strategies, allowing also for the opportunity of new technological innovation.

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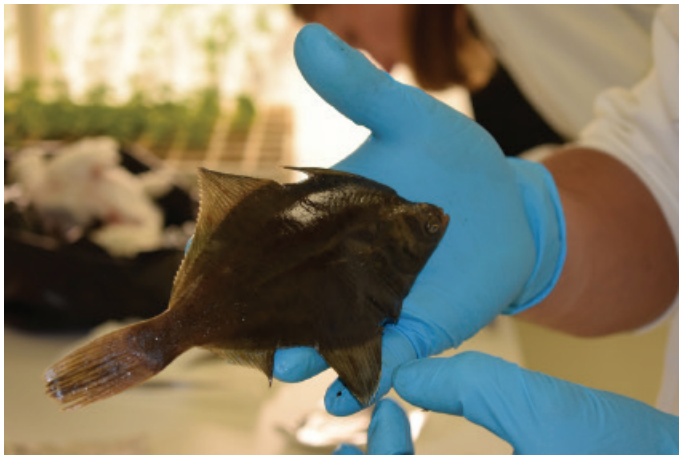
/MytagProject



REEuse - RECOVERY VERSUS ENVIRONMENTAL IMPACTS OF RARE EARTH ELEMENTS DERIVED FROM HUMAN ACTIVITIES

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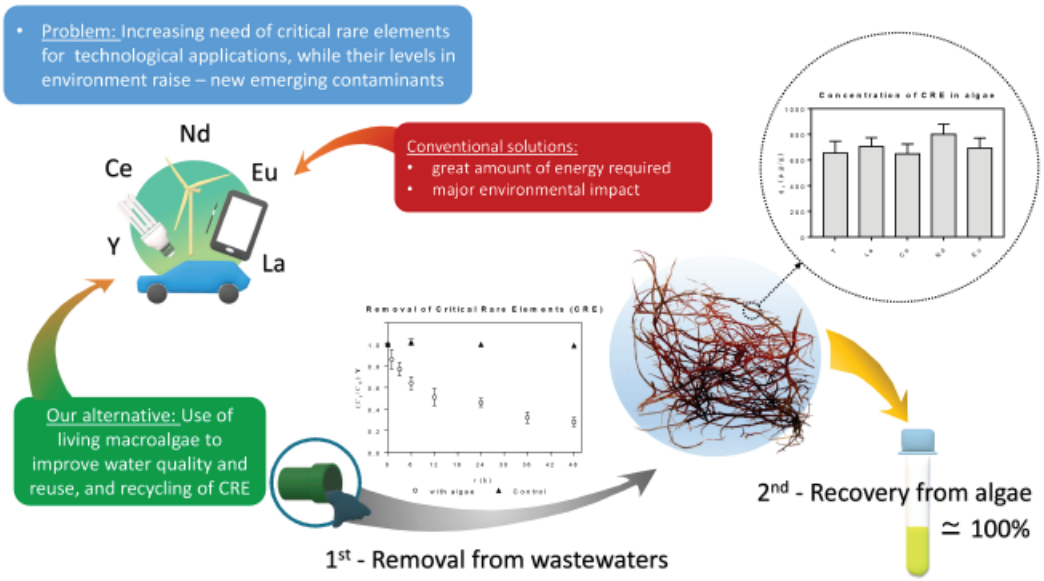
The European Union has classified rare earth elements as Critical Metals because of its low abundance in Nature and the fact that mining is carried out almost exclusively by the People's Republic of China. This may lead to a bottleneck in the world's economy and hamper the implementation of the EU's Energy and Technology Strategic Plan. Rare earth elements have been considered important raw material for industry and are also essential in new technologies in electronics, pharmaceuticals, industrial products and innovative technologies for environmental protection. The duality between the mining monopoly and the increasing application of rare earth elements creates ideal conditions to develop recycling and reuse processes of these elements. However, the massive use of rare earth elements in the industry also leads to their rejection through sewage and waste and are therefore considered as emerging contaminants. Studies of the cycle of these elements in the environment are few and therefore their potential impact on aquatic ecosystems is not known.

In order to address this problem, the objective established for the project is to obtain know-how to improve the recycling process of rare earth elements and, consequently, to reduce the emissions of these elements to the aquatic environment. The project aims to select chemical methodologies or biological processes with conventional or alternative application to remove rare earth elements from urban and industrial sewage. This scientific knowledge will support the recycling and later reuse of these elements in industrial processes. The project will also assess the benefits of reducing emissions of these elements to the environment. The design of this project is also innovative from the environmental point of view because the recycling and reuse process of these contaminants has a positive environmental impact.



CAUSALITIES BETWEEN DIVERSITY, ECOSYSTEM FUNCTIONS AND SERVICES IN MARINE ECOSYSTEMS

Aquatic ecosystems provide essential resources for mankind. However, human activities on these systems have been driving unprecedented biodiversity loss, which may be aggravated by climate. As such, this project aims to apply the Ecosystem-Based Management to estuarine systems subjected to different anthropogenic impacts and climate regimes. We will review the pressures, state and consequent impacts on selected case-studies, by integrating the DPSIR framework with ecosystem services (ES). Then, we will address the causalities involving biodiversity, ecosystem functions and ES and how they affect ecosystem resilience. We will specifically test the role of functional diversity as potential indicator of ES. Trait analyses will focus on a multi-trophic approach, which enhances the possibility of successfully describing and predicting ES. The data collected will also be used to compare with baseline information obtained under the scope of previous projects (e.g. within the application of EU-WFD), to define evolution scenarios regarding socioeconomic development and their consequent impacts. In addition, we will include local ecological knowledge in our study, provided by the stakeholders. This information will be obtained mainly through engaging workshops, where we will gather the perceptions of the stakeholders on the activities, pressures and impacts in their local estuarine area, and listen to their recommendations and perspectives for management. This way, we expect to obtain supporting data to propose recommendations for an integrated management, legitimized by the population, which allows enhancing human well-being without compromising the environment and contributes for current biodiversity protection policies.

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ROSM – ROBOTIC OIL SPILL MITIGATION

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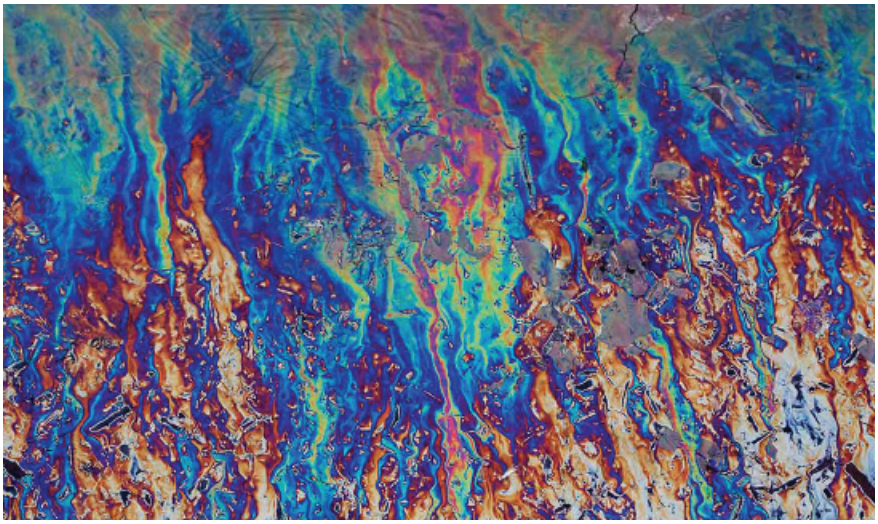
Oil spills are catastrophic events for the marine ecosystems. Due to increasing number of gas and oil off-shore explorations, the risk of having oil spills increased dramatically in the last years. The ROSM addresses the research and development of technology that allows to detect and mitigate oil spills in marine environment. The ROSM project envisions to advance the state-of-the-art in two distinct scientific areas:

i) Development of a new biotechnological tool that takes advantage of the highly effectiveness of native microbial consortia to bioremediate oil spills. This procedure will potentiate microbial survival and bioremediation efficiency in the affected areas, while avoiding environmental risks derived from the introduction of non-native organisms. In addition, we intend to develop a library of native microbial consortia for bioremediation, the optimization of production of selected cooperative consortia, and cocktails of nutrients to stimulate the consortia activity.

ii) For this biotechnology to be effective, one must use vehicles (carriers) that can transport the native microbial consortia, but at the same time be able to operate in hazard remote areas in an autonomous and effective manner. To do so in ROSM, Unmanned Aerial Vehicles and Unmanned Surface Vehicles will be developed and used to carry and release the bioremediation agents. The autonomous systems will be able to autonomously detect and navigate through the oil spills based on their sensing mechanisms. An autonomous surface vehicle will be used for operating in oil spill costal areas. ROSM will develop perception methodologies and algorithms that allows the surface vehicle to act as a home-relay for VTOL take-off and landing. The autonomous vehicles will use their pose and attitude sensors to geo-reference and mark the oil spills areas to the safety operators, releasing the capsules with cm accurate positioning.

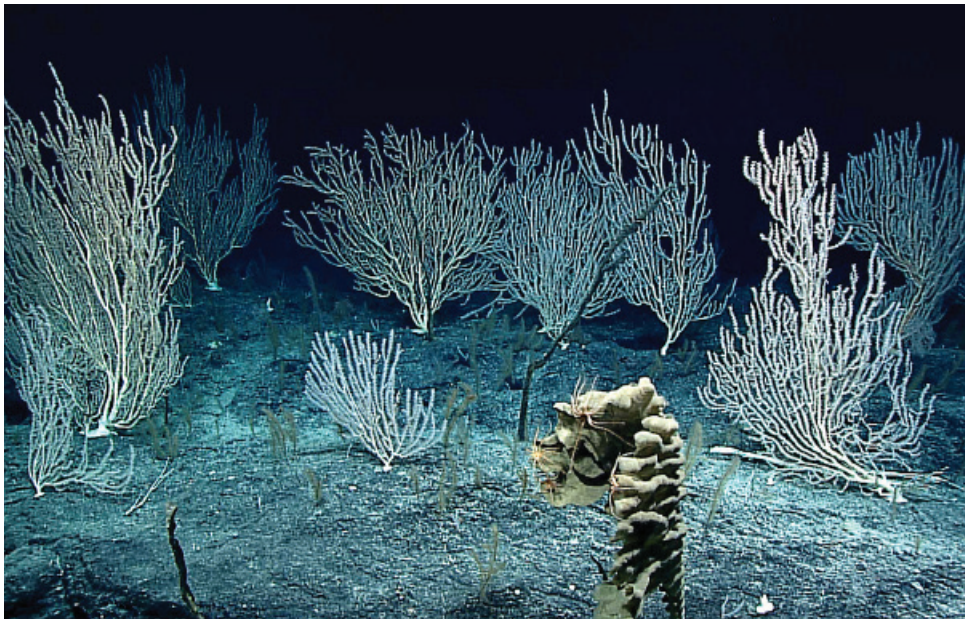


EMSO-PT – EUROPEAN MULTIDISCIPLINARY SEA FLOOR AND WATER COLUMN OBSERVATORY – PORTUGAL

The deep-sea floor ecosystem, one of the largest on the planet, is poorly monitored. Challenges related to direct or indirect anthropogenic actions can only be dealt with if long lasting seafloor and water column observatories networks are deployed. EMSO is a large-scale European Research Infrastructure, of which Portugal is one of its five funding members, established with the objective of real-time, long-term monitoring of environmental processes related to the interaction between the geosphere, biosphere, and hydrosphere. It is a geographically distributed infrastructure at key sites in European waters.

EMSO-PT objectives are to create long term, sustainable, deep sea marine observatories integrated in the European EMSO-ERIC and in cooperation with other international similar networks. These aim at promoting long term time series of sea-floor and water column of various abiotic and biotic parameters in order to serve the international community of scientists, students, general society and stakeholders. EMSO identifies eight main scientific questions: 1) Dynamics of tectonic plates; 2) Climate and greenhouse gas cycling; 3) Ocean productivity; 4) Marine mammal and fish stocks; 5) Non-renewable marine resources; 6) Episodes, events and catastrophes; 7) Origins and limits of life; 8) marine ecosystems dynamics. All these topics are dependent on long-term, continuous, observations, able to capture data for significant episodes as they occur.

The ultimate goal of EMSO-PT is to organize the Portuguese contribution to the EMSO network. In the mainland, two sites will be considered, one deep (Cadiz) and another shallow (North Portugal). The site to be developed in North Portugal will be a test bench for emerging monitoring strategies, towards implementing sustainable monitoring operations and setting the basis for the development of new marine products and services.



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EMBRC-PT - EUROPEAN MARINE BIOLOGICAL RESOURCE CENTRE - PORTUGAL

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EMBRC.PT is a distributed research infrastructure with nodes in Faro, Horta, Coimbra and Porto/Matosinhos where CIIMAR headquarters are located. It will allow researchers to study marine biodiversity in its habitat, in tanks and in the laboratory with the latest technologies. It is the national node of the European Marine Biological Resource Centre (EMBRC) and it is expected that the foreseen increased scientific activity will potentiate development of technologies and products with a positive impact in the regional and national economies.

CIIMAR via EMBRC.PT provides services in marine sciences: access to marine ecosystems and biodiversity, microorganism collections and model organisms, scientific diving, "omics", bioinformatics and chemistry platforms. It will also offer access to a variety of aquaria facilities, general laboratories, and marine observatories for long term observations. The present project was designed to significantly improve the EMBRC.PT infrastructure and human resources so as to meet the excellence requirements of the European infrastructure and to remote research, training and knowledge transfer, so as to impact positively in the regional and national economy.

BBMBC – A BLUE BIOTECHNOLOGY MASTER FOR A BLUE CAREER

BBMBC will create a completely new teaching programme focused on blue biotechnologies and dedicated to their application particularly in the health, nutrition and aquaculture domains. Indeed, the cutting-edge sector of marine biotechnology lacks high-skilled scientists with both academic and practical knowledge. Therefore, this unique public-private partnership involving academic organisations and Small and Medium Sized Enterprises (SMEs) from France, Portugal, Spain and the United Kingdom, along with specific structures such as the CPMR Atlantic Arc Commission, will set up Master's degree level in this pivotal field to sustainable global development.

The Master's curriculum will be dedicated to graduate students and workers allowing them to gain expertise in the blue biotechnology field in 10 months. Thematic courses will be scheduled intensively on a weekly basis. As well as educational courses, work-linked training will take place during the course on industrially-relevant problems, combining practical approaches to the latest scientific knowledge and research. Moreover, from the beginning of this master's programme, each student will be associated with a project led by a blue biotechnology industrial partner and will be hosted in this structure for the duration of the apprenticeship or internship.

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BIP – BUSINESS IGNITION PROGRAMME

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bip.up.pt

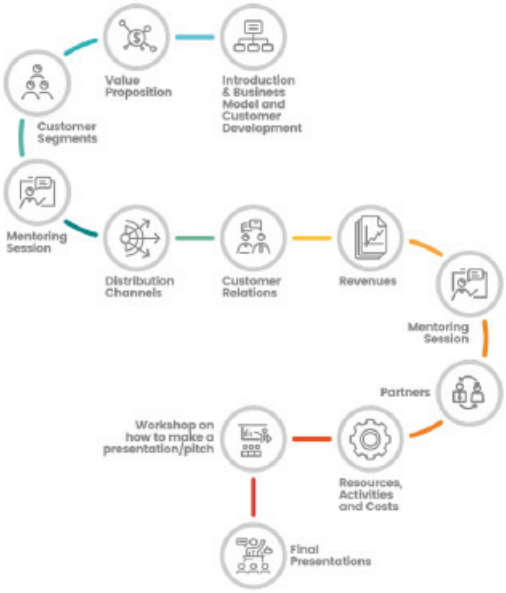
The BIP – Business Ignition Programme is a hands-on technology acceleration programme designed to support the validation of business models for technologies developed in academia. The programme has three main objectives:

- Identify market opportunities for potential products/services resulting from research;
- Provide the participants with the necessary skills for the valorisation and commercialisation of technologies;
- Support the development of valorisation plans, including the creation of new technology-based companies.

BIP participants will have access to:

- Support and follow-up by one element, with business skills, who will apply their skills, experience and networking to the development of the project, as a member of the team.
- Immersive sessions in technology commercialisation according to the Business Model Canvas and Customer Development methodologies.
- In-class sessions and seminars where experienced tutors will share their experiences and strategies for delineating and validating business models.
- Meetings with mentors who will follow the evolution of teams and facilitate the validation of business models.

During the programme, Customer Development process, developed by Steve Blank, and the Business Model Canvas methodology, created by Alexander Osterwalder, will be applied to help the teams approach the market and find product/market fit. Sonae will be BIP's business partner providing mentorship to ideas and projects with application in the retail sector.



MARLITALEDOT- MARINE LITTER AWARENESS THROUGH LEARNING BY DOING TOGETHER

Since Educational systems must change to face present XXI century challenges, teachers and students ought to acquire key competences like learning through experience, spotting opportunities and skills for teamwork and public speaking while working with community organisations and networking. MARLITALEDOT will promote those competences/skills using marine litter as shared topic within our oceans trash free.

This project has three main objectives:

- First is to enhance integration between four educational centers and four local civil association networks towards enhancing intercultural competences on marine science and community participatory outreach.
- Second, to reinforce teacher role and professional development while providing an opportunity to design open educational materials linking outdoor community actions and acquisition of skills and competences from a holistic approach. Through this objetive innovation on a digital era and practical science skills will be build in four countries in different environmental and cultural contexts having marine conservation practices as a common ground to be included on the official curriculum.
- Third, to introduce a systemic approach to reinforce European educational dissemination practices by increasing synergies amongst national and international networks and developing effective and innovative challenge based learning through the use of ICT studying real life cases and outdoor community actions around marine litter and trash free seas.

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OCEANLAB – PROTEGENDO OS OCEANOS. VEM AO LABORATÓRIO FAZER CONNOSCO!

PRINCIPAL INVESTIGATOR AT CIIMAR
Laura Guimarães and Marisa Almeida

LEADER INSTITUTION
CIIMAR-UP

Ocean protection is a global priority and crucial for Portugal, a country with extensive coast and notable Exclusive Economic Zone. This protection can only be achieved by increasing knowledge and integrated discussion on the great interaction existing between the ocean and humans, as well as on initiatives such as the Marine Strategy Framework Directive and its descriptors of Good Environmental Status (GES).

OceanLab proposes the creation of a specific experimental laboratory (the OceanLab) to receive young people, their teachers and family members at CIIMAR, leading them in a holistic approach to increase their Ocean Literacy. The program is dedicated to perform hands-on scientific experiments, putting young people into practice, in a laboratory context. Experiments are related to integrated management of the marine environment and maintenance of GES. OceanLab also organises science in the holidays weeks and open science events to the general public. OceanLab is supported by the "CIIMAR na Escola" programme and its associated Science Blog.

OCEAN ACTION – MAR DE PLÁSTICO

More than 8 million tons of plastic reach annually the ocean, causing very significant negative impacts on marine life, economic activities and human health. Ocean Action Campaign developed different communication tools to raise awareness of school community and general public about the problem of plastic marine debris.

The traveling exhibition "Plastic Sea", with a combination of art objects, sensory areas, multimedia and roll-up graphic panels, was exhibited so far in 12 localities. The "Marine Monsters" exhibition spread three large sculptures constructed with discarded plastics throughout different public noble spaces of Porto and neighbor cities, depicting different consequences of plastic debris on marine ecosystems. An original theatre piece "Pearl in Plastic Sea" was developed to raise awareness about marine litter and its consequences by recreating the story of the little mermaid in an adventure fraught with danger due to the ever increasing garbage that reaches the sea.

Plastic Sea project also included more conventional hands-on science activities and lectures in schools, beach cleaning activities and the production of educational videos. The combination of different communication methods aimed to encourage the critical reflection about this environmental problem of great importance and scientific complexity and the need to adopt environmentally responsible behavior by the population through the use of complementary, artistic and innovative approaches. This Campaign was awarded in 2016 with the Green Project Award for the best Mobilization Initiative.

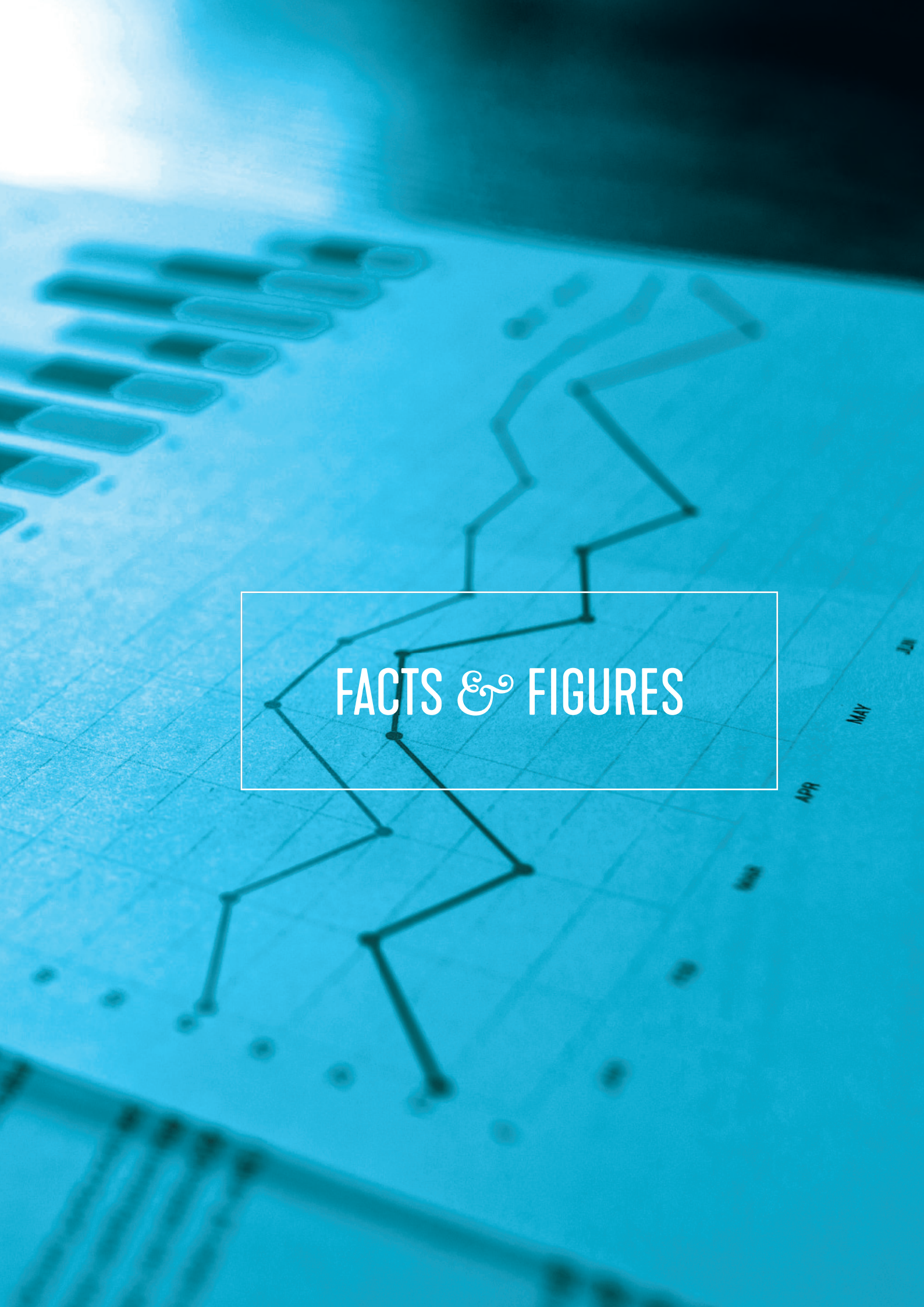
PRINCIPAL INVESTIGATOR AT CIIMAR
José Teixeira

LEADER INSTITUTION
CIIMAR-UP

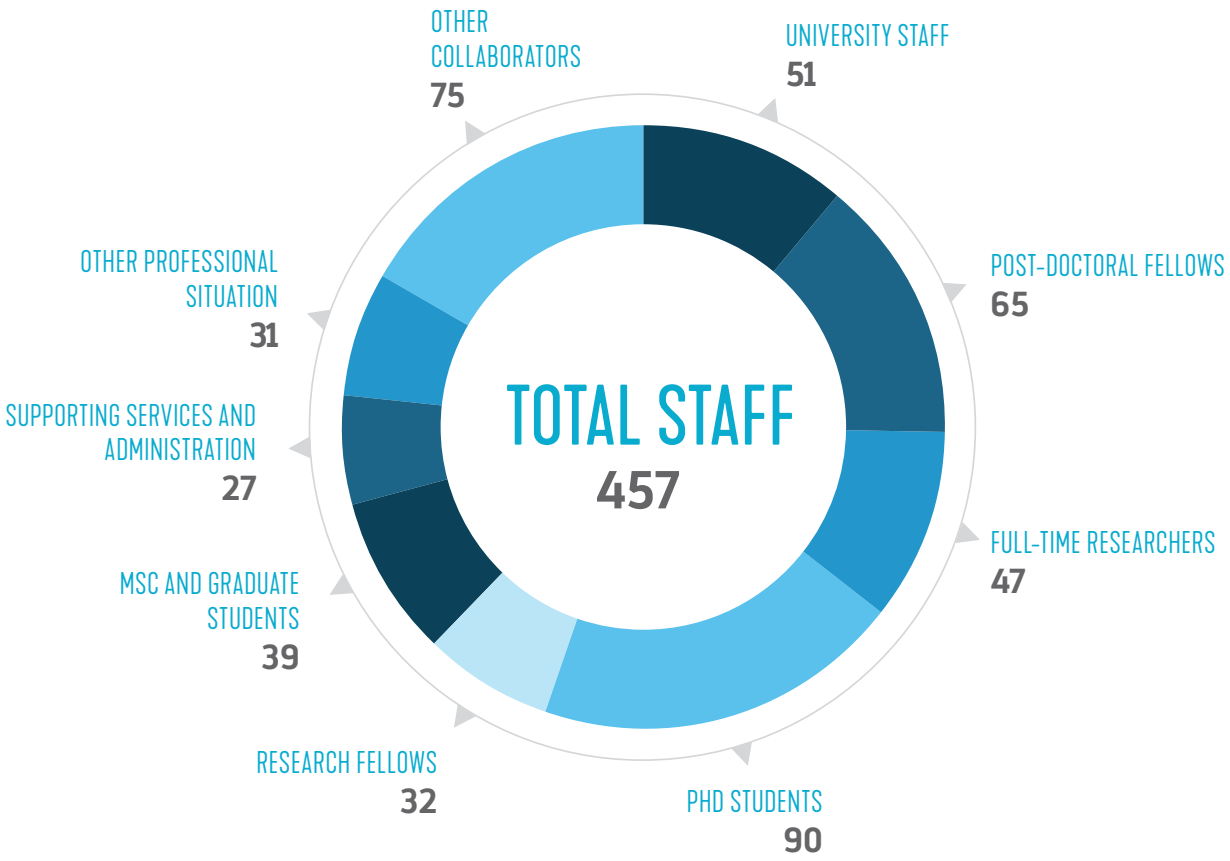
WEBSITE
http://oceanaction.pt

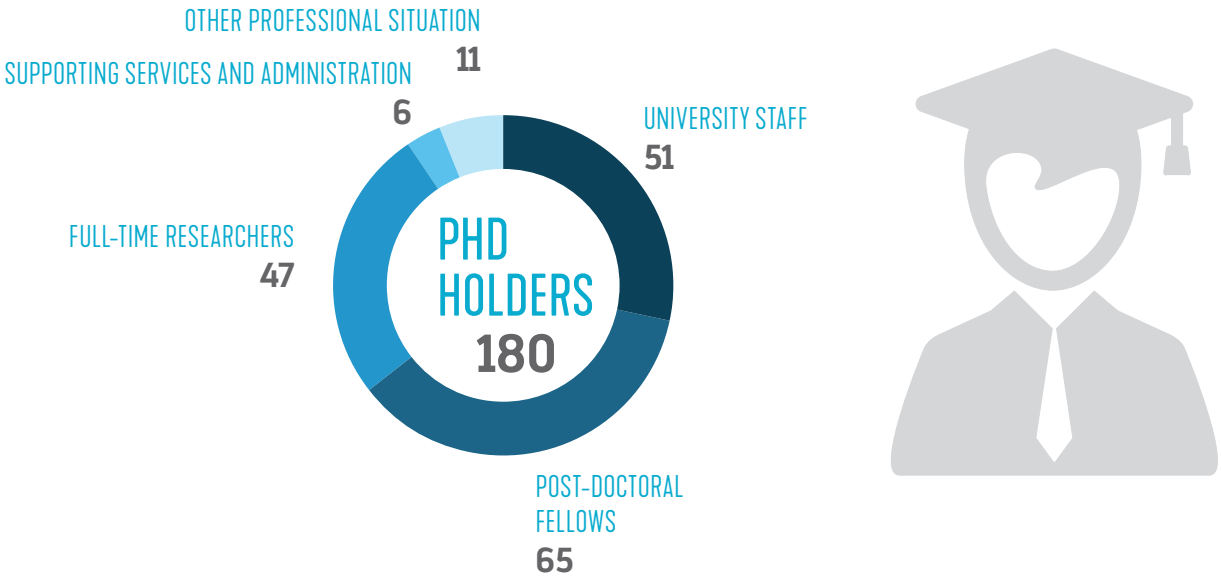
FACEBOOK
/OceanActionPortugal


JAN
FEB

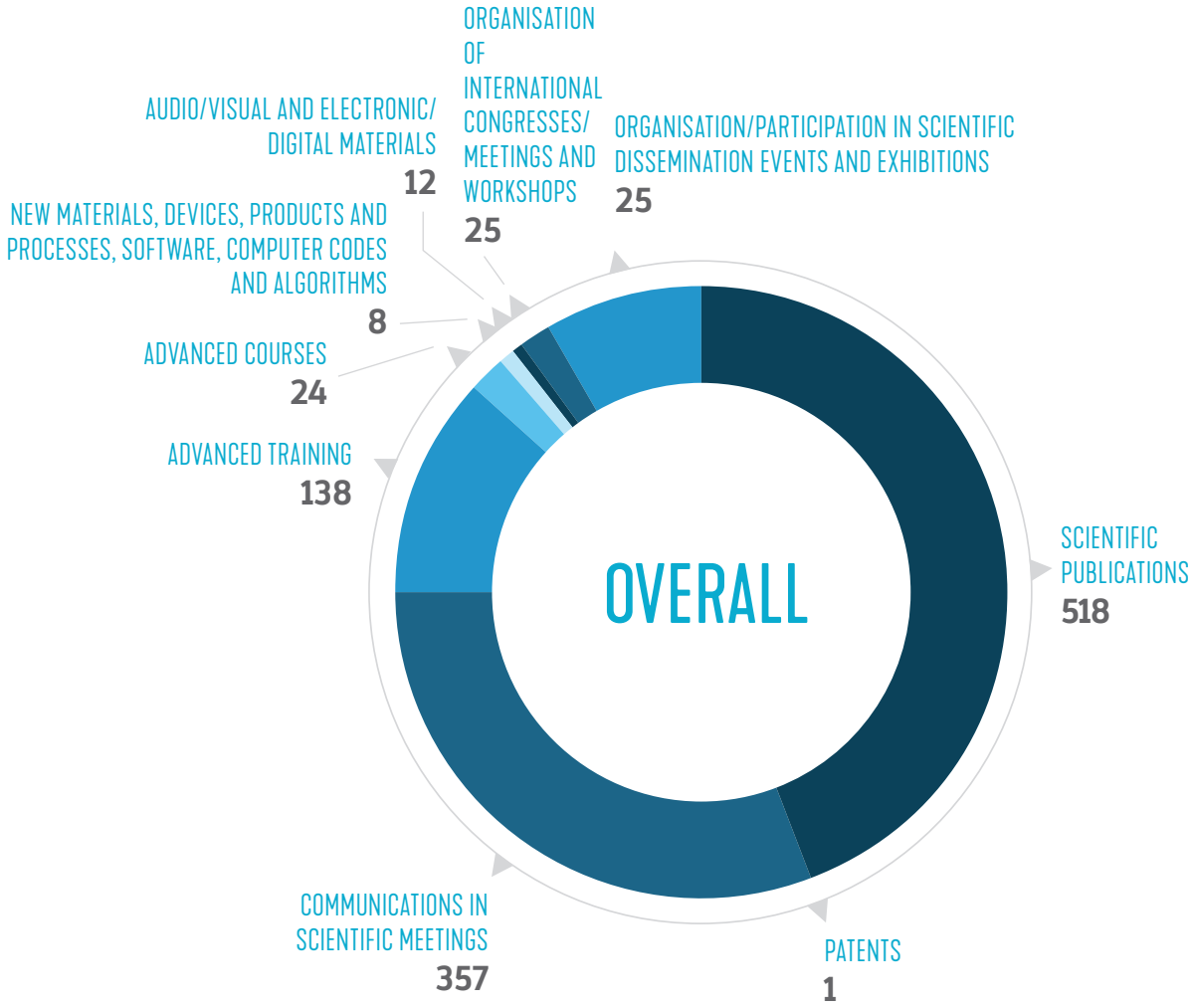

FACTS & FIGURES

TEAM

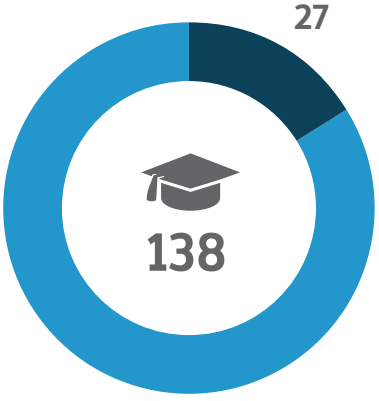

TOTAL STAFF
457
OTHER COLLABORATORS
75
UNIVERSITY STAFF
51
POST-DOCTORAL FELLOWS
65
FULL-TIME RESEARCHERS
47
PHD STUDENTS
90
RESEARCH FELLOWS
32
MSC AND GRADUATE STUDENTS
39
SUPPORTING SERVICES AND ADMINISTRATION
27
OTHER PROFESSIONAL SITUATION
31

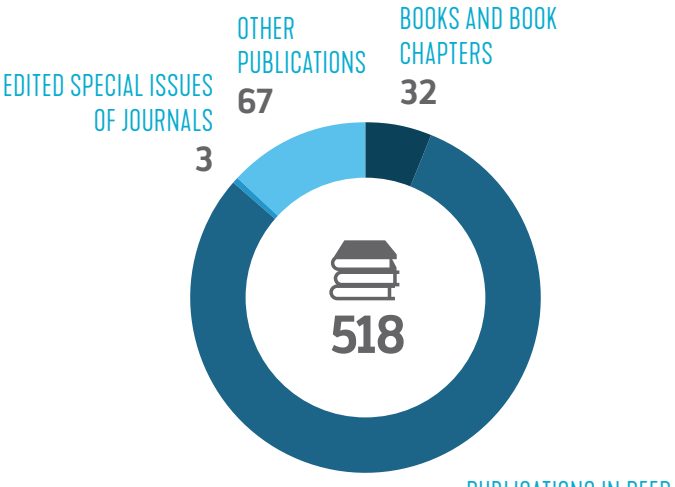

PHD HOLDERS
180
UNIVERSITY STAFF
51
POST-DOCTORAL FELLOWS
65
FULL-TIME RESEARCHERS
47
SUPPORTING SERVICES AND ADMINISTRATION
6
OTHER PROFESSIONAL SITUATION
11

SCIENTIFIC PRODUCTIVITY



ADVANCED TRAINING

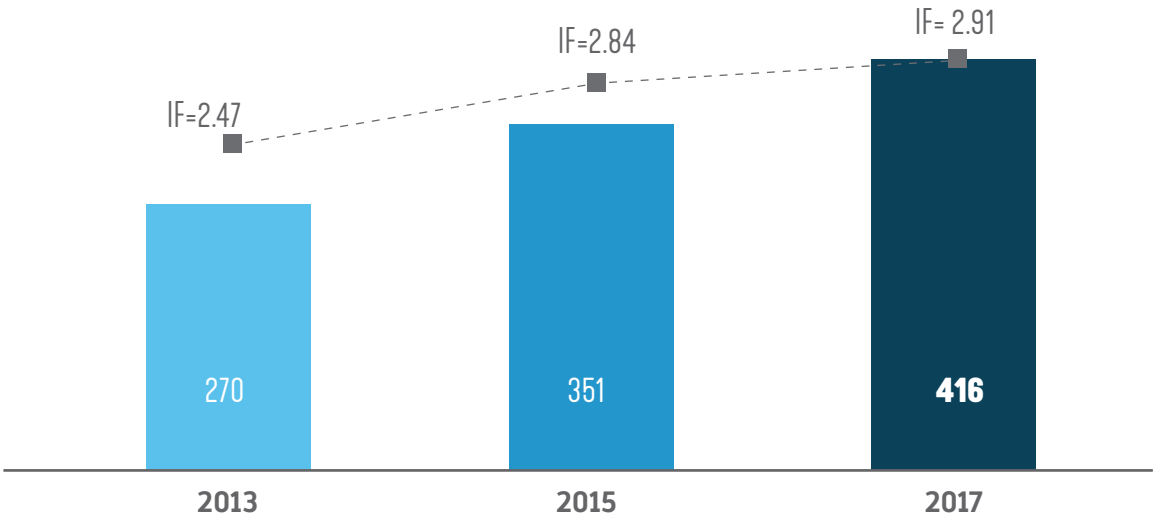




SCIENTIFIC PUBLICATIONS

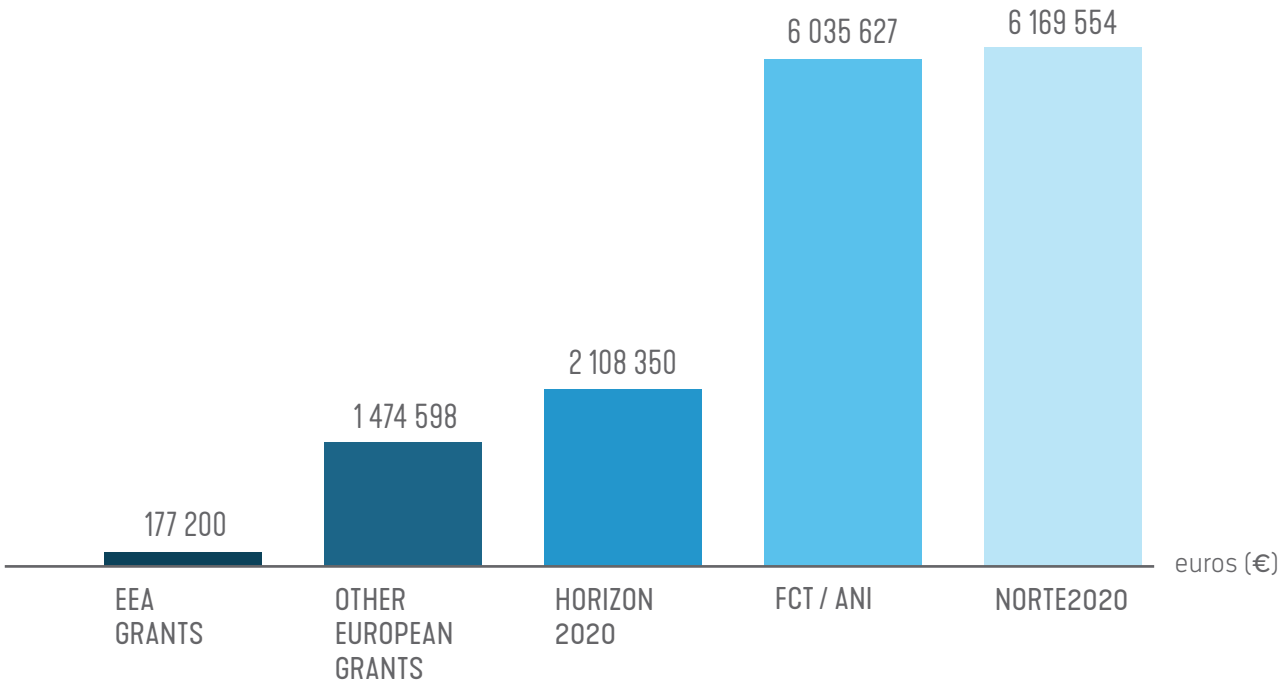
NR OF PUBLICATIONS IN PEER REVIEWED JOURNALS [2013-2017]

IF = Mean impact factor



COMPETITIVE R&D PROJECT FUNDING

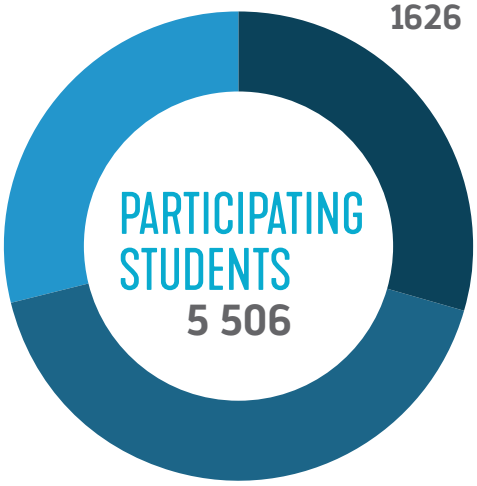
Total competitive funding attributed to CIIMAR in R&D projects in execution during 2017



OUTREACH ACTIVITIES

NUMBER OF STUDENTS THAT VISITED CIIMAR
1626

NUMBER OF STUDENTS THAT CARRIED OUT PRACTICAL ACTIVITIES
1590

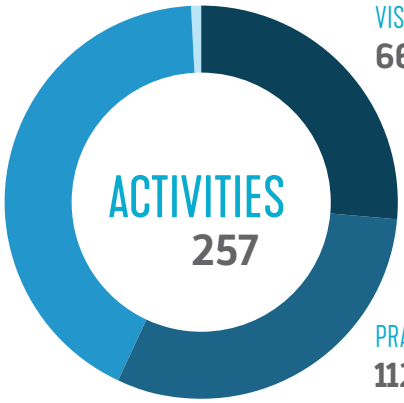


NUMBER OF STUDENTS THAT ATTENDED CIIMAR LECTURES
2290

EXHIBITIONS
2

VISITS TO CIIMAR
66

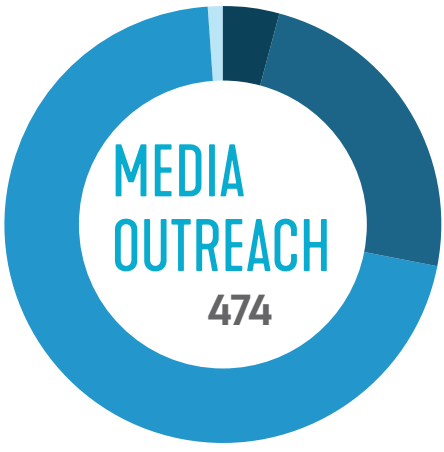
LECTURES
77



PRACTICAL ACTIVITIES
112

RADIO
4

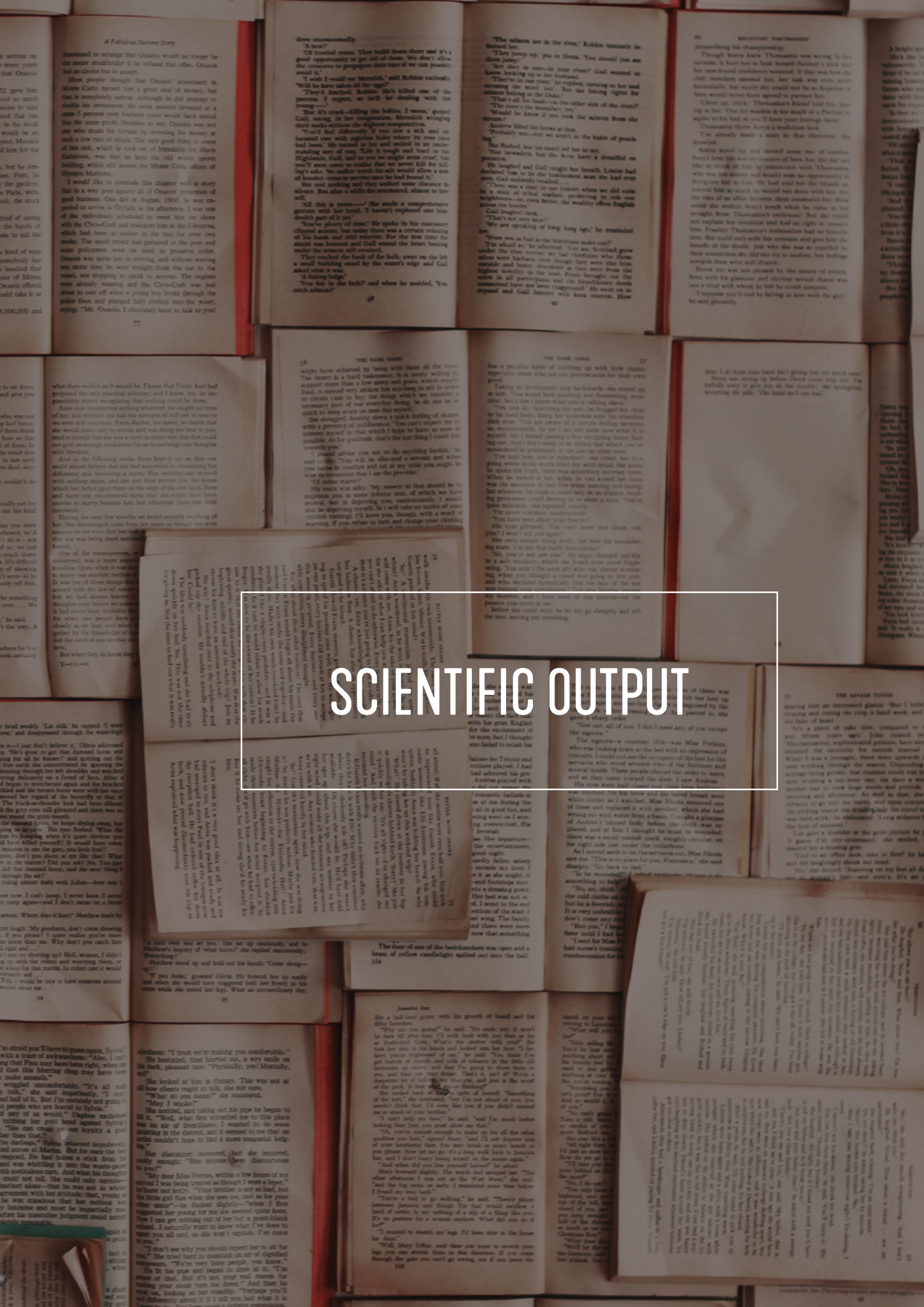
TELEVISION
21



NEWSPAPERS
113

WEB NEWS
336

• Total number of published news in 2016 - 358



SCIENTIFIC OUTPUT

SCIENTIFIC OUTPUT

PUBLICATIONS

Books and book chapters of international circulation	32
Publications in peer reviewed journals	416
Edited special issues of journals	3
Other publications	67

COMMUNICATIONS IN INTERNATIONAL SCIENTIFIC MEETINGS 357

ADVANCED TRAINING

Completed PhD theses under the supervision of integrated members	27
Completed Master theses under the supervision of integrated members	111
Training courses	24

OTHER SCIENTIFC OUTPUTS

Patents	1
New Materials, Devices, Products and Processes, Software, Computer Codes and Algorithms	8
Audio/Visual And Electronic/Digital Materials	6
Organisation Of International Congresses/Meetings And Workshops	20
Organisation/Participation In Scientific Dissemination Events And Exhibitions	96

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ADVANCED TRAINING

Completed PhD theses

Name: Adriana Araújo Novais
Thesis title: Invasive species as resource subsidies: Functional importance
Doctoral Programme/Doctoral Degree: Molecular and Environmental Biology
Faculty/University: University of Minho
Supervisor: Ronaldo Sousa
Co-Supervisor: Cláudia Pascoal
Date: April 2017

Name: Ágata Sofia da Silva Vieira
Thesis title: Reabilitação cardiovascular na fase de manutenção em contexto domiciliário, com recurso à realidade virtual
Doctoral Programme/Doctoral Degree: Biomedical Sciences
Faculty/University: ICBAS, University of Porto
Supervisor: Jorge Pereira Machado
Date: November 2017

Name: Ana Margarida da Gama Pereira Antunes de Carvalho
Thesis title: Study of shanny (*Lipophrys pholis*) life cycle inferred from microstructure and microchemistry of otoliths: ontogeny, coastal recruitment and connectivity
Doctoral Programme/Doctoral Degree: Biology
Faculty/University: FCUP, University of Porto
Supervisor: Alberto Teodorico Correia
Co-Supervisor: Paulo José Talhadas dos Santos
Date: June 2017

Name: Ana Maria Ferreira Capitão
Thesis title: Screening obesogens in aquatic model organisms
Doctoral Programme/Doctoral Degree: Biology
Faculty/University: FCUP, University of Porto
Supervisor: Miguel Santos
Co-Supervisor: Luís Filipe Castro
Date: December 2017

Name: Bárbara Bilreiro de Mendóça Frazão e Teixeira
Thesis title: A genomic and proteomic study of sea anemones and jellyfish from Portugal
Doctoral Programme/Doctoral Degree: Biology
Faculty/University: FCUP, University of Porto
Supervisor: Vitor Vasconcelos
Co-Supervisor: Agostinho Antunes
Date: January 2017

Name: Cátia Alexandra Ribeiro Venâncio
Thesis title: Salinization effects on coastal terrestrial and freshwater ecosystems.
Doctoral Programme/Doctoral Degree: Biology
Faculty/University: FCUP, University of Aveiro
Supervisor: Isabel Antunes Lopes
Co-Supervisor: Ruth Pereira
Date: December 2017

Name: Daniel de Jesus Crespo
Thesis title: Interactive effects of global ecological changes in the ecosystem functioning of estuarine systems: invasive species and climate change
Doctoral Programme/Doctoral Degree: Biology
Faculty/University: University of Coimbra
Supervisor: Miguel Pardal
Co-Supervisor: Marina Dolbeth
Date: May 2017

Name: Daniela Martins Almeida
Thesis title: Evolutionary genomics of genes involved in the environmental adaptation of metazoans
Doctoral Programme/Doctoral Degree: Biology
Faculty/University: FCUP, University of Porto
Supervisor: Agostinho Antunes
Co-Supervisor: Vitor Vasconcelos
Date: June 2017

Name: Dany Dominguez Pérez
Thesis title: Proteomics and transcriptomics of venomous animals
Doctoral Programme/Doctoral Degree: Biology
Faculty/University: FCUP, University of Porto
Supervisor: Agostinho Antunes
Co-Supervisor: Vitor Vasconcelos
Date: July 2017

Name: Eko Yuli Handoko
Thesis title: Sea level studies in Indonesia from improved coastal satellite altimetry
Doctoral Programme/Doctoral Degree: PhD in Surveying Engineering
Faculty/University: FCUP, University of Porto
Supervisor: Joana Fernandes
Co-Supervisor: Clara Lázaro
Date: October 2017

Name: Filipe Fernandes Coutinho
Thesis title: otential benefits of functional amino acids in fish nutrition
Doctoral Programme/Doctoral Degree: Biology
Faculty/University: FCUP, University of Porto
Supervisor: Aires Oliva-Teles
Co-Supervisor: Helena Peres
Date: July 2017

Name: Helena Melo Amaro
Thesis title: Research and characterization of bioactive compounds with potential Pharmaceutical Application Produced by Microalgae and Cyanobacteria
Doctoral Programme/Doctoral Degree: Biomedical Sciences
Faculty/University: ICBAS, University of Porto
Supervisor: Franciso Xavier Malcata
Co-Supervisor(s): Isabel Sousa Pinto and Eduardo Rocha
Date: February 2017

Name: João Nuno Franco
Thesis title: Kelps across Iberia: from patterns of abundance and distribution to top-down and bottom-up regulatory processes
Doctoral Programme/Doctoral Degree: Biology
Faculty/University: FCUP, University of Porto
Supervisor: Iacopo Bertocci
Co-Supervisor: Isabel Sousa Pinto
Date: July 2017

Name: Juliana Marina Moreira Mendes
Thesis title: Previsão e alerta de cheias em bacias regularizadas - Aplicação ao caso de uma bacia portuguesa
Doctoral Programme/Doctoral Degree: Civil Engineering
Faculty/University: FEUP, University of Porto
Supervisor: Rodrigo Maia
Date: May 2017

Name: Lia Bárbara Cunha Barata Duarte
Thesis title: Improvement of GIS risk models based on the development of open source applications
Doctoral Programme/Doctoral Degree: PhD in Surveying Engineering
Faculty/University: FCUP, University of Porto
Supervisor: Ana Cláudia Teodoro
Co-Supervisor: José Alberto Gonçalves
Date: May 2017

Name: Maria Rita Motta de Sottomayor Azeredo Leme
Thesis title: Amino acids as novel nutraceutics to modulate immune mechanisms and increase disease resistance in fish
Doctoral Programme/Doctoral Degree: Biology
Faculty/University: FCUP, University of Porto
Supervisor: Aires Oliva-Teles
Co-Supervisor(s): Benjamín Costas and Lluis Tort
Date: 2017

Name: Mónica Sofia Lopes Marques
Thesis title: The evolution of fatty acid metabolism in Chordates
Doctoral Programme/Doctoral Degree: Biomedical Sciences
Faculty/University: ICBAS, University of Porto
Supervisor: Luís Filipe Castro.
Co-Supervisor(s): Miguel Santos and Eduardo Rocha
Date: September 2017

Name: Odete Marinho Gonçalves Ferreira
Thesis title: The origin of stomach vertebrate and the paradox of loss
Doctoral Programme/Doctoral Degree: Biomedical Sciences
Faculty/University: ICBAS, University of Porto
Supervisor: Jonathan Wilson
Co-Supervisor: Luís Filipe Castro and João Coimbra
Date: February 2017

Name: Patrícia Manuela Areias da Silva
Thesis title: The spindle assembly checkpoin: new insights into its function, regulation and therapeutic implications
Doctoral Programme/Doctoral Degree: Biomedical Sciences
Faculty/University: University of Algarve
Supervisor: Hassan Bousbaa
Co-Supervisor: Álvaro Tavares
Date: September 2017

Name: Paula Alexandra Morgado Cana
Thesis title: Improving growth potential in Senegalese sole (*Solea senegalensis*) through dietary protein: an integrated approach using cellularity, tracer studies and gene expression
Doctoral Programme/Doctoral Degree: Animal Science
Faculty/University: FCUP, University of Porto
Supervisor: Luísa Valente
Co-Supervisor: Sofia Engrola
Date: June 2017

Name: Raquel Andreia Pinheiro Vieira
Thesis title: Variability of harmful seaweeds and invasive species across seashores of North Portugal: from patterns to mechanisms
Doctoral Programme/Doctoral Degree: Biology
Faculty/University: FCUP, University of Porto
Supervisor: Isabel Sousa Pinto
Co-Supervisor: Fancisco Arenas Parra
Date: June 2017

Name: Rui Carlos Pinto Borges
Thesis title: The evolution of the sensorial receptors in vertebrates: focus on vision
Doctoral Programme/Doctoral Degree: Biology
Faculty/University: FCUP, University of Porto
Supervisor: Agostinho Antunes
Co-Supervisor: Vitor Vasconcelos
Date: June 2017

Name: Salman Malakpourkolbadinezhad
Thesis title: Osmoregulation in the striped catfish *Plotosus lineatus*
Doctoral Programme/Doctoral Degree: Animal Science
Faculty/University: FCUP, University of Porto
Supervisor: Jonathan Wilson
Date: December 2017

Name: Sofia Raquel Soares Mesquita
Thesis title: Toxicity of the organic fraction of atmospheric particulate matter
Doctoral Programme/Doctoral Degree: Biology
Faculty/University: FCUP, University of Porto
Supervisor: Laura Guimarães
Co-Supervisor: Natividade Vieira
Date: January 2017

Name: Souheil Ben Mohamed
Thesis title: Amines biogènes et leurs bactéries productrices dans la sardine (*Sardina pilchardus*) et l'anchois (*Engraulis encrasicolus*) salés
Doctoral Programme/Doctoral Degree: Sciences Biologiques
Faculty/University: Biotechnologie de Institut Superieur de Biotechnologie de Monastir, Ecole Doctorale Sciences Biologiques Biotechnologie et Sante
Co-Supervisor: Rogério Mendes
Date: May 2017

Name: Vítor Manuel Capela Ramos
Thesis title: Environmental and applied aspects of cyanobacteria diversity and the importance of its preservation
Doctoral Programme/Doctoral Degree: Environmental Sciences and Technology
Faculty/University: FCUP, University of Porto
Supervisor: Vitor Vasconcelos
Date: February 2017

Name: Wenlin Yan
Thesis title: Development of an Algorithm for a GNSS/MEMS-IMU/Imaging Coupled System for Direct Georeferencing
Doctoral Programme/Doctoral Degree: PhD in Surveying Engineering
Faculty/University: FCUP, University of Porto
Supervisor: Maria Luísa Bastos
Co-Supervisor: José Alberto Gonçalves
Date: July 2017

Completed Master theses

Name: Adriana Isabel Correia Rego
Thesis title: Exploring polar microbiomes as source of bioactive molecules
Master Degree: MSc in Molecular and Cellular Biology
Faculty/University: ICBAS, University of Porto
Supervisor: Pedro Leão
Co-Supervisor: Catarina Magalhães
Date: November 2017

Name: Aires Miguel Gomes Delgado de Almeida Duarte
Thesis title: Optimization of seedling production using vegetative gametophytes of *Alaria esculenta*
Master Degree: MSc in Functional Biology and Biotechnology of Plants
Faculty/University: FCUP, University of Porto
Supervisor: Isabel Sousa Pinto

Co-Supervisor: Jorunn Skjermo
Date: November 2017

Name: Alexandre Serrão Lopes de Sousa
Thesis title: Análise e consideração de propostas alternativas para os problemas de erosão em Pedrógão
Master Degree: Integrated Master in Civil Engineering
Faculty/University: FEUP, University of Porto
Supervisor: Fernando Veloso Gomes
Date: July 2017

Name: Álvaro Filipe Alves Magalhães
Thesis title: Yicathins B and C: synthesis and in silico ADME properties
Master Degree: MSc in Pharmaceutical Chemistry
Faculty/University: FFUP, University of Porto
Supervisor: Carlos Afonso
Co-Supervisor: Carlos Azevedo
Date: September 2017

Name: Ana Cláudia Bronze Monteiro Martins
Thesis title: Internship on lumpfish production in Nordland Rensefisk AS Evaluation of larval development with two commercial feeds
Master Degree: MSc in Marine Sciences - Marine Resources
Faculty/University: ICBAS, University of Porto
Supervisor: José Fernando Magalhães
Date: July 2017

Name: Ana Cristina Borges Barbosa
Thesis title: Efeitos ecotoxicológicos de microplásticos e outros contaminantes ambientais em *Daphnia magna*
Master Degree: MSc in Environmental Toxicology and Contamination
Faculty/University: ICBAS - FCUP, University of Porto
Supervisor: Lúcia Guilhermino
Date: October 2017

Name: Ana Mafalda Queijo Gonçalves Pinto
Thesis title: Group B *Streptococcus* as an invasive pathogenic in pregnant women
Master Degree: MSc in Cell and Molecular Biology
Faculty/University: FCUP, University of Porto
Supervisor: Olga Lage
Co-Supervisor: José Aires Pereira
Date: November 2017

Name: Ana María Sánchez Tévar
Thesis title: Efecto de distintos aditivos alimentarios en el estado oxidativo hepático de ratas Wistar con tendinopatía inducida
Master Degree: MSc in Drug Research, Development, Control and Innovation
Faculty/University: University of Granada
Supervisor: Amalia Pérez Jiménz
Date: 2017

Name: Ana Rute Ferreira dos Santos
Thesis title: Materiais tridimensionais de grafeno para remoção de elementos potencialmente tóxicos de águas
Master Degree: Integrated Master in Chemical Engineering
Faculty/University: University of Aveiro
Supervisor: Eduarda Pereira
Co-Supervisor: Bruno Henriques and Paula Marques
Date: July 2017

Name: Ana Sofia de Almeida Oliveira
Thesis title: Perspectivas e desafios da gestão integrada das bacias Luso-Espanholas envolvendo a ARH Norte da APA
Master Degree: Integrated Master in Environmental Engineering
Faculty/University: FEUP, University of Porto
Supervisor: Rodrigo Maia
Date: October 2017

Name: André Manuel Gomes dos Santos
Thesis title: Diversity and distribution of freshwater mussels in Morocco
Master Degree: MSc in Ecology
Faculty/University: University of Minho
Supervisor: Ronaldo Sousa
Co-Supervisor: Elsa Froufe
Date: 2017

Name: André Matias Soares
Thesis title: Sand Bypass study. Aveiro Lagoon Mouth and Figueira da Foz River Mouth case studies
Master Degree: Integrated Master in Civil Engineering
Faculty/University: FCUP, University of Porto
Supervisor: Fernando Veloso Gomes
Co-Supervisor(s): Carlos Coelho and Luís Godinho
Date: July 2017

Name: André Pinhal Gonçalves
Thesis title: Implementação de uma solução mobile mapping integrando uma câmara de ação e GNSS de precisão
Master Degree: Mestrado em Engenharia Geográfica
Faculty/University: Universidade do Porto, Faculdade de Ciências
Supervisor: José Alberto Gonçalves
Date: December 2017

Name: António Gaspar Gonçalves de Sousa
Thesis title: Arctic microbiome and N-functions during the winter-spring transition
Master Degree: MSc in Molecular Biology and Genetics
Faculty/University: FCUP, University of Porto
Supervisor: Catarina Magalhães
Co-Supervisor: Luís Torgo and Pedro Duarte
Date: November 2017

Name: Bárbara Andreia Moreira Cavaleiro
Thesis title: Metazoan parasites of Skipjack tuna, *Katsuwonus pelamis* and Almaco jack, *Seriola rivoliana*, two important commercial species from Madeira archipelago, Portugal
Master Degree: MSc in Biological Aquatic Resources
Faculty/University: FCUP, University of Porto
Supervisor: Aurélia Saraiva
Co-Supervisor: Margarida Hermida
Date: June 2017

Name: Beatriz Torgal Martins
Thesis title: Synthetic analogues of marine natural flavonoids as antifouling agents: synthesis and biological evaluation
Master Degree: MSc in Pharmaceutical Chemistry
Faculty/University: FFUP, University of Porto
Supervisor: Honorina Cidade
Co-Supervisor: Marta Correia da Silva
Date: September 2017

Name: Bruno Duarte Lourenço Oliveira
Thesis title: Controlo e avaliação do sistema de tratamento de águas residuais da ETAR de Gaia Litoral e ETAR de Febros
Master Degree: MSc in Biology and Water Quality Management
Faculty/University: FCUP, University of Porto
Supervisor: Natividade Vieira
Date: December 2017

Name: Carla Rafaela Chiquelho da Silva
Thesis title: Avaliação da qualidade e da segurança microbiológica da ostra-do-Pacífico (*Crassostrea gigas*) e do ouriço-do-mar (*Paracentrotus lividus*)

Master Degree: MSc in Food Service Management
Faculty/University: FNAUP, University of Porto
Supervisor: Ângela Rosalina inácio
Co-Supervisor(s): Paulo Vaz Pires and Paulo Martins da Costa
Date: November 2017

Name: Carmen Mariana Pimenta Carvalho Machado
Thesis title: Antitumor chalcone derivatives: synthesis and biological activity evaluation
Master Degree: MSc in Pharmaceutical Chemistry
Faculty/University: FFUP, University of Porto
Supervisor: Honorina Cidade
Co-Supervisor: Patrícia Silva
Date: October 2017

Name: Cátia Carina de Sousa Caetano
Thesis title: Efficiency and risk associated with the use of nickel nanowires for water treatment
Master Degree: MSc in Biology and Water Quality Management
Faculty/University: FCUP, University of Porto
Supervisor: Ruth Pereira
Co-Supervisor: Verónica Nogueira
Date: December 2017

Name: Cátia Sofia da Silva Vilas Boas
Thesis title: Seawater solubility, degradation and leaching of new nature-inspired antifouling compounds
Master Degree: MSc in Quality Control
Faculty/University: FFUP, University of Porto
Supervisor: Marta Correira da Silva
Date: July 2017

Name: Cláudia Patricia Estanqueiro Simões
Thesis title: Remédios do mar: a importância das propriedades antineoplásicas das esponjas marinhas
Master Degree: MSc in Pharmaceutical Sciences
Faculty/University: University Fernando Pessoa
Supervisor: Alberto Teodorico Correira
Date: November 2017

Name: Daniel Filipe Garrido Gavina
Thesis title: Estágio na aquacultura safiestela - avaliação do grau de parentesco entre reprodutores e descendência na fase final de produção de linguado (*Solea senegalensis*)
Master Degree: MSc in Biological Aquatic Resources
Faculty/University: FCUP, University of Porto
Supervisor: Helena Peres
Date: November 2017

Name: Diana Couto dos Santos
Thesis title: Determinação do período reprodutivo da solha das pedras (*Platichthys flesus*) no estuário do rio Douro
Master Degree: MSc in Biological Aquatic Resources
Faculty/University: FCUP, University of Porto
Supervisor: Sandra Ramos
Co-Supervisor: Marta Ferreira
Date: December 2017

Name: Diana Patrícia da Silva Ribeiro
Thesis title: Monitorização de massas de água em contexto urbano
Master Degree: MSc in Chemical Engineering
Faculty/University: ISEP, Polytechnic of Porto
Supervisor: Sónia Figueiredo
Co-Supervisor: Cristina Calheiros
Date: November 2017

Name: Diego José Coronado Calleja
Thesis title: Influencia de distintos tipos de estrés sobre parámetros inmunológicos y de estrés oxidativo en las branquias de la tenca (*Tinca tinca*)
Master Degree: MSc in Drug Research, Development, Control and Innovation
Faculty/University: University of Granada
Supervisor: Amalia Pérez Jiménez
Date: 2017

Name: Diogo Carmo Ramos
Thesis title: Avaliação dos efeitos das alterações climáticas na gestão operacional de uma albufeira do Sistema Hidroelétrico do Cávado
Master Degree: Integrated Master in Civil Engineering
Faculty/University: FEUP, University of Porto
Supervisor: Rodrigo Maia
Date: September 2017

Name: Diogo Jorge Faria Oliveira
Thesis title: Cobalamin receptors: transitions for novel functions?
Master Degree: MSc in Biochemistry
Faculty/University: FCUP - ICBAS, University of Porto
Supervisor: Raquel Ruivo
Co-Supervisor: Luís Filipe Castro
Date: October 2017

Name: Diogo Miguel Cardeano Jorge Nogueira
Thesis title: Veterinary intervention in wildlife recovery centers
Master Degree: Integrated Master in Veterinary Medicine
Faculty/University: University of Trás-os-Montes e Alto Douro
Supervisor: José Manuel Almeida
Co-Supervisor: Filipe da Costa Silva
Date: November 2017

Name: Edite Joana Manjate
Thesis title: The impact of microplastics in fitoremediation of metals by estuarine plants
Master Degree: MSc in Environmental Toxicology and Contamination
Faculty/University: ICBAS - FCUP, University of Porto
Supervisor: Marisa Almeida
Co-Supervisor: Sandra Ramos
Date: November 2017

Name: Elisabete Luís Afonso
Thesis title: Recuperação de elementos críticos de tecnologia usando um nanocompósito à base de grafeno
Master Degree: Integrated Master in Chemical Engineering
Faculty/University: University of Aveiro
Supervisor: Cláudia Lopes
Co-Supervisor:
Date: October 2017

Name: Emanuel José Faria Almada
Thesis title: The potential of Porto Santo Island for aquaculture
Master Degree: MSc in Aquaculture
Faculty/University: School of Tourism and Maritime Technology, IPLeiria
Supervisor: Paulo Maranhão
Date: 2017

Name: Estefanía Espejo Alcaide
Thesis title: Estudio de parámetros relacionados con el estado inmunológico y oxidativo como indicadores de bienestar en *Monodactylus argenteus*
Master Degree: MSc in Drug Research, Development, Control and Innovation
Faculty/University: University of Granada
Supervisor: Amalia Pérez Jiménez
Date: 2017

Name: Fabiana Andreia Pereira Teixeira
Thesis title: Biossorventes de baixo custo para remover contaminantes inorgânicos prioritários de águas
Master Degree: MSc in Chemistry
Faculty/University: FCUP, University of Porto
Supervisor: Eduarda Pereira
Co-Supervisor(s): Bruno Henriques and Paula Figueira
Date: July 2017

Name: Fábio Sabino Teixeira Martins
Thesis title: Seasonal dynamics of macroinvertebrates communities in alpine ponds
Master Degree: MSc in Ecology and Environment
Faculty/University: FCUP, University of Porto
Supervisor: Sara Antunes
Date: November 2017

Name: Fernando Flávio Pagels Salgado
Thesis title: Fluorescent light vs. LED for *Gloeothece* sp. biomass and bioactive compounds production - a promising approach from blue biotechnology?
Master Degree: MSc in Functional Biology and Plant Biotechnology
Faculty/University: FCUP, University of Porto
Supervisor: Ana Catarina Guedes
Co-Supervisor: Tânia Tavares
Date: July 2017

Name: Filipe Miguel Ramos da Cruz Soares
Thesis title: Development of tools for the management of oyster nurseries: static and dynamic modelling
Master Degree: Integrated Master in Environmental Engineering
Faculty/University: FCT-UNL, NOVA
Supervisor: Ana Maria Nobre
Date: November 2017

Name: Flávio Luís de Oliveira
Thesis title: Physiological responses of the marine mussel *Mytilus galloprovincialis* exposed to toxic cyanobacteria *Microcystis aeruginosa* and *Chrysosporum ovalisporum*
Master Degree: MSc in Biology and Water Quality Management
Faculty/University: FCUP, University of Porto
Supervisor: Alexandre Campos
Co-Supervisor: José Carlos Martins
Date: November 2017

Name: Francisca Falcão Vaz Hilário
Thesis title: Clinic and management of wildlife in recovery centers and zoos, its role in wildlife conservation
Master Degree: Integrated Master in Veterinary Medicine
Faculty/University: University of Trás-os-Montes e Alto Douro
Supervisor: José Manuel Almeida
Date: October 2017

Name: Francisca Isabel Alves da Silva Carvalhal
Thesis title: Synthesis and antifouling evalution of nature-inspired compounds
Master Degree: MSc in Pharmaceutical Chemistry
Faculty/University: FFUP, University of Porto
Supervisor: Marta Correia da Silva
Co-Supervisor: Maria Emília Sousa
Date: July 2017

Name: Francisco Maciel Machado Miranda Duarte
Thesis title: Proposta de uma intervenção multifuncional na Praia do Norte, Viana do Castelo
Master Degree: Integrated Master in Civil Engineering
Faculty/University: FEUP, University of Porto
Supervisor: Fernando Veloso Gomes
Date: July 2017

Name: Georges Martins Moita
Thesis title: Veterinary intervention in wildlife recovery centers
Master Degree: Integrated Master in Veterinary Medicine
Faculty/University: University of Trás-os-Montes e Alto Douro
Supervisor: José Manuel Almeida
Co-Supervisor: Ana Coelho
Date: December 2017

Name: Gisana de Freitas Pereira
Thesis title: Analysis of water quality by using diferent methodologies
Master Degree: MSc in Biology and Water Quality Management
Faculty/University: FCUP, University of Porto
Supervisor: Natividade Vieira
Co-Supervisor: Ruth Pereira
Date: November 2017

Name: Gonçalo Sampaio do Monte Garcia
Thesis title: Quebramares nos portos da Região Autónoma dos Açores (R.A.A.)
Master Degree: Integrated Master in Civil Engineering
Faculty/University: FEUP, University of Porto
Supervisor: Fernando Veloso Gomes
Date: July 2017

Name: Guilherme Maria Guimarães de Sequeira Braga
Thesis title: Fatores de confusão em ecotoxicologia: revisão dos efeitos de solventes na história de vida de *Daphnia magna*
Master Degree: MSc in Ecology and Environment
Faculty/University: FCUP, University of Porto
Supervisor: Sara Antunes
Co-Supervisor: Bruno Castro
Date: December 2017

Name: Hélder João Ribeiro de Oliveira
Thesis title: Synthesis of new carboxylic chiral derivatives of xanthones inspired on marine xanthones
Master Degree: MSc in Pharmaceutical Chemistry
Faculty/University: FFUP, University of Porto
Supervisor: Maria Elizabeth Tiritan
Co-Supervisor: Carla Fernandes
Date: October 2017

Name: Henrique Ribeiro de Sousa
Thesis title: Internship Report: Husbandry and handling of aquatic organisms in the CIIMAR Bioterium (BOGA)
Master Degree: MSc in Marine Sciences - Marines Resources
Faculty/University: ICBAS, University of Porto
Supervisor: Hugo Santos
Date: December 2017

Name: Inês Cardoso Ribeiro
Thesis title: A senciência em Decápodes e a sua importância na construção de sistemas enriquecidos - Um projeto no SEA LIFE Porto
Master Degree: MSc in Marine Sciences – Marine Resources
Faculty/University: ICBAS, University of Porto
Supervisor: Ana Sofia Poças da Costa Ferreira
Co-Supervisor: Eduardo Rocha
Date: December 2017

Name: Inês Filipa Coelho Ribeiro
Thesis title: Isolation of Actinobacteria from marine sediments and study of their potential to produce bioactive compounds
Master Degree: MSc in Environmental Toxicology and Contamination
Faculty/University: ICBAS - FUCP, University of Porto
Supervisor: Fátima Carvalho
Co-Supervisor: Filipe Pereira
Date: October 2017

Name: Inês Isabel de Oliveira Canastra
Thesis title: Aquaponia: Construção de um sistema de aquaponia a uma escala modelo e elaboração de um manual didático
Master Degree: MSc in Biological Aquatic Resources
Faculty/University: FCUP, University of Porto
Supervisor: António Paulo Carvalho
Co-Supervisor: Pedro Caels
Date: December 2017

Name: Inês Rosado de Jesus Vitorino
Thesis title: Exploring the secondary metabolite potential of Planctomycetes from marine and freshwater environments
Master Degree: MSc in Biochemistry
Faculty/University: ICBAS - FCUP, University of Porto
Supervisor: Olga Lage
Co-Supervisor: Tanja Schneider
Date: November 2017

Name: Íris Regina Santos Oliveira
Thesis title: Extração e análise de matéria gorda em alimentos: validação de método
Master Degree: MSc in
Faculty/University: University of Aveiro
Supervisor: Eduarda Pereira
Co-Supervisor: Bruno Henriques
Date: July 2017

Name: Isidro José Tamele
Thesis title: Multistressor effects on marine organisms
Master Degree: MSc in Environmental Toxicology and Contamination
Faculty/University: ICBAS - FCUP, University of Porto
Supervisor: Joana Costa
Co-Supervisor: Lúcia Guilhermino
Date: July 2017

Name: Ivanna Hrynchak
Thesis title: Studies towards the synthesis of metabolites of mitoxantrone
Master Degree: MSc in Pharmaceutical Chemistry
Faculty/University: FFUP, University of Porto
Supervisor: Maria Emília Sousa
Co-Supervisor: Vera Costa
Date: October 2017

Name: Jidapa Noinart
Thesis title: Bioactive secondary metabolites from the culture of the marine sponge-associated fungus *Talaromyces stipitatus* KUFA 0207
Master Degree: MSc in Marine Sciences – Marine Resources
Faculty/University: ICBAS, University of Porto
Supervisor: Anake Kijjoa
Date: July 2017

Name: Joana Isabel de Castro Serrão
Thesis title: Histopathological effects of acute exposure to nickel oxide nanoparticles in the aquatic gastropod *Physa acuta*
Master Degree: MSc in Biological Aquatic Resources
Faculty/University: FCUP, University of Porto
Supervisor: Aurélia Saraiva
Co-Supervisor: António Paulo Carvalho
Date: December 2017

Name: Joana Manuela Machado Freitas da Silva
Thesis title: Avaliação do impacto biótico dos antimicrobianos em isolados clínicos obtidos em infeções polimicrobianas
Master Degree: MSc in Applied Microbiology
Faculty/University: Catholic University of Portugal (UCP)
Supervisor: Paulo Martins da Costa
Date: December 2017

Name: Joana Valente Alves da Cunha
Thesis title: Gestão da cadeia de pescado fresco e do aproveitamento de resíduos da Sonae
Master Degree: MSc in Food Science and Technology
Faculty/University: FCUP, University of Porto
Supervisor: Paulo Vaz Pires
Co-Supervisor: Ondina Afonso
Date: November 2017

Name: João André Martins da Rocha
Thesis title: Suitability of marine ornamental shrimp *Lysmata uncicornis* Holthuis and Maurin 1952 to commercial scale aquaculture and comparative performance with *Lysmata seticaudata* (Risso, 1816)
Master Degree: MSc in Biological Aquatic Resources
Faculty/University: FCUP, University of Porto
Supervisor: Ricardo Calado
Co-Supervisor: António Paulo Carvalho
Date: November 2017

Name: João Luís Pinto Ribeiro
Thesis title: Development of new chiral stationary phases for liquid chromatography based on small molecules and polymeric materials
Master Degree: MSc in Pharmaceutical Chemistry
Faculty/University: FFUP, University of Porto
Supervisor: Carla Fernandes
Co-Supervisor: Maria Elizabeth Tiritan
Date: October 2017

Name: João Miguel Beça Magalhães
Thesis title: Aplicação de sistemas de suporte à decisão para a gestão de situações de escassez de água
Master Degree: Integrated Master in Civil Engineering
Faculty/University: FEUP, University of Porto
Supervisor: João Pedro Pêgo
Co-Supervisor: Rodrigo Maia
Date: July 2017

Name: João Nuno Fernandes Fernandes
Thesis title: Potential of mycelium of the soil fungus *Pisolithus tinctorius* as a source of bioactive compounds
Master Degree: MSc in Environmental Toxicology and Contamination
Faculty/University: ICBAS - FCUP, University of Porto
Supervisor: Rui Sérgio Oliveira
Co-Supervisor: Marco Preto
Date: November 2017

Name: João Pedro Figueiredo Pinheiro
Thesis title: Estudo da evolução da batimetria na foz do Rio Douro - análise comparativa, identificação dos fatores geradores de dinâmica e perspetivas futuras
Master Degree: MSc in Marine Sciences - Marine Resources
Faculty/University: ICBAS, University of Porto
Supervisor: Ana Maria Ferreira Bio
Date: December 2017

Name: João Vítor Torres Reis
Thesis title: Internship at Auburn University's Fish and Shrimp Nutrition Lab - The production cycle of *Litopenaeus vannamei* in outdoor ponds and tank culture of *Trachinotus carolinus*
Master Degree: MSc in Biological Aquatic Resources
Faculty/University: FCUP, University of Porto
Supervisor: Aires Oliva Teles
Co-Supervisor: Allen Davis
Date: November 2017

Name: José Diogo Neves dos Santos
Thesis title: Analysis of secondary metabolism in marine Actinobacteria: searching for novel compounds

Master Degree: MSc in Biochemistry
Faculty/University: ICBAS - FCUP, University of Porto
Supervisor: Olga Lage
Co-Supervisor: Tanja Schneider
Date: November 2017

Name: Joseane Augusta Andrade Barros
Thesis title: Estudo toxicológico dos efeitos de um fármaco de uso humano (diclofenac), ao longo de uma cadeia trófica simulada em ambiente marinho
Master Degree: MSc in Environmental Toxicology and Contamination
Faculty/University: ICBAS - FCUP, University of Porto
Supervisor: Bruno Nunes
Co-Supervisor: Alberto Teodorico Correia
Date: October 2017

Name: Lei Man São
Thesis title: Guidelines for an oriented organic waste valorization strategy for Macao
Master Degree: MSc in Environmental Studies and Management
Faculty/University: University of Saint Joseph-Macau
Supervisor: David Gonçalves
Co-Supervisor: Cristina Calheiros
Date: June 2017

Name: Li Man Ho
Thesis title: Adoption of best practices for municipal solid waste recycling management in Macao
Master Degree: MSc in Environmental Studies and Management
Faculty/University: University of Saint Joseph-Macau
Supervisor: Cristina Calheiros
Co-Supervisor: Franz Gassner
Date: June 2017

Name: Liliana da Costa Duarte
Thesis title: Assessment of potentially toxic elements in macroalgae grown in an Integrated Multi Trophic Aquaculture system
Master Degree: MSc in
Faculty/University: University of Aveiro
Supervisor: Bruno Henriques
Co-Supervisor: Eduarda Pereira and Helena Abreu
Date: July 2017

Name: Luísa Ferreira Barros
Thesis title: Promoting species separation in trawl gears by using rigid grids and light systems
Master Degree: MSc in Biological Aquatic Resources
Faculty/University: FCUP, University of Porto
Supervisor: Paulo Santos
Co-Supervisor(s): Paulo Fonseca and Barry O'Neill
Date: July 2017

Name: Mafalda Santos Coutinho
Thesis title: Screening of larvicidal activity of seaweed extracts against the mosquito *Aedes aegypti*
Master Degree: MSc in Environmental Toxicology and Contamination
Faculty/University: ICBAS - FCUP, University of Porto
Supervisor: Alice Abreu
Co-Supervisor: Eduardo Rocha
Date: December 2017

Name: Manuel José Dias da Silva
Thesis title: Conceção de Terminais para Navios Porta-Contentores
Master Degree: Integrated Master in Civil Engineering
Faculty/University: FEUP, University of Porto
Supervisor: Paulo Rosa Santos
Co-Supervisor(s): Francisco Taveira Pinto and Hugo Lopes
Date: September 2017

Name: Maria Carlota Pinto da Silva
Thesis title: Effects of dietary amino acids supplementation on the European seabass (*Dicentrarchus labrax*) skin mucosal immune status
Master Degree: MSc in Marine Sciences – Marine Resources
Faculty/University: ICBAS, University of Porto
Supervisor: Benjamín Costas
Co-Supervisor: António Afonso
Date: December 2017

Name: Maria Celeste Alves Cunha
Thesis title: Execução de ensaios microbiológicos nas áreas alimentar, ambiental e técnica em contexto empresarial
Master Degree: MSc in Food Science and Technology
Faculty/University: FCUP, University of Porto and University of Minho
Supervisor: José Américo Sousa
Co-Supervisor: Sílvia Silva
Date: November 2017

Name: Maria da Conceição Paiva Marinho
Thesis title: Adequacy of bacteria as supplementary food source for *Daphnia magna*
Master Degree: MSc in Ecology and Environment
Faculty/University: FCUP, University of Porto
Supervisor: Sara Antunes
Co-Supervisor: Olga Lage
Date: July 2017

Name: Marina García Vidal
Thesis title: Influencia de distintos tipos de estrés sobre el estado inmunológico y antioxidantes en sangre y mucus del tegumento de la tenca (*Tinca tinca*)
Master Degree: MSc in Drug Research, Development, Control and Innovation
Faculty/University: University of Granada
Supervisor: Amalia Pérez Jiménez
Date: 2017

Name: Marta Ribeiro Carvalho
Thesis title: The n-3 highly unsaturated fatty acids requirement and effect on hepatic composition and histopathology of meagre (*Argyrosomus regius*, Asso, 1801) fingerlings
Master Degree: MSc in Biological Aquatic Resources
Faculty/University: FCUP, University of Porto
Supervisor: Helena Peres
Co-Supervisor: María Soledad Izquierdo
Date: September 2017

Name: Matilde da Fonseca de Oliveira Tenreiro de Matos
Thesis title: Segurança alimentar em pescado
Master Degree: Integrated Master in Veterinary Medicine
Faculty/University: FCUP, University of Trás-os-Montes and Alto Douro
Supervisor: Maria Madalena Vieira-Pinto
Co-Supervisor: Maria João Santos
Date: August 2017

Name: Melanie Audrey Gomes Barbosa
Thesis title: Obesity and environmental pollutants: a reason for concern
Master Degree: MSc in Environmental Toxicology and Contamination
Faculty/University: ICBAS - FCUP, University of Porto
Supervisor: Miguel Santos
Co-Supervisor: Luís Filipe Castro
Date: November 2017

Name: Miguel Ângelo Oliveira Santos
Thesis title: Assessment of edaphic community and distribution in cover vegetation of the Botanical Garden of Porto
Master Degree: MSc in Ecology and Environment

Faculty/University: FCUP, University of Porto
Supervisor: Sara Antunes
Co-Supervisor: Rubim Almeida da Silva
Date: December 2017

Name: Miguel Ângelo Pereira da Costa
Thesis title: Passagem de peixes nos AH da EDPP: Levantamento, estado de conservação e definição de medidas de melhoria
Master Degree: Integrated Master in Environmental Engineering
Faculty/University: FEUP, University of Porto
Supervisor: Rodrigo Maia
Date: July 2017

Name: Nicole Martins Pires
Thesis title: Dietary taurine requirements of European sea bass (*Dicentrarchus labrax,* L.) juveniles
Master Degree: MSc in Biological Aquatic Resources
Faculty/University: FCUP, University of Porto
Supervisor: Helena Peres
Co-Supervisor: Aires Oliva Teles
Date: November 2017

Name: Papichaya Boonpothong
Thesis title: Studies toward the total synthesis of neofiscalin A, a potent antibacterial agent
Master Degree: MSc in Pharmaceutical Chemistry
Faculty/University: FFUP, University of Porto
Supervisor: Maria Emília Sousa
Co-Supervisor: Madalena Pinto
Date: September 2017

Name: Paulo Joaquim da Silva Santos
Thesis title: Seasonal dynamics in cellular and humoral immune parameters in farmed rainbow trout (*Oncorhynchus mykiss*)
Master Degree: Integrated Master in Veterinary Medicine
Faculty/University: ICBAS, University of Porto
Supervisor: Paulo Vaz Pires
Co-Supervisor: Benjamín Costas
Date: June 2017

Name: Paulo Miguel Cardoso Reis
Thesis title: Uranium mining wastes: Bystander and transgenerational effects in *Daphnia magna*
Master Degree: MSc in Biology and Water Quality Management
Faculty/University: FCUP, University of Porto
Supervisor: Ruth Pereira
Co-Supervisor: Joana Lourenço
Date: December 2017

Name: Pedro Emanuel Almeida Leitão
Thesis title: Adoption of different agricultural practices and effects on soil quality
Master Degree: MSc in Environmental Sciences and Technology
Faculty/University: FCUP, University of Porto
Supervisor: Ruth Pereira
Co-Supervisor: Anabela Cachada
Date: December 2017

Name: Pedro Filipe Oliveira da Silva
Thesis title: Colheita sustentável de uma espécie invasora bem-sucedida: Implicações para a comunidade macrozoobentónica
Master Degree: MSc in Ecology
Faculty/University: University of Minho
Supervisor: Martina Ilarri
Co-Supervisor: Ronaldo Sousa
Date: November 2017

Name: Pedro Miguel Mota da Cruz Gomes
Thesis title: Desenvolvimento de um bloco inovador para proteção costeira
Master Degree: Integrated Master in Civil Engineering
Faculty/University: FEUP, University of Porto
Supervisor: Francisco Taveira Pinto
Co-Supervisor: Paulo Rosa Santos
Date: July 2017

Name: Pedro Rodrigues Pires
Thesis title: Planos de emergência de barragens. Definição de caudais críticos para avisos de descargas elevadas. O caso dos aproveitamentos hidroelétricos do Baixo Sabor e Pocinho
Master Degree: Integrated Master in Civil Engineering
Faculty/University: FEUP, University of Porto
Supervisor: Rodrigo Maia
Date: July 2017

Name: Pedro Santos Monteiro Leite da Cunha
Thesis title: DTU Aqua Internship: effects of fatty acids on fish behaviour, and how size affects rainbow trout swimming speed
Master Degree: MSc in Biological Aquatic Resources
Faculty/University: FCUP, University of Porto
Supervisor: Peter Skov
Co-Supervisor: Ana Couto
Date: November 2017

Name: Rafaela Alexandra Perdigão Mendes
Thesis title: Bioremediation for mitigation and recovery from oil spill incidents
Master Degree: MSc in Environmental Toxicology and Contamination
Faculty/University: ICBAS - FCUP, University of Porto
Supervisor: Ana Paula Mucha
Co-Supervisor: Marisa Almeida
Date: November 2017

Name: Raquel Cabrera Benavent
Thesis title: Use of microsatellites in the assignment of parents of *Octopus vulgaris* (Cuvier, 1797) in aquaculture: fine-tuning of the tool
Master Degree: MSc in Aquaculture
Faculty/University: University of Vigo
Supervisor: Montse Pérez
Co-Supervisor: Manuel Nande
Date: June 2017

Name: Raquel de Vila Fontes da Mota Magalhães
Thesis title: Relatório final de estágio: Intervenção técnica, educativa e de investigação no contexto diário da Estação Litoral da Aguda
Master Degree: MSc in Marine Sciences - Marines Resources
Faculty/University: ICBAS, University of Porto
Supervisor: Gerhard Michael Weber
Co-Supervisor: José Pedro Oliveira
Date: December 2017

Name: Raul Fonseca Valente
Thesis title: Looking for the migratory whales: Routes of the baleen whales in the Macaronesia
Master Degree: MSc in Biodiversity, Genetics and Evolution
Faculty/University: FCUP, University of Porto
Supervisor: Isabel Sousa Pinto
Co-Supervisor:
Date: November 2017

Name: Ricardo Manuel Gonçalves Alves
Thesis title: Cytotoxicity induced by extracts/compounds of *Pisolithus tinctorius* spores on human cancer and normal cell lines - evaluation of anticancer potential
Master Degree: MSc in Environmental Toxicology and Contamination

Faculty/University: ICBAS - FCUP, University of Porto
Supervisor:
Co-Supervisor: Marco Preto
Date: November 2017

Name: Ricardo Manuel Pereira Pires
Thesis title: Physiological effects of three different anesthetics: 2-phenoxyethanol, tricaine methanesulfonate and Clove oil on *Sparus aurata*
Master Degree: MSc in Biological Aquatic Resources
Faculty/University: FCUP, University of Porto
Supervisor: Helena Peres
Date: December 2017

Name: Ricardo Nuno Leitão do Espírito Santo
Thesis title: Estudos de produtividade energética de Aproveitamentos Hidroelétricos
Master Degree: Integrated Master in Civil Engineering
Faculty/University: FEUP, University of Porto
Supervisor: Rodrigo Maia
Co-Supervisor: José Manuel Lemos
Date: September 2017

Name: Rita Afonso de Moura Mendes
Thesis title: Molecular monitoring of cyanobacteria and their related toxins in Portuguese freshwater systems
Master Degree: MSc in Environmental Toxicology and Contamination
Faculty/University: ICBAS - FCUP, University of Porto
Supervisor: Cristiana Moreira
Co-Supervisor: Agostinho Pereira
Date: October 2017

Name: Rosana Gomes Monteiro
Thesis title: Variações espaço-temporais na condição fisiológica da espécie invasora *Corbicula fluminea*
Master Degree: MSc in Ecology
Faculty/University: University of Minho
Supervisor: Ronaldo Sousa
Co-Supervisor: Martina Ilarri
Date: November 2017

Name: Sara Raquel Cardoso Coutinho da Rocha
Thesis title: Estágio na empresa Conservas Portugal Norte: Qualidade do pescado e produto final
Master Degree: MSc in Biological Aquatic Resources
Faculty/University: FCUP, University of Porto
Supervisor: Paulo Vaz Pires
Co-Supervisor: Joana Monteiro
Date: November 2017

Name: Sara Raquel Ferreira Alves Martins
Thesis title: Produção de Robalo (*Dicentrarchus labrax*), Ostra (*Crassostrea gigas*), *Ulva* sp. e *Salicornia* sp. em Aquacultura Multitrófica Integrada – IMTA
Master Degree: MSc in Biological Aquatic Resources
Faculty/University: FCUP, University of Porto
Supervisor: Helena Peres
Co-Supervisor: Rui Magalhães
Date: 2017

Name: Soraia Filipa Ribeiro Leite
Thesis title: Estágio fábrica de conservas La Gondola: Influência da temperatura e do tempo de processamento na qualidade e segurança final de lombos de atum
Master Degree: MSc in Food Science and Technology
Faculty/University: FCNAUP, University of Porto
Supervisor: Paulo Vaz Pires
Co-Supervisor: Elisabete Macedo
Date: December 2017

Name: Susana Andreia Teixeira de Barros
Thesis title: Disruption of mevalonate pathway in zebrafish (*Danio rerio*) after chronic exposure to simvastatin: integration of ecological endpoints with key biochemical and molecular markers
Master Degree: MSc in Environmental Toxicology and Contamination
Faculty/University: ICBAS - FCUP, University of Porto
Supervisor: Teresa Neuparth
Co-Supervisor: Miguel Santos
Date: October 2017

Name: Tatiana Ribeiro Fraga
Thesis title: Estudo de metodologias para controlo das reflexões em laboratório
Master Degree: Integrated Master in Civil Engineering
Faculty/University: FEUP, University of Porto
Supervisor: Francisco Taveira Pinto
Co-Supervisor: Paulo Rosa Santos
Date: September 2017

Name: Teresa Patrícia Pedrosa Martins
Thesis title: Genome and bioactivity-guided natural product discovery in cyanobacteria
Master Degree: MSc in Biochemistry
Faculty/University: FCUP - ICBAS, University of Porto
Supervisor: Pedro Leão
Co-Supervisor: Paula Tamagnini
Date: November 2017

Name: Thaís Franco Cavalheri de Oliveira
Thesis title: Microplásticos: um programa de educação ambiental envolvendo diferentes grupos da sociedade
Master Degree: MSc in Biology and Water Quality Management
Faculty/University: FCUP, University of Porto
Supervisor: Ruth Pereira
Date: November 2017

Name: Tiago Afonso Palas e Silva Guimarães
Thesis title: Evaluation of the damage progression and study of wave overtopping in rubble-mound structures
Master Degree: Integrated Master in Civil Engineering
Faculty/University: FEUP, University of Porto
Supervisor: Paulo Rosa Santos
Date: March 2017

Name: Tiago Alberto da Santa Lopes
Thesis title: Effects of dietary micronutrients on the Atlantic salmon (*Salmo salar*) immune status
Master Degree: MSc in Marine Sciences – Marine Resources
Faculty/University: ICBAS, University of Porto
Supervisor: Benjamín Costas
Co-Supervisor: Johan Johansen
Date: December 2017

Name: Tin Shine Aung
Thesis title: Bioactive secondary metabolites from the culture of the marine sponge-associated fungus *Neosartorya fennelliae* KUFA (0811)
Master Degree: MSc in Marine Sciences – Marine Resources
Faculty/University: ICBAS, University of Porto
Supervisor: Anake Kijjoa
Date: November 2017

Name: Uirá Siqueira de Oliveira
Thesis title: Avaliação da dinâmica da comunidade microfitobentônica do rio Sousa
Master Degree: MSc in Biology and Water Quality Management
Faculty/University: FCUP, University of Porto
Supervisor: Natividade Vieira
Co-Supervisor: Nuno Formigo
Date: December 2017

Name: Vanessa Maria Silva Neves
Thesis title: Tagging flounder *Platichthys flesus* - a test of methodologies and an evaluation of behavioural and physiological effects
Master Degree: MSc in Marine Sciences – Marine Resources
Faculty/University: ICBAS, University of Porto
Supervisor: Vânia Freitas
Co-Supervisor: José Carlos Antunes
Date: November 2017

OTHER SCIENTIFIC OUTPUTS

Patents

Inventors: Ozório, R.O.A., Souza, A.T., Pereira, L., Gonçalves, J.F.M., Fernandes, M. Portuguese Patent Application (PPP) No. 110028 2017/04/13 Title: Autonomous aquaculture fish feeding system and operation method thereof. Institutions: CIIMAR, University of Porto and FoodinTech, Lda.

New materials, devices, products and processes, software, computer codes and algorithms

Dunphy M., Stastna M., Lamb K., Subich C., Steinmoeller D., MagalhaeS J.M., da Silva J.C.B. - DJLES: Dubreil-Jacotin-Long Equation SolveR: https://github.com/mdunphy/DJLES.

Magalhaes J.M., Sequeira P., da Silva J.C.B. - IDL® Toolbox development for raw image data processing from the German Aerospace Centre (DLR) TerraSAR-X under the project "MOWADI - 3D MOrphodynamic modelling of WAve Dominated Inlets".

Magalhaes J.M., da Silva J.C.B. - Baines barotropic body forcing algorithm developed using Matlab. Released to Oceanalysis®: https://www.oceanalysis.com/

Prototype of new photobioreactor for microalgae production (rotating flat plate photobioreactor) for autotrophic biofilm production. (Published in: Melo M., Fernandes S., Caetano N., Borges M.T. (2017) Chlorella vulgaris (SAG 211-12) biofilm formation capacity and proposal of a rotating flat plate photobioreactor for more sustainable biomass production. Journal of Applied Phycology, 1-13. DOI:10.1007/s10811-017-1290-4)

Magalhães C., Dias A., Carvalho M.F., Ribeiro H., Torgo L., Borges M.T., Almeida C.M., Tomasino M.P., Mucha A.P., Coelho L. MARINEYE - A prototype for multitrophic ocean monitoring - New autonomous system that integrates different important compartment of Ocean research, generating biological, physical and chemical datasets synchronised in time and space.

SIMBAC model v. 1.9 - Model running on Web Server for prediction of bioaccumulation of organic pollutants through trophic chain and impact in human health - for education, research and decision support: http://insitox.ciimar.up.pt

Budget model for Pacific oyster nurseries: Calculate feeding requirements or maximum stock sustained (Published in: Nobre A.M., Soares F., Ferreira J.G. (2017) A mass balance model to assess food limitation in commercial oyster nurseries. Journal of Shellfish Research 36(3), 738-748. DOI:10.2983/035.036.0323): http://seaplusplus4.com/oysterspatbud.html

Sea++4AlgaePlanning: Online model to calculate water renewal rates and nitrogen limitation for commercial land-based macroalgae farms (Published in Nobre A.M., Valente L.M.P., Neori A. (2017) A nitrogen budget model with a user-friendly interface, to assess water renewal rates and nitrogen limitation in commercial seaweed farms. Journal of Applied Phycology 29(6), 3039-3055. DOI:10.1007/s10811-017-1164-9): http://seaplusplus4.com/algaeplanning.html

Audio/visual and electronic/digital materials

da Silva, J., Magalhaes J. (2017) Internal Waves in the Ocean and Atmosphere. http://jmagalhae0.wixsite.com/internal-waves-

Pinto A. (2017) Infographic for Net-WorksTM project. http://net-works.com/about-net-works/#next-steps

Pinto A. (2017) Animation video for Net-WorksTM project. http://net-works.com/about-net-works/#next-steps

Huet J. (2017) Video for Our Sea Our Life project (Zoological Society of London) - The Blue Quest: http://www.thebluequest.com/videos/

Vieira L.R., Guilhermino L. (2017) New Technologies in Coastal Ecosystem Monitoring. Short Video produced in the scope of ECOSERVICES project.

Ramos V., Vasconcelos V. (2017) A curated database of cyanobacterial strains relevant for modern taxonomy and phylogenetic studies. figshare. https://doi.org/10.6084/m9.figshare.c.3273731.v1

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