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ACTIVITY REPORT 2018



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MESSAGE From the Board



The year 2018 was very relevant for the promotion of scientific employment at CIIMAR, with the awarding of 60 positions for full-time researchers (DL57/2016, Institutional and Individual FCT contracts and Competitive R&D Projects). The setting of more fair and stable contracts, will certainly led to an increasing productivity of our research staff in term of fundraising, students supervision and productivity indicators.

CIIMAR continued the implementation of our strategic projects INNOVMAR (NOVELMAR, INSEAFOOD, ECOSERVICES), CORAL, MARINFO. In 2018, we got significant funds from the approval of 38 new FCT projects, as well as several projects POCTEP, Sudoe and Atlantic Interreg, and H2020 (SponGES, Ignite, Fattycyanos and Emertox). Two large Mobilizing Program projects led by industry – MarValor and MobFood – started also in 2018. In 2018, the sum of the projects in implementation in CIIMAR raised to 25 million euros.

CIIMAR members published 420 papers in internationally peer-reviewed journals and successfully contributed to the graduation of 21 PhD and 82 MSc students.

In 2018, six international patents and one national were submitted, reflecting the increasing impact of our research and the success of the implementation of the measures to increase the technology transfer. A Spin off from CIIMAR – Inclita Seaweed Solutions - was created in 2018.

CIIMAR coordinated the process of application of the CoLAB – Collaborative Laboratory for the Blue Economy (B2E) that was approved by FCT in July 2018. Its implementation is in its way. CIIMAR outreach activities, both indoors and outdoors impacted about 100 000 people.

CIIMAR will strength the brand OCEAN of our university and its role as a major research center in this area, at national and European/International levels.

The director of the Board of CIIMAR

Vitor Vasconcelos

Vitorlasur

ABOUT CIIMAR

NOT HALL MADE CARS

CIIMAR was established in 2000 at the University of Porto and mobilises a multidisciplinary, highly skilled and motivated team that works at the frontier 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

The CIIMAR mission is to promote transdisciplinary research, technological development and training, contributing to advances in scientific knowledge and sustainability of the marine and coastal environments. We provide innovative solutions towards ocean's sustainability, driving oceans value to tackle tomorrow's societal needs. To deliver our mission and build a shared understanding and valorisation of the ocean, CIIMAR is strongly involved in partnerships, public engagement and literacy.

Social Organs

CIIMAR social organs were composed in 2018 as follows:

GENERAL ASSEMBLY	BOARD	FISCAL COUNCIL
President João Coimbra	President Vitor Vasconcelos	President Luísa Bastos
 Chairs > Aires Oliva Teles > Fernando Veloso Gomes > Aurélia Saraiva > Ana Paula Mucha 	 Board members Luísa Valente Maria Natividade Vieira Filipe Castro Miguel Alberto Santos 	Members > José Fernando Gonçalves > Helena 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 follows a market driven approach to support the development of a sustainable blue economy, while tackling important societal challenges. Through the implementation of Large Scale Mobilizing R&TD Programs, R&D projects in co-promotion with companies and the CIIMAR's Blue Business Development Platform, the Centre promotes the transfer of knowledge, fostering the development of new technologies, products and services with a strong technology and innovation component.

Disruptive ideas and technologies are driven to acceleration programmes, such as BIP – Business Ignition Programme and Blue Bio Value, enabling knowledge value creation through entrepreneurship.

CIIMAR is a founding member of the National Maritime Cluster – Forum Oceano, the Blue Bio Alliance, and more recently, the B2E CoLAB – Collaborative Laboratory for Blue Economy.



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, Ponds with Life and CIIMAR at School. CIIMAR is also responsible for various Traveling Exhibitions ("Plastic Sea", "Marine Monsters", "Amphibians: a paw on land, another on earth") and participates in numerous public events and science communication displays aimed to promote the dissemination of CIIMAR's research to society. CIIMAR Open Day, coinciding with Leixões Port Day at 15 September 2018, constituted a major dissemination event, with over 25.000 visitors.

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 with ecological, compounds 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.



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



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



P.I. Vitor Vasconcelos

RESEARCH STRUCTURE

RESEARCH LINES	RESEARCH GROUPS	RESEARCH TEAMS
	EVOLUTIONARY GENOMICS AND BLUE	EVOLUTIONARY GENOMICS
		BLUE BIOTECHNOLOGY AND ECOTOXICOLOGY
	BIOTECHNOLOGY	EMERGENT BIOTECHNOLOGIES AND SEAFOOD PROCESSING
		CYANOBACTERIAL NATURAL PRODUCTS
MARINE BIOTECHNOLOGY	NATURAL PRODUCTS AND MEDICINAL	CHEMISTRY AND BIOLOGICAL ACTIVITY OF MARINE NATURAL PRODUCTS
	CHEMISTRY	MEDICINAL CHEMISTRY: DRUG DISCOVERY AND DRUG DESIGN
	BIOREMEDIATION PROCESSES	BIOREMEDIATION AND ECOSYSTEMS FUNCTIONING
	ANIMAL PHYSIOLOGY AND Functional genomics	ANIMAL GENETICS AND EVOLUTION
		HISTOMORPHOLOGY, PHYSIOPATHOLOGY AND APPLIED TOXICOLOGY
		MOLECULAR PHYSIOLOGY
		ECOPHYSIOLOGY
BIOLOGY, AQUACULTURE		NUTRITION AND IMMUNOBIOLOGY
& SEAFOOD QUALITY	ANIMAL NUIRIIIUN AND HEALIH	ANIMAL PATHOLOGY
	AQUACULTURE AND SEAFOOD SAFETY	NUTRITION, GROWTH AND QUALITY OF FISH
		SAFE AND HEALTHY SEAFOOD AND SUSTAINABLE CONSUMPTION
	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
		HYDROBIOLOGY
GLOBAL CHANGES &	AQUATIC BIODIVERSITY AND	ESTUARINE ECOLOGY AND BIOLOGICAL INVASIONS
ECOSYSTEMS SERVICES	CONSERVATION	AQUATIC ECOLOGY AND EVOLUTION
		COASTAL BIODIVERSITY
		COASTAL AND OCEAN DYNAMICS
	OCEAN DYNAMICS, COASTAL	COASTAL MONITORING AND MANAGEMENT
	AND WATER SYSTEMS	MARINE ENERGY
10		WATER RESOURCES SYSTEMS
	LAW OF THE SEA	LAW OF THE SEA

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.

The Blue Business Development Platform supports knowledgebased value creation, contributing to the competitiveness and sustainability of the blue economy.





Inspired by the Ocean Driven by the Market Powered by Knowledge

The main objective of the B2E CoLAB is to create highly-skilled jobs and increase economic and social value through the development of knowledge-based activities supported by the implementation of research and innovation agendas. The B2E CoLAB is complementing and reinforcing the current landscape of R&D units, already part of the present consortium, by stimulating an active participation of scientific/ academic, business and public communities in the analysis and solution of large scale and complex problems sustainably associated with the use of marine bioresources. This challenge will be successfully addressed through a multidisciplinary, interdisciplinary and multi-institutional approach to address the following goals and

- > Creation of highly-skilled jobs to enhance the economic and social value of two of the Blue Growth sectors with the highest potential: Biotechnology and
- > Stablish synergies and multi-/interdisciplinary activities among complementary partners acting in the sustainable use of marine bioresources to improve the technological intensity level and knowledge of the goods and services produced;
- > Contribute to policy making on the strategic management of wild marine
- > Fostering marine biorefinery frameworks securing full valorisation of biological



- **BIORESOURCES AND BIOECONOMY**
- SUSTAINABLE AQUACULTURE 4.0
- TOOLS FOR SEAFOOD SAFETY AND CERTIFICATION
- **CIRCULAR ECONOMY AND BLUE GROWTH**
- HIGHLY-SKILLED JOBS IN BLUE BIOECONOMY

B2E CoLAB Research & Innovation fields

NATURAL RESOURCES

New uses and valorisation

MARINE BIOTECHNOLOGY

Sustainability and new products

SUSTAINABLE AQUACULTURE

Species diversification and enabling technologies

B2E CoLAB Participating Entities





FACTS & FIGURES





SCIENTIFIC PRODUCTIVITY





NR OF PUBLICATIONS IN PEER



COMPETITIVE R&D PROJECT FUNDING

Total competitive funding attributed to CIIMAR in R&D projects in execution during 2018





OUTREACH ACTIVITIES



JAN

HiTech Program Presentation

Euromarine General Assembly Meeting at CIIMAR

Workshop "Sharing best practice in marine conservation and research", in collaboration with ZSL

Workshop "INSEAFOOD - Innovation and Valorization of Marine Food Resources"

BLUEHUMAN Project Kick-off

Workshop "Science Communication at the Digital Crossroad"

FEB

Lauching of CIIMAR Spinoff ISS – Ínclita Seaweed Solutions

Launching Session 3rd edition of Business Ignition Programme (BIP) and "Blue Ocean Strategy" Bootcamp

MOSES Project Kick-off

Competition Splash! by Mermaid Investments

Expedition "Our Sea, Our Life", Mozambique

MAR

18th CIIMAR Anniversary

CIIMAR at EOOS Forum "Integrated and Sustained Ocean Observing: a European Strategy", Brussels

Workshop "NOVELMAR - Novel marine products with biotechnological applications"

CIIMAR at "Conservation of Oceans and Marine Ecosystems", Photo Ark Project, National Geographic

Launching of the book "Guidelines and Protocols for Environmental Monitoring and Impact Assessment of Hazardous and Noxious Substances (HNS)"

2018 AT A GLANCE

JUL

CIIMAR at 4th GEO Blue Planet Symposium, France

CIIMAR at Encontro Ciência 2018 – Science and Technology Summit in Portugal

Scientific Merit Medal awarded to Professor João Coimbra at Encontro Ciência 2018

CIIMAR at Junior University and Bandeira Azul Program

CIIMAR and Chouaib Doukkali University (Morocco) Cooperation Agreement

CIIMAR at Belém All-Atlantic Ocean Research Forum, Brazil

Approval of CoLAB B2E: Collaborative Laboratory for Blue Bioeconomy

AUG

Scientific expedition to the Kronebreen glacier at the Arctic Ocean onboard the RV LANCE, Norwegian Polar Institute

Teachers Formation course "Experimental Education on Marine Sciences"

Scientific expedition "Exploiting and Conserving Deep-Sea Genetic Resources" to the Irish slope canyons, onboard RV Celtic Explorer, NUI Galway

SEP

CIIMAR Open Day and Leixões Port Day

CIIMAR at Oceans Meeting 2018 and AQUAPORTO 2018

Workshop "Ocean Dynamics, Coastal and Water Systems: Assessing Potential Synergies"

Advanced Course "Statistics and Programming with R for Biological Sciences"

31th ESCPB Congress at CIIMAR

CIIMAR at the Intergovernmental Conference on Marine Biodiversity of Areas Beyond National Jurisdiction, UN

Online Course "Oyster Production Technologies"

APR

CIIMAR at Mostra UP

EMERTOX Project Kick-off, Workshop and international conference, Cape Verde

Workshop "Scientific. Technical and legal challenges of deep sea mining. A vision for Portugal"

BIP Final Pitch Day 3rd Edition: Snack for Fish wins first prize, IDENTIFICA winds second prize

Workshop "Modelling Ocean Plastics Litter in a Changing Climate: Challenges and Mitigations"

MAY

Advanced Course "Laboratory Aquatic Animal Sciences" (CAL-AQUA)

Rapporteurs of the Strategic Think Tank "The Portuguese Blue Bioeconomy's Role: National solutions for global challenges"

Teachers Formation Course "Ponds with Life"

Expedition "Exploring Front with Multiple Robots" in a subtropical front in Pacific, onboard RV FALKOR, Schmidt Ocean Institute

CIIMAR integrates European Projects ALERTOX-NET and ENHANCE MICROALGAE

JUN

CIIMAR at GreenFest, Braga

Launching of "Oyster Cultivation and Good Practices in Portugal Manual"

Advanced Course "Marine Natural Products: Discovery and Structure Elucidation"

MarinEye Project awarded Honorable Mention Prize "The Best of Technological Portugal"

Exhibition "Plastic Sea" at Observatory of the Environment of Azores

Launching of BYT 5th edition

OCT

BLUEandGREEN Legacy Conference "Adding value to Marine Bioresources"

CIIMAR at Biomarine Business Convention 2018

CIIMAR Annual Meeting 2018

SpilLess Project wins Atlantic Project Awards 2018 for promotion of entrepreneurship and innovation

MARINER Project wins Atlantic Project Awards 2018 for international cooperation

Symposium "Aquaculture: building bridges between industry and research"

NOV

Advanced Course "High Throughput Screening and Safety"

CIIMAR at Business2Sea 2018

Workshop SpilLess "First-line response to oil spills based on native microorganisms cooperation"

Final Workshop INNOVMAR "Innovation and Sustainability in the Management and Exploitation of Marine Resources"

CIIMAR at ASPIRE Workshop, USA

CIIMAR at Our Atlantic Ocean for Growth and Well-being, Cape Verde

CIIMAR at 4th High Level Industry-Science-Government Dialogue, Gran Canaria

Exhibition "Plastic Sea" at Moita

DEC

ClIMAR researcher Anake Kijjoa distinguished as Honorary Doctorate on Pharmaceutical Sciences in Thailand

Workshop Aqualmprove

Final Workshop "CORAL – Sustainable Ocean Exploitation"

CIIMAR at #24HoursofReality "Protect Our Planet, Protect Ourselves"

Snack for Fish wins Born from Knowledge (BfK) Ideas 2018

Advanced Course "Laboratory Aquatic Animal Sciences (CAL-AQUA)





















2018 AT A GLANCE





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PROJECT HIGHLIGHTS

H2020 PROGRAM

FATTYCYANOS – FATTY ACID INCORPORATION AND MODIFICATION IN CYANOBACTERIAL NATURAL PRODUCTS

PRINCIPAL INVESTIGATOR AT CIIMAR Pedro Leão

> LEADER INSTITUTION CIIMAR-UP





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.

PRINCIPAL INVESTIGATOR AT CIIMAR Vitor Vasconcelos

LEADER INSTITUTION CIIMAR-UP

WEBSITE

www.ciimar.up.pt/BLUEandGREEN/







GENIALG GENIALG – GENETIC DIVERSITY EXPLOITATION FOR INNOVATIVE MACRO-ALGAL BIOREFINERY

PRINCIPAL INVESTIGATOR AT CIIMAR Isabel Sousa Pinto

LEADER INSTITUTION Centre National de la

Recherche Scientifique, France

WEBSITE genialgproject.eu

> Twitter @genialg eu



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.

PRINCIPAL INVESTIGATOR AT CIIMAR Vitor Vasconcelos

LEADER INSTITUTION IS Global, Spain

WEBSITE

www.nomorfilm.eu





H2020 PROGRAM

SEAFOOD

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

PRINCIPAL INVESTIGATOR AT CIIMAR M^a Leonor Nunes

LEADER INSTITUTION

WEBSITE 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.





SponGES – DEEP–SEA SPONGE GROUNDS ECOSYSTEMS OF THE NORTH ATLANTIC: AN INTEGRATED APPROACH TOWARDS THEIR PRESERVATION AND SUSTAINABLE EXPLOITATION



The objective of SponGES is to develop an integrated ecosystem-based approach to preserve and sustainably use vulnerable sponge ecosystems of the North Atlantic. The SponGES consortium, an international and interdisciplinary collaboration of research institutions, environmental non-governmental and intergovernmental organizations, will focus on one of the most diverse, ecologically and biologically important and vulnerable marine ecosystems of the deep-sea - sponge grounds - that to date have received very little research and conservation attention. Our approach will address the scope and challenges of EC's Blue Growth Call by strengthening the knowledge base, improving innovation, predicting changes, and providing decision support tools for management and sustainable use of marine resources. SponGES will fill knowledge gaps on vulnerable sponge ecosystems and provide guidelines for their preservation and sustainable exploitation. North Atlantic deep-sea sponge grounds will be mapped and characterized, and a geographical information system on sponge grounds will be developed to determine drivers of past and present distribution. Diversity, biogeographic and connectivity patterns will be investigated through a genomic approach. Function of sponge ecosystems and the goods and services they provide, e.g. in habitat provision, bentho-pelagic coupling and biogeochemical cycling will be identified and quantified. This project will further unlock the potential of sponge grounds for innovative blue biotechnology namely towards drug discovery and tissue engineering. It will improve predictive capacities by quantifying threats related to fishing, climate change, and local disturbances.

SponGES outputs will form the basis for modeling and predicting future ecosystem dynamics under environmental changes. SponGES will develop an adaptive ecosystem-based management plan that enables conservation and good governance of these marine resources on regional and international levels.

PRINCIPAL INVESTIGATOR AT CIIMAR Joana Xavier

LEADER INSTITUTION University of Bergen, Norway

WEBSITE

www.deepseasponges.org





∞ ignite IGNITE - COMPARATIVE GENOMICS OF NON-MODEL INVERTEBRATES

PRINCIPAL INVESTIGATOR AT CIIMAR Agostinho Antunes

LEADER INSTITUTION

Ludwig-Maximilians – Munich University, Germany

WEBSITE

http://www.itn-ignite.eu/

FACEBOOK itnignite/



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 socioeconomic 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.



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

EMERTOX aims at mapping the actual situation in emergent marine toxins and the producing organisms, developing new approaches to assess their occurrence and predicting the possible future scenarios in the framework of global warming. The partnership, 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 objectives are:

- to assess the current situation on potentially harmful algae and bacteria and the relevant emerging toxins in 8 countries belonging to different but geographically connected areas (Mediterranean Sea and North Atlantic);
- to develop innovative approaches to sample, and analyze the producing organisms and their toxins by chemical and biological methods including immunoassays and sensors;
- to estimate different future scenarios based on molecular data (routes of dispersion) and modelling.





PRINCIPAL INVESTIGATOR AT CLIMAR Vitor Vasconcelos

LEADER INSTITUTION CIIMAR-UP





ATLANTOS – OPTIMISING AND ENHANCING THE INTEGRATED ATLANTIC OCEAN OBSERVING SYSTEMS

PRINCIPAL INVESTIGATOR AT CIIMAR Isabel Sousa Pinto

LEADER INSTITUTION

GEOMAR - Helmholtz Centre for Ocean Research Kiel, Germany

WEBSITE

www.atlantos-h2020.eu



The overarching objective of AtlantOS is to achieve a transition from a looselycoordinated 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.



H2020 PROGRAM

ASSEMBLE PLUS – ASSOCIATION OF EUROPEAN MARINE BIOLOGICAL LABORATORIES EXPANDED

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.

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SEA CHANGE



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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.


CORAL – SUSTAINABLE OCEAN EXPLOITATION: TOOLS AND SENSORS

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

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organisms in rearing conditions (e.g. aquaculture), but also to exactly anticipate negative impacts in humans and wildlife via the development of biological sensors.



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

PRINCIPAL INVESTIGATOR AT CIIMAR

Vitor Vasconcelos (INNOVMAR, NOVELMAR), Luísa Valente (INSEAFOOD), Lúcia Guilhermino (ECOSERVICES)

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UNIÃO EUROPEIA Fundo Europeu de Deservolvimento Regional **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.





MARINFO – INTEGRATED PLATFORM FOR MARINE DATA ACQUISITION AND ANALYSIS

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UNIÃO EUROPEIA Fundo Europeu de Desenvolvimento Region 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.

Marlnfo 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

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.

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Lisb@2020

CRESC ALGARVE 2020







being consumer-driven.



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

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The main goals will be attained through the implementation of the solution in three fundamental principles: "Food Safety and Sustainability", "Food for Health and Wellbeing" 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".



MARINALGAE4AQUA – 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:

- 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.
- Identifying novel feed additives to improve fish digestive capacity and nutrient metabolism upon using the selected algae.
- 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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Spilless SPILLESS - FIRST LINE RESPONSE TO OIL SPILLS BASED ON NATIVE MICROORGANISMS COOPERATION

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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.





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

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.

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

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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.







EBB – EUROPEAN MARINE BIOLOGICAL RESOURCE CENTRE BANK



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:

- Setting up technological tools and common procedures for the ex-situ maintenance of MBRs along the whole phylogenetic tree of life; and:
- 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.
- 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.



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🔆 R A S O R G M A T

TRANSNATIONAL RESEARCH AND INNOVATION

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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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 O₂, the production of CO₂ 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 CO₂, 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.



REWATER

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EPHEMARE – ECOTOXICOLOGICAL EFFECTS OF MICROPLASTICS IN MARINE ECOSYSTEMS

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REPÚBLICA PORTUGUESA 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.



MiningImpact2 – ENVIRONMENTAL IMPACT AND RISKS OF DEEP-SEA MINING



The MiningImpact project gathers 32 partners from 10 different countries and will set up a comprehensive monitoring programme of the impact of an industrial test to harvest manganese nodules in the Clarion Clipperton Zone, by the Belgian contractor DEME-GSR. Polymetallic nodules are mainly composed of manganese and iron oxides, but also contain economically valuable metals, such as nickel, copper, cobalt, lithium, and rare earth elements.

The DEME-GSR collector test intends to harvest nodules in approx. 01 km² large areas of the seabed in the Belgian and the German contract areas of the Clarion Clipperton Zone in the Eastern Equatorial Pacific Ocean. Within the lifetime of MiningImpact researchers are planning two cruises to the test areas in order to constrain the spatial and temporal dynamics of the sediment plume created by the mining test and impact on the abyssal environment.

The project will further study regional connectivity of species in the deep-sea and their resilience to impacts, and the integrated effects on ecosystem functions, such as the benthic food-web and biogeochemical processes.

In this context, key objectives of the project are:

- To develop and test monitoring concepts and strategies for deep-sea mining operations
- To develop standardization procedures for monitoring and definitions for indicators of a good environmental status
- To investigate potential mitigation measures, such as spatial management plans of mining operations and means to facilitate ecosystem recovery
- To develop sound methodologies to assess the environmental risks and estimate benefits, costs and risks
- To explore how uncertainties in the knowledge of impacts can be implemented into appropriate regulatory frameworks

MiningImpact will be able to further close existing knowledge gaps and reduce uncertainties on the environmental impacts of deep-sea mining of polymetallic nodules. The project will specifically work towards policy recommendations and has reached out to the International Seabed Authority to become a partner in the project. It will further contribute to the preparation of environmental impact assessments (EIAs) for future European deep-sea pilot mining tests that are requested by the ISA, and to the Horizon2020 technology development projects Blue Atlantis and Blue Nodules. PRINCIPAL INVESTIGATOR AT CIIMAR Francisco Arenas/Teresa Amaro

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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.





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

MIGRA

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 sociopolitical 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 socioeconomic development of cross-border territory, by of commercial activities such as fishing, tourism or energy sector.



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SUDOANG – PROMOTE CONCERTED AND SUSTAINABLE MANAGEMENT OF EEL IN SUDOE AREA

PRINCIPAL INVESTIGATOR AT CIIMAR José Carlos Antunes

> LEADER INSTITUTION AZTI

> > WEBSITE sudoang.eu



The abundance of the European eel (*Anguilla anguilla*) has been declining in the last 50 years and is outside safe limits. For this reason, the European eel has been included in the IUCN Red List of threatened species.

The SUDOANG project arises to try revert several conditions that restrain the recovery of the eel stock, namely:

- The lack of data and the variability of assessment methods limit the scope and effectiveness of the population monitoring.
- Although the European eel is a single fish stock, it is assessed and managed as separate units.
- There is a lack of dialogue and common strategies between the stakeholders (scientists, managers, fishermen, NGOs) and at different levels local / regional / national).

The SUDOANG project is co-financed by the ERDF through the Sudoe program, with a total budget of 1.6 million. In order to carry out the project, a partnership has been built that includes the entire value chain related to the management of the eel in the SUDOE area: 10 research centers and 27 associated partners including local, regional and national managers, NGOs and associations of fishermen.



MOSES – MARITIME, OCEAN SECTOR AND ECOSYSTEM SUSTAINABILITY: FOSTERING BLUE GROWTH IN ATLANTIC INDUSTRIES



The MOSES objectives of the MOSES project is to examine the 'blue' growth path for the sustainable development of the major sectors operating in the Atlantic space as envisaged in the Atlantic Action Plan. MOSES will quantify blue growth for key marine sectors and develop a common methodology for the quantitative assessment of sectoral pressures on the marine environment and the vulnerability of marine and coastal areas. The methodology will contribute to the joint implementation of integrated marine industry sustainability assessment toolkits across the Atlantic region.

To achieve these aims the consortium will work on four major blocks:

- Evaluate the evolution of the Atlantic marine sectors using the previous Atlantic Area project MARNET framework;
- Examine the sectoral pressures on the Atlantic marine environment in order to identify best management practices;
- Assess the vulnerability of coastal marine areas/features to marine sector to the identified sectoral pressures;
- Using case studies, develop sustainable transition plans to blue growth for a number of key marine sectors and test policies for how well they manage activities to meet Marine Spatial Planning and Maritime Strategy Framework Directive goals.

PRINCIPAL INVESTIGATOR AT CIIMAR João Coimbra

LEADER INSTITUTION

National University of Ireland, Galway

WEBSITE http://mosesproject.eu/





EMBRC-PT – EUROPEAN MARINE BIOLOGICAL RESOURCE CENTRE – PORTUGAL

PRINCIPAL INVESTIGATOR AT CIIMAR Vitor Vasconcelos

> LEADER INSTITUTION CCMAR

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REPÚBLICA PORTUGUESA 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.







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, longterm 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.



PRINCIPAL INVESTIGATOR AT CIIMAR Luisa Bastos LEADER INSTITUTION IPMA COMPETE 2020 COMPETE 2020

> REPÚBLICA PORTUGUESA

Business Ignition Programme **BIP** – BUSINESS IGNITION PROGRAMME

PRINCIPAL INVESTIGATOR AT CIIMAR Susana Moreira

> LEADER INSTITUTION University of Porto

> > WEBSITE 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.





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.

PRINCIPAL INVESTIGATOR AT CIIMAR Pedro Leão

LEADER INSTITUTION

Université de La Rochelle, France

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EDUCATION & TRAINING

MALIA- MARINE LITTER AWARENESS THROUGH LEARNING BY DOING TOGETHER

PRINCIPAL INVESTIGATOR AT CIIMAR Marisa Almeida

LEADER INSTITUTION Instituto Enseñanza Secundaria Europa, Spain



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:

- To enhance integration between four educational centers and four local civil association networks towards enhancing intercultural competences on marine science and community participatory outreach.
- 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.
- 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.





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

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.

school community and general public about the problem of plastic marine debris.

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







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

PRINCIPAL INVESTIGATOR AT CIIMAR Laura Guimarães, 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.



Project		PI at CIIMAR	Leader Institutio
SeXomics - Sex a perpetuation of a	and the environment: Genomic decoding and the animal life in a changing world	Agostinho Antunes	CIIMAR
MOREBIVALVES - commercial bival	Molecular strategies to be applied in the depuration of lves for elimination of toxic compounds	Alexandre Campos	CIIMAR
NANOSED - Adso what implication	orption of metallic nanoparticles to estuarine sediments: for denitrification?	Ana Mafalda Baptista	CIIMAR
BIOREM - Biorem microorganisms i	ediation of hydrocarbon pollutants by autochthonous in aquatic environment	Ana Paula Mucha	CIIMAR
INFLAMMAA - Un tryptophan durin	raveling neuro-endocrine/immune modulatory roles of g inflammation	Benjamin Costas	CIIMAR
NITROLIMIT - Life the Extreme Anta	e at the Edge: Define the Boundaries of the Nitrogen Cycle i arctic Environments	in Catarina Magalhaes	CIIMAR
UNNOWN - UNdis iNoculation: findi removal	scovered Nitrogen micrOrganisms for Wastewater ng efficient microbial seed sludges for wastewater nitroge	Catarina Teixeira n	CIIMAR
ConBiOmics - Th Bivalves	e missing approach for the Conservation of freshwater	Elsa Froufe	CIIMAR
ACTINODEEPSEA deep-sea waters pharmaceutical a	- Bioprospecting actinobacteria from Portuguese for the production of novel secondary metabolites with and biotechnological applications	Fátima Carvalho	CIIMAR
EsCo Ensembles anthropogenic, e	- Estuarine and coastal numerical modeling ensembles fo xtreme events and climate change scenarios	or Fernando Veloso Gomes	CIIMAR
EvoDis - The Met EVOlution to DISr	azoan Endocrine System in the Anthropocene Epoch: from uption	n Filipe Castro	CIIMAR
SeeingShore - U	nderstanting and predicting the impact of climate change	Francisco Arenas	CIIMAR

Project	PI at CIIMAR	Leader Institution
CY-SENSORS - Biosensor and biomimetic recognition element based devices for detection and separation of cyanobacteria metabolites with ecotoxicological and therapeutical applications	Isabel Cunha	CIIMAR
nascem - Novel eco-friendly Antifouling Strategies based on Cyanobacterial bioactivE Metabolites	Joana Reis Almeida	CIIMAR
SWUAV - Mapping the intertidal zone and assessing seaweed biomass using UAV images	José Alberto Gonçalves	CIIMAR
Val-WRACK - Wrack as a high value resource in a global warming scenario. Is it worthy to invest on it?	Marcos Rubal	CIIMAR
Sea Antimicrobials - Antimicrobials from the sea: models for innovative agents to revert multidrug resistance	Emilia Sousa	CIIMAR
CYANCAN - Uncovering the cyanobacterial chemical diversity: the search for novel anticancer compounds	Mariana Reis	CIIMAR
CanAdapt - Understanding Darwinian cancer evolution at the single-cell level	Miguel Fonseca	CIIMAR
SYMBIOMICS - Omics of marine symbioses: Metabarcoding and metagenomics characterizatio of host-microbe adaptation and novel biosysthetic gene clusters	Parthibaraj Anoop Alex	CIIMAR
GLOBALED - Impacts of global change on environmentally realistic mixtures of endocrine disruptor compounds on the structure and functioning of coastal ecosystems? Implications for a sustainable environment	Patricia Teixeira	CIIMAR
HALVERSITY - Genetic and chemical diversity of a novel halogenase class	Pedro Leão	CIIMAR
BUSHRISK - Tracking the bushmeat: a molecular framework for tracing the African bushmeat trade and risks of emerging diseases	Philippe Gaubert	CIIMAR
ECOS - New tools to evaluate the ecological status of rocky shores and its relationship with ecosystem services	Puri Veiga	CIIMAR
ReDEFine - A multi-scale and multi-tiered toolbox for assessing ecosystem quality of freshwater reservoirs: bridging the gaps of the water framework directive approach	Sara Antunes	CIIMAR

Project	PI at CIIMAR	Leader Institution
CRAGIAMP - Search for Antimicrobial Peptides in <i>Crassostrea gigas</i> oysters and <i>Paracentrotus lividus</i> sea urchin. Diminution of mortality rate in oyster culture: towards to a lower impact of diseases in oyster farms and search for novel compunds	Sergio Boo	CIIMAR
FunG-Eye - A functional approach to unravel the interaction between fungicide pollution and fungi-mediated ecosystem processes	Sara Antunes	U. MINHO
a&bm - The Sea and the Shore, Architecture and Marine Biology: The Impact of Sea Life on the Built Environment	Elsa Froufe	U. MINHO
NanoLegaTox - When old meets new: A novelty study on the human uptake, genotoxicity and immunotoxicity of nanoparticles and legacy contaminants mixtures	Miguel Santos	ISP - UP
MicroPlasTox - Microplastics in the marine environment: estimation and assessment of their ecotoxicological effects	Ruth Pereira	U. AVEIRO
CyanoVaccine - Cyanobacterial outer membrane vesicles as novel platforms for Vaccine technology	Cláudia Serra	IBMC
CIGUA - The rise of toxic tropical and subtropical marine dinoflagellates Gambierdiscus spp: distribution, ciguatoxins trophic transfer and risk of ciguatera fish poisoning	Alexandre Campos	IPMA
LIFELINE - Understanding temporal changes in aquatic biodiversity and their consequences for ecosystem functioning and services	Marina Dolbeth	FCIÊNCIAS.ID
E-IMUNO - Applying elasmobranch immunogenetics to fisheries management and the study of vertebrate adaptive immunity	Filipe Castro	ICETA-UP
Linguatox - Bioelectronic Tongue System for the Paralytic Toxins detection in shellfis	Carlos Vale	U. AVEIRO
MP-BITOX - Microplastics in bivalves: identification of sensitive species in Portugal and assessment of microplastic-toxin aggregates toxicity	Carlos Vale	IPMA
RemediGrass - Seagrass beds as green and blue infrastructures for ecosystem restoration	Marina Dolbeth	U. AVEIRO
ROSM - Robotic Oil Spill Mitigation	Ana Paula Mucha	ISEP

Project	PI at CIIMAR	Leader Institution
CyanoTox - Assessment of cyanobacterial toxins in aquatic systems: environmental impacts and development of new methodologies for their early detection	Cristiana Moreira	CIIMAR
SENSORY-OMICS - Animal sensory diversity: innovative genomic solutions to enhance perception of environmental stimuli	Agostinho Antunes	CIIMAR
Antilncrustante - Overcoming environmental problems associated with antifouling agents: synthesis of Natureinspired nontoxic biocides and immobilization in polymeric coatings	Marta Carvalho Guerra	CIIMAR
ZEBRALGRE - From zebrafish to meagre: use of macro- and microalgae as functional feeds	Paula Enes	CIIMAR
EICOBREAM - Effects of fatty acid source (N-6 vs. N-3) on the eicosanoid cascade and intestine inflammation in gilthead sea bream (<i>Sparus aurata</i>)	Aires Oliva Teles	CIIMAR
Quimioterápicos - Navigating through marine-derived fungi: bioprospection and synthesis of bioactive secondary metabolites and analogues as chemotherapic agents	Madalena Pinto	CIIMAR
ALGAFISH - Inclusion of microalgas in sea bass diets: boosting immunity through nutrition	Ana Isabel Couto	CIIMAR
PLASTICGLOBAL - Assessment of plasticmediated chemicals transfer and effects in food webs of deep, coastal and estuarine ecosystems under global change scenarios	Lúcia Guilhermino	CIIMAR
FRESHCO - Multiple implications of invasive species on Freshwater Mussel coextinction processes	Elsa Froufe	I. P. BRAGANÇA
DINOSSAUR - DINOflagellates for Sustained Supply of Active compoUnds in optimized photobioReactors	Ana Catarina Guedes	FEUP
QUIMIOCARDIOTOX - Poisoning the heart with anticancer drugs: is metabolic bioactivation or aging promotion the link to the cardiotoxicity of anticancer drugs?	Emilia Sousa	ICETA
ACTONP53 - Targeting p53 family proteins: on the route to new anticancer agents	Emilia Sousa	ICETA
JELLYFISHERIES - Towards na integradted approach to enhance predictive accuracy of jellyfish impact on coastal marine ecosystems	Agostinho Antunes	I. P. LEIRIA

Project	PI at CIIMAR	Leader Institution
MYTAG - Integrating natural and artificial tags to reconstruct fish migrations and ontogenetic niche shifts	Sandra Ramos	U. COIMBRA
PRE-NEURO-HD - Targeting huntingtin proteostasis and mitochondria to prevent neuronal dysfunction in Huntington's disease	Miguel Santos	ICETA
REEuse - Recovery versus environmental impacts of Rare Earth Elements derived from human activities	Carlos Vale	IPMA
PEIXEROL - Gycerol as na alternative ingredient for fish feed and its potential for aquaculture	Leonardo Magnoni	CNC- U. COIMBRA
NANOBINDERS - NANOpartículas polimétricas Biogenéticas funcionalizadas para absorção de metais em aplicações amigas do ambiente:bioREmediação e bioSensores	Ruth Pereira	U. AVEIRO
FERROCLEAN - Ferrofluidic Extensional Rheological Response for Ocean CLEAN	Laura Guimarães	FEUP
Biological producers of natural fluorinated compounds as a novel source of relevant degrading microorganisms and biosynthetic mechanisms	M ^a . Fátima Carvalho	CIIMAR
CARDIOFISH - Effects of dietary components and exercise on energy use and oxidative stress in the hearts of fish	Leonardo Magnoni	CIIMAR
Unravelling the functional importance of amino acids in the fish neuroendocrine-immune network	Benjamin Costas	CIIMAR
Causalities between diversity, ecosystem functions and services in marine ecosystems	Marina Dolbeth	CIIMAR

FUNDING



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EDITED SPECIAL ISSUES OF JOURNALS

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Taveira-Pinto, F., Rosa-Santos P., Ferradosa T. 2018. Special Issue: Progress on Marine Renewable Energy, Renewable Energy.

Urbatzka R., Vasconcelos V. 2018. Special issue: Marine Natural Products and Obesity, Marine Drugs.

Vasconcelos V., Leão P.N. 2018. Special Issue: Bioactive Compounds from Marine Microbes - II, Marine Drugs.

Completed PhD theses

Name: Alexandre Firmino Diógenes Thesis title: Potential of corn distillers dried grains with solubles (DDGS) in diets for turbot (*Scophthalmus maximus*) and gilthead seabream (*Sparus aurata*) Doctoral Programme/Doctoral Degree: Biology Faculty/University: FCUP, University of Porto Supervisor: Helena Peres Co-Supervisor: Aires Oliva Teles Date: July 2018

Name: Ana Vanessa Basto Regueiras

Thesis title: Symbiotic relationships between cyanobacteria and marine sponges: abundance, geographical distribution, phylogeny and chemdiversity

Doctoral Programme/Doctoral Degree: Biology Faculty/University: FCUP, University of Porto Supervisor: Vitor Vasconcelos Date: December 2018

Name: Caroline Medeiros Martins de Almeida Thesis title: Sequências didáticas eletrônicas com ferramentas metacognitivas no Ensino Superior do Brasil e de Portugal: construção e avaliação Doctoral Programme/Doctoral Degree: Teaching Sciences and

Mathematics Faculty/University: Lutheran University of Brazil, Brazil Supervisor: Paulo Tadeu Lopes Co-Supervisor: Maria João Santos Date: September 2018

Name: Chadaporn Prompanya Thesis title: Study of bioactive secondary metabolites from the marine sponges and marine sponge -associated fungi Doctoral Programme/Doctoral Degree: Biomedical Sciences Faculty/University: FCUP, University of Porto Supervisor: Anake Kijjoa Co-Supervisor: Madalena Pinto Date: September 2018

Name: Charinya Khamphukdee Thesis title: Neuropharmacological effects of alternanthera philoxeroides extract in menopausal-like models and its chemical constituents

Doctoral Programme/Doctoral Degree: Pharmaceutical and Development in Pharmaceuticals Faculty/University: Graduate School of Khon Kaen University, Thailand Co-Supervisor: Anake Kijjoa Date: January 2018

Name: Chiara Gabriele Santos Thesis title: Development of new tools for the identification of plants using chloroplast DNA sequences Doctoral Programme/Doctoral Degree: Biology Faculty/University: FCUP, University of Porto Supervisor: Filipe Pereira Co-Supervisor: Vitor Vasconcelos Date: May 2018

Name: Cidália Maria Teixeira Gomes Thesis title: Molecular and evolutionary genetics of invasive bivalves Doctoral Programme/Doctoral Degree: Biomedical Sciences Faculty/University: ICBAS, University of Porto Supervisor: Agostinho Antunes Co-Supervisor: Vítor Vasconcelos, Lúcia Guilhermino Date: May 2018

 Name: Elham Davarpanah
 Thesis title: Effects of microplastics, nanomaterials and other environmental contaminants on marine organisms
 Doctoral Programme/Doctoral Degree: Marine and Environmental Sciences
 Faculty/University: University of Porto, University of Aveiro, University of Algarve
 Supervisor: Lúcia Guilhermino
 Date: December 2018

Name: Eva Catarina Costa Amorim Thesis title: Integrated approach for the evaluation of fish nursery in a temperate estuary Doctoral Programme/Doctoral Degree: Biomedical Sciences Faculty/University: ICBAS, University of Porto Supervisor: Adriano A. Bordalo Co-Supervisor: Michael Elliot, Sandra Ramos Date: May 2018

Name: Glenise Bierhalz Voss Thesis title: Okara (by-product of soya beverage): Potential application in food and aquafeed Doctoral Programme/Doctoral Degree: Biotechnology Faculty/University: FCUP, University of Porto Supervisor: Manuela Pintado Co-Supervisor: Luísa Valente Date: September 2019

Name: Joana Cristina da Costa Lemos Thesis title: Using zebrafish as a biological model to study ionizing radiation effects Doctoral Programme/Doctoral Degree: Pathology and Molecular Genetics Faculty/University: ICBAS/FMUP, University of Porto Supervisor: António Paulo Carvalho Co-Supervisor: Luís Metello Date: July 2018

Name: Márcia Lima
Thesis title: Ferramenta numérica de análise do impacto de intervenções de defesa costeira na evolução da linha de costa: custos e benefícios
Doctoral Programme/Doctoral Degree: Civil Engineering
Faculty/University: University of Aveiro
Supervisor: Fernando Veloso Gomes
Co-Supervisor: Carlos Daniel Borges
Date: May 2018

Name: Maria João Dias Peixoto Thesis title: Seaweeds as functional aquafeed ingredients: Modulation of nutrient metabolism and stress responsiveness in aquaculture species Doctoral Programme/Doctoral Degree: Animal Sciences Faculty/University: ICBAS, University of Porto Supervisor: Rodrigo Ozório Co-Supervisor: José Fernando Gonçalves, Rui Pereira (Algaplus Lda.) Date: December 2018

Name: Patrícia Alexandra Correia Oliveira
 Thesis title: Effects of environmental contaminants on the exotic invasive bivalve *Corbicula fluminea* (Müller, 1774)
 Doctoral Programme/Doctoral Degree: Marine and Environmental Sciences
 Faculty/University: University of Porto, University of Aveiro, University

of Algarve Supervisor: Lúcia Guilhermino

Date: July 2018

Name: Paulo Neves Coelho

Thesis title: A Aplicação do Artigo 76º da Convenção das Nações Unidas sobre o Direito do Mar: os Poderes da Comissão de Limites da Plataforma Continental Doctoral Programme/Doctoral Degree: Law

Faculty/University: FDUP, University of Porto Supervisor: Marta Chantal Ribeiro Date: September 2018

Name: Pedro Miguel Macedo Geada

Thesis title: Development and optimization of cultivation systems and techniques in order to improve cyanotoxin productivity and cost effectiveness

Doctoral Programme/Doctoral Degree: Bioengineering MIT Portugal Faculty/University: University of Minho Supervisor: Bruno Fernandes Co-Supervisor: Vitor Vasconcelos Date: April 2018

Name: Sara Raquel Boaventura Rodrigues

Thesis title: Effects of antibiotics (erythromycin and oxytetracycline) in several biochemical, cellular and histological biomarkers of fish: a comparative study with two important aquaculture species, *Oncorhynchus mykiss* and *Sparus aurata* Doctoral Programme/Doctoral degree: Biology Faculty/University: FCUP, University of Porto Supervisor: Bruno Nunes Co-supervisor: Sara Antunes, Alberto Teodorico Correia Date: November 2018

Name: Sisandra Lurdes de Campos Pacheco e Ruela de Sousa Thesis title: Microscopic morphology of the liver of the guppy (*Poecilia reticulata*)

Doctoral Programme/Doctoral degree: Marine and Environmental Sciences

Faculty/University: University of Porto, University of Aveiro, University of Algarve

Supervisor: Eduardo Rocha Co-supervisor: Maria João Rocha Date: December 2018

Name: Tiago João Fazeres Ferradosa

Thesis title: Reliability analysis applied to the optimization of dynamic scour protections for offshore windfarm foundations Doctoral Programme/Doctoral degree: Civil Engineering Faculty/University: FEUP, University of Porto Supervisor: Francisco Taveira Pinto Date: September 2018

Name: Tiago Vinicius Zanella

Thesis title: A proteção do ambiente marinho e os limites à liberdade de navegação: contributo para a análise das restrições à navegação marítima internacional criadas para a proteção do meio marinho

Doctoral Programme/Doctoral degree: Law Faculty/University: University of Lisbon Supervisor: Fernando Loureiro Bastos Co-supervisor: Marta Chantal Ribeiro Date: November 2018

Name: War War May Zin Thesis title: Bioactive secondary metabolites from marine-derived fungi Doctoral Programme/Doctoral degree: Biomedical Sciences Faculty/University: ICBAS, University of Porto Supervisor: Anake Kijjoa Co-supervisor: Madalena Pinto Date: February 2018

Completed Master theses

Name: Adrián Delgado Ollero Thesis title: Benthic cyanobacteria biodiversity and potential toxicity from the northern hydrographic region of Portugal Master degree: Inland Water Quality Assessment Faculty/University: Facultad de Ciencias, Universidad Autonoma de Madrid, Spain Supervisor: Vitor Vasconcelos Co-supervisor: Vitor Ramos Date: September 2018

Name: Adriana Maria dos Santos Ferreira

Thesis title: Desenvolvimento de um algoritmo para a deteção automática de ondas internas no oceano para altímetros no modo SAR (Sentinel-3A) Master degree: Surveying Engineering Faculty/University: FCUP, University of Porto Supervisor: José Carlos da Silva Co-supervisor: Meric Srokosz Date: November 2018

Name: Agatha Gil

Thesis title: Cetáceos na Zona Económica Exclusiva Continental Portuguesa: distribuição espaço-temporal e registo de novas ocorrências Master degree: Ecology and Environment Faculty/University: FCUP, University of Porto Supervisor: Isabel Sousa Pinto Date: December 2018

Name: Alessandra Alves Muniz

Thesis title: Population structure of chub mackerel (*Scomber scolias*) in the northeast Atlantic inferred from natural tags Master degree: Environmental Sciences and Technology Faculty/University: FCUP, University of Porto Supervisor: Alberto Teodorico Correia Co-supervisor: Paulo José Talhadas dos Santos Date: December 2018

Name: Alexandra Gonçalves Meira

Thesis title: Predation of freshwater bivalves by invasive crayfishes Master degree: Ecology Faculty/University: University of Minho Supervisor: Ronaldo Sousa Co-supervisor: Francisco Arenas Date: 2018

Name: Ana Almeida Aguiar

Thesis title: Avaliação do estado ecológico da orla litoral no município de Ovar: o caso de estudo da monitorização de anfíbios da Barrinha de Esmoriz/Lagoa de Paramos e da caracterização da Interface Mar-Barrinha

Master degree: Biological Aquatic Resources Faculty/University: FCUP, University of Porto Supervisor: Natividade Vieira Co-supervisor: Paulo Silva Date: November 2018

Name: Ana Beatriz Teixeira Ribeiro Thesis title: Determination and risk evaluation of PAHs and PCBs in seawater samples collected at north and south of the Vila do Conde ornithological reserve Master degree: Marine Sciences - Marine Resources Faculty/University: FCUP, University of Porto Supervisor: Maria João Rocha Co-supervisor: Eduardo Rocha Date: December 2018

Name: Ana Cristina Rafael Joice Coutinho
Thesis title: Development and characterization of pH-sensitive
fucoidan-chitosan nanoparticles for oral delivery of methotrexate to
lung cancer cells
Master degree: Pharmaceutical Chemistry
Faculty/University: FFUP, University of Porto
Supervisor: Maria de La Salette Rodrigues
Co-supervisor: Carlos Afonso

Date: July 2018

Name: Ana Filipa Moreno Contente Costa Thesis title: Too warm for the sea urchin? The effect of temperature on the metabolism and fitness of the European purple seaurchin, *Paracentrotus lividus* Master degree: Marine Sciences - Marine Resources Faculty/University: ICBAS, University of Porto Supervisor: Francisco Arenas Co-supervisor: Vânia Freiras Date: December 2018

Name: Ana Luísa Fernandes Silva Thesis title: Estudo de seca na Península Ibérica usando o Google Earth Engine Master degree: Surveying Engineering Faculty/University: FCUP, University of Porto Supervisor: Nelson Ribeiro Pires Co-supervisor: Maria Joana Fernandes Date: December 2018

Name: Ana Margarida Rijo Vieira Fernandes
 Thesis title: The role of microplastics and bacteria in host-pathogen interactions
 Master degree: Environmental Contamination and Toxicology
 Faculty/University: ICBAS/FCUP, University of Porto
 Supervisor: Benjamin Costas
 Co-supervisor: Lúcia Guilhermino
 Date: December 2018

Name: Ana Margarida Subtil Campos
Thesis title: Azorean macroalgae (*Petalonia binghamiae, Halopteris scoparia* and *Osmundea pinnatifida*) bioprospection: A study of composition and bioactivity
Master degree:
Faculty/University: Faculty of Sciences, University of Lisbon Supervisor: Carlos Cardoso
Co-supervisor: Maria Teresa Rebelo
Date: October 2018

Name: Ana Sofia de Castro Lavrador Thesis title: Molecular tools for labelling and monitoring *Bacillus subtilis* probiotics in vivo Master degree: Biological Aquatic Resources Faculty/University: FCUP, University of Porto Supervisor: Claudia R. Serra Co-supervisor: Aires Oliva Teles, Ana Couto Date: December 2018

Name: Ana Sofia Ferreira de Almeida Ramos Thesis title: Exploiting the bioactive potential of microbial small molecules for the development of next generation antimicrobials Master degree: Biological Aquatic Resources Faculty/University: FCUP, University of Porto Supervisor: Claudia R. Serra Co-supervisor: Aires Oliva Teles Date: December 2018

Name: Ana Sofia Pereira de Brito **Thesis title:** Development of cultivation methods for *Ulva intestinalis* and *Laminaria ochroleuca*, native seaweed species with commercial value

Master degree: Biological Aquatic Resources Faculty/University: FCUP, University of Porto Supervisor: Isabel Sousa Pinto Co-supervisor: Isabel Azevedo, Tânia Pereira Date: December 2018

Name: Ana Visković
Thesis title: Evaluation of health status in European sea bass
(*Dicentrarchus labrax* L.) juveniles fed diets with partial replacement of fish meal by microalgae meal
Master degree: Mariculture
Faculty/University: Department of Aquaculture, University of Dubrovnik, Croatia
Supervisor: Ana Couto
Co-supervisor: Francisco Guardiola, Kruno Bonačić (UNIDU), Vlasta Bartulović (UNIDU)
Date: September 2018

Name: Anaísa Sofia Cordeiro Silva
Thesis title: Efeito do fotoperíodo e da temperatura no desenvolvimento embrionário e larvar de diferentes espécies marinhas: Argyrosomus regius, Diplodus sargus, Solea senegalensis e Sparus aurata
Master degree: Marine Sciences - Marine Resources
Faculty/University: ICBAS, University of Porto
Supervisor: Pedro Pousão Ferreira
Co-supervisor: José Fernando Gonçalves
Date: December 2018

Name: André Couto Cardoso Thesis title: Grazing preferences on native and non-native macroalgae Master degree: Biological Aquatic Resources Faculty/University: FCUP, University of Porto Supervisor: Francisco Arenas Co-supervisor: João Franco, Isabel Sousa Pinto Date: November 2018

Name: Bárbara Marlene Pinheiro Thesis title: Ecotoxicology of Deep-sea Environments Master degree: Environmental Contamination and Toxicology Faculty/University: ICBAS/FCUP, University of Porto Supervisor: Miguel Santos Co-supervisor: Luís Filipe Castro Date: October 2018 Name: Carlos Diogo Morais da Costa Thesis title: Evaluation of the Soil Quality of the Douro Vineyard region: the effect of different modes of production Master degree: Ecology and Environment Faculty/University: FCUP, University of Porto Supervisor: Anabela Cachada Co-supervisor: Ruth Pereira Date: December 2018

Name: Carolina Cristina Guimarães da Costa
 Thesis title: Medical-veterinary intervention in zoological parks and in the clinical approach of new companion animals
 Master degree: Veterinary Medicine
 Faculty/University: University of Trás-os-Montes and Alto Douro (UTAD)
 Supervisor: José Manuel Almeida
 Date: December 2018

Name: Célio Dinarte Sousa Neves Thesis title: Search for new antimicrobial agents: from old pharmaceuticals to new synthetic compounds Master degree: Pharmaceutical Chemistry Faculty/University: FFUP, University of Porto Supervisor: Maria Eugénia Pinto Co-supervisor: Honorina Cidade Date: November 2018

Name: Celso Eduardo Dias Cardoso Thesis title: Recovery of rare earths from natural waters using carbon-based nanomaterials Master degree: Chemistry Faculty/University: University of Aveiro Supervisor: Cláudia Batista Lopes Co-supervisor: Maria Eduarda Pereira, Tito Trindade Date: July 2018

Name: Cláudia Isabel Nunes Coutinho Thesis title: Manutenção e reprodução em peixe zebra (*Danio rerio*) Master degree: Marine Sciences - Marine Resources Faculty/University: ICBAS, University of Porto Supervisor: Hugo Santos Co-supervisor: Luísa Valente Date: December 2018

Name: Cristiana Gonçalves da Costa Santos Thesis title: Enantioselective studies of biodegradation and ecotoxicity of tramadol and its metabolites. Master degree: Environmental Contamination and Toxicology Faculty/University: ICBAS/FCUP, University of Porto Supervisor: Maria Elizabeth Tiritan Co-supervisor: Lúcia Guilhermino, Cláudia Ribeiro Date: November 2018

Name: Diana Maria da Rocha Lopes Rego
Thesis title: Clinic and management of wild animals in zoos and recovery centers and their role in wildlife conservation
Master degree: Veterinary Medicine
Faculty/University: University of Trás-os-Montes and Alto Douro (UTAD)
Supervisor: José Manuel Almeida
Date: October 2018

Name: Diana Santiago dos Santos Thesis title: Characterization of brown trout fitness and gonadal maturation along the reproductive cycle Master degree: Marine Sciences - Marine Resources Faculty/University: ICBAS, University of Porto Supervisor: Tânia Vieira Madureira **Co-supervisor:** Eduardo Rocha **Date:** December 2018

Name: Diogo Filipe Carneiro Coelho

Thesis title: Cianobactérias e microalgas autóctones como potenciadoras de crescimento e melhoradoras da estruturas do solo Master degree: Functional Biology and Biotechnology of Plants Faculty/University: FCUP, University of Porto Supervisor: Paula Gomes Co-supervisor: Paula Tamagnini, Ruth Pereira Date: December 2018

Name: Diogo Vilela Pinto Moreira Thesis title: Contributos para o Plano Estratégico de Gestão de Ativos de um Sistema Multimunicipal de Abastecimento de Água Master degree: Civil Engineering Faculty/University: FEUP, University of Porto Supervisor: Fernando Veloso Gomes Date: February 2018

Name: Fernando António Pereira Gonçalves Thesis title: Aquacultura em Portugal - Principais fatores que contribuíram para a sua estagnação e perspetivas futuras Master degree: Marine Sciences - Marine Resources Faculty/University: ICBAS, University of Porto Supervisor: José Fernando Gonçalves Date: December 2018

Name: Filipe José Martins Rocha
 Thesis title: Recovery of platinum-group elements using graphene nanocomposite
 Master degree: Chemical Engineering
 Faculty/University: University of Aveiro
 Supervisor: Cláudia Batista Lopes
 Date: 2018

Name: Gisela Gonçalves Canelas Thesis title: Efeitos da exposição cronica à diclofenac ao longo de uma cadeia trófica simulada em ambiente marinho. Mestrado Integrado em Ciências Farmacêuticas Master degree: Pharmaceutical Sciences Faculty/University: University Fernando Pessoa Supervisor: Alberto Teodorico Correia Date: December 2018

Name: Gonçalo Miguel Sousa Coelho Thesis title: Otimização do Conversor de Energia das Ondas CECO Master degree: Civil Engineering Faculty/University: FEUP, University of Porto Supervisor: Paulo Jorge Rosa Santos Co-supervisor: Francisco Taveira Pinto Date: October 2018

Name: Inês Alexandra Martins de Sá
Thesis title: Fishmeal substitution for microalgae in diets for European sea bass (*Dicentrarchus labrax*) juveniles: effect on growth and feed utilization
Master degree: Biological Aquatic Resources
Faculty/University: FCUP, University of Porto
Supervisor: Helena Peres
Co-supervisor: Ana Couto
Date: November 2018

Name: Inês Sofia Madeira Duarte Thesis title: A importância da avifauna selvagem na perspetiva one health Master degree: Veterinary Medicine Faculty/University: University of Trás-os-Montes and Alto Douro (UTAD) Supervisor: Paulo Martins da Costa Date: July 2018

Name: Janaina Morone Bavini Thesis title: Cyanobacteria in skin protection Master degree: Biology and Management of Water Quality Faculty/University: FCUP, University of Porto Supervisor: Rosário Martins Co-supervisor: Vitor Vasconcelos Date: November 2018

Name: Joana Santos Silva Thesis title: Assessment of the edaphic community in an *Eucalyptus* globulus Labill. allotment at Santa Justa's mountain Master degree: Ecology and Environment Faculty/University: FCUP, University of Porto Supervisor: Rubim Almeida Co-supervisor: Sara Antunes Date: December 2018

Name: João Filipe Guimarães Pinto Thesis title: Zooplankton dynamics and water quality of the reservoirs from the Alqueva Irrigation System Master degree: Ecology and Environment Faculty/University: FCUP, University of Porto Supervisor: Sara Antunes Co-supervisor: Filipe Banha Date: November 2018

Name: João Manuel da Silva Mendes Thesis title: Estudo laboratorial do comportamento da cabeça de um esporão recorrendo a dois tipos de blocos artificiais. caso de estudo: Espinho

Master degree: Civil Engineering Faculty/University: FEUP, University of Porto Supervisor: Fernando Veloso Civil Date: October 2018

Name: João Paulo Moreira da Silva Thesis title: Diversity and toxicity and biotechnological potential of subaerial cyanobacteria Master degree: Biology and Management of Water Quality Faculty/University: FCUP, University of Porto Supervisor: Vitor Ramos Co-supervisor: Vitor Vasconcelos Date: December 2018

Name: João Pedro Ribeiro dos Santos Thesis title: Use of environmental bacteria as plant growth promoters Master degree: Functional Biology and Biotechnology of Plants Faculty/University: FCUP, University of Porto Supervisor: Olga Maria Lage Co-supervisor: Date: October 2018

Name: João Pedro Soares Pereira do Carmo Thesis title: Enantioresolution, chiral recognition mechanisms and binding of xanthone derivatives on immobilized human serum albumin by liquid chromatography Master degree: Pharmaceutical Chemistry Faculty/University: FFUP, University of Porto Supervisor: Carla Fernandes Co-supervisor: Carlos Afonso Date: November 2018

Name: José Carlos Moreira Borges Thesis title: Criação de bases de dados cadastrais e estudo de transformação de coordenadas do concelho de Matosinhos Master degree: Surveying Engineering Faculty/University: FCUP, University of Porto Supervisor: Clara Lázaro Co-supervisor: Elsa Severino Date: July 2018

Name: José Miguel Reis de Brito e Castro Thesis title: Transportes Marítimos Internacionais e Implicações nas Infraestruturas Portuárias Master degree: Civil Engineering Faculty/University: FEUP, University of Porto Supervisor: Fernando Veloso Civil Date: July 2018

Name: Laura Almeida Felício
Thesis title: Study of suspected cases of anticoagulant rodenticides intoxication in dogs.
Master degree: Veterinary Medicine
Faculty/University: University of Trás-os-Montes and Alto Douro (UTAD)
Supervisor: José Manuel Almeida
Co-supervisor: Justina Oliveira
Date: June 2018

Name: Leonor do Amaral Silva Ferreira Thesis title: Bioactivity screening of cyanobacteria for the isolation of novel anticancer compounds using 2D and 3D cell culture models Master degree: Environmental Contamination and Toxicology Faculty/University: ICBAS/FCUP, University of Porto Supervisor: Ralph Urbatzka Co-supervisor: Vitor Vasconcelos Date: November 2018

Name: Luís Ferreira Sousa Thesis title: Antibiotic effect of manuka honey on *Staphylococcus pseudintermedius* biofilms Master degree: Veterinary Medicine Faculty/University: University of Trás-os-Montes and Alto Douro (UTAD) Supervisor: Paulo Martins da Costa Date: July 2018

Name: Luís Miguel Forte de Faria Pinto da Silva Thesis title: Avaliação da qualidade microbiológica de águas da bacia hidrográfica do Rio Minho Master degree: Biology and Management of Water Quality Faculty/University: FCUP, University of Porto Supervisor: Natividade Vieira Date: November 2018

Name: Luís Tiago Ferreira Fernandes Thesis title: Modelação Numérica do Desempenho Hidráulico do Bloco de Proteção Costeira SWED-Block Master degree: Civil Engineering Faculty/University: FEUP, University of Porto Supervisor: Francisco Taveira Pinto Co-supervisor: Paulo Jorge Rosa Santos Date: September 2018

Name: Marco António Alves Amaral Thesis title: Reprodução e cultura de ostra plana (*Ostrea edulis*) em Portugal Master degree: Biological Aquatic Resources Faculty/University: FCUP, University of Porto Supervisor: Sara Antunes Co-supervisor: António Correia Date: October 2018 Name: Maria del Pilar Escribano Rodriguez
Thesis title: Mucosal immune response in skin mucus from ocular and blind sides of Senegalese sole (*Solea senegalensis* Kaup) after bacterial challenge
Master degree: Marine Sciences - Marine Resources
Faculty/University: FCUP, University of Porto
Supervisor: Benjamin Costas Refojos
Date: October 2018

Name: Maria Luis de Vilar Correia Brito Bôto Thesis title: Development of a georeferenced library of native microbial consortia for bioremediation of oil spills Master degree: Biodiversity, Genetics and Evolution Faculty/University: FCUP, University of Porto Supervisor: Ana Paula Mucha Co-supervisor: Catarina Magalhães Date: November 2018

Name: Mariana Girão Silva Martins Thesis title: Endophytic Actinobacteria from *Laminaria ochroleuca*: a new source of bioactive compounds Master degree: Cell and Molecular Biology Faculty/University: FCUP, University of Porto Supervisor: Fátima Carvalho Co-supervisor: Pedro Leão Date: November 2018

Name: Mariana Peneda Paiva Cubal de Almeida Thesis title: Produtos de Confeitaria: Investigação e Desenvolvimento Master degree: Veterinary Medicine Faculty/University: University of Trás-os-Montes and Alto Douro (UTAD) Supervisor: Paulo Martins da Costa Date: March 2018

Name: Mariana Pereira dos Santos Thesis title: A congelação de peixe na produção de conservas: avaliação físico-químicas na Fábrica de Conservas Ramirez Master degree: Food Science and Technology Faculty/University: FCUP, University of Porto Supervisor: Paulo Vaz-Pires Co-supervisor: Victor Freitas, Margarida Lopes (Ramirez) Date: November 2018

Name: Mariana Silva Gonçalves Thesis title: Cultivation of *Codium tomentosum* and *Osmundea pinnatifida*, native seaweed species with commercial potential Master degree: Biological Aquatic Resources Faculty/University: FCUP, University of Porto Supervisor: Isabel Sousa Pinto Co-supervisor: Isabel Azevedo, Tânia Pereira Date: December 2018

Name: Marta Filipa Peniche da Costa Thesis title: Efeitos de concentrações ambientalmente relevantes de omeprazol em *Sparus aurata*: abordagem baseada em biomarcadores Master degree: Pharmaceutical Sciences Faculty/University: University Fernando Pessoa Supervisor: Alberto Teodorico Correia Date: December 2018

Name: Natália Gonçalves da Silva Thesis title: Bioactivity screening of marine cyanobacteria for the isolation of novel compounds for obesity related co-morbidities Master degree: Environmental Contamination and Toxicology Faculty/University: ICBAS/FCUP, University of Porto Supervisor: Ralph Urbatzka **Co-supervisor:** Mariana Reis, Vitor Vasconcelos **Date:** November 2018

Name: Nelly Brugerolle de Fraissinette Thesis title: Bioassay-guided discovery of antifouling compounds from cyanobacteria Master degree: Applied Blue Biotechnology Faculty/University: University of La Rochelle Supervisor: Pedro Leão Date: June 2018

Name: Nuno António Rocha e Sousa Thesis title: Dynamics of zooplankton communities in Alqueva reservoir Master degree: Ecology and Environment Faculty/University: FCUP, University of Porto Supervisor: Sara Antunes Co-supervisor: Ana Mafalda Gama Date: November 2018

Name: Paulo Alexandre da Costa Rainha Thesis title: Produção de Espécies Endémicas da Costa Norte Portuguesa em Aquacultura Multitrófica Integrada (IMTA) Master degree: Biological Aquatic Resources Faculty/University: FCUP, University of Porto Supervisor: Helena Peres Co-supervisor: Tânia Pereira Date: December 2018

Name: Pedro Oliveira Braga Moreira Biscaia Thesis title: Estudo de um Sistema Fotovoltaico Flutuante na Albufeira do Alto Rabagão Master degree: Civil Engineering Faculty/University: FEUP, University of Porto Supervisor: Paulo Jorge Rosa Santos Co-supervisor: Francisco Taveira Pinto Date: March 2018

Name: Pedro Rafael Martins Vaz Thesis title: Development of a rotifer enrichment protocol to feed zebra fish larvae (*Danio rerio*) using microalgae Master degree: Biological Aquatic Resources Faculty/University: FCUP, University of Porto Supervisor: Ana Couto Co-supervisor: Aires Oliva Teles, Filipe Coutinho Date: December 2018

Name: Pedro Sousa Cruz Thesis title: Toxicity of mixtures of cyanobacteria and microplastics in aquatic organisms. Master degree: Environmental Contamination and Toxicology Faculty/University: ICBAS/FCUP, University of Porto Supervisor: Vitor Vasconcelos Co-supervisor: Lúcia Guilhermino Date: December 2018

Name: Ricardo Jorge Jesus Costa Garcia Thesis title: Influence of urbanization in an intertidal ecosystem engineer: *Chthamalus* barnacles and their associated epifauna Master degree: Marine Sciences - Marine Resources Faculty/University: FCUP, University of Porto Supervisor: Purificación Veiga Sánchez Co-supervisor: Maria João Rocha Date: December 2018

Name: Ricardo Nuno Costa Luís Thesis title: Avaliação dos métodos de indução de desova e desenvolvimento larvar do ouriço-do-mar comum, *Paracentrotus* lividus (Lamarck, 1816) Master degree: Aquaculture Faculty/University: Superior School of Tourism and Technology of the Sea, Polithecnical Institute of Leiria Supervisor: Sílvia Lourenço Co-supervisor: Ana Margarida Pombo Date: November 2018

Name: Rinke Corinne Michelle de Groot
Thesis title: Removal of As and Hg from groundwater using the magnetic graphene-based nanocomposites
Master degree:
Faculty/University: University of Utrecht
Co-supervisor: Cláudia Batista Lopes
Date: 2018

Name: Rita Maria Nunes de Figueiredo Thesis title: Isolamento e caraterização de estirpes de cianobactérias relevantes do ponto de vista biotecnológico e ambiental Master degree: Biology and Management of Water Quality Faculty/University: FCUP, University of Porto Supervisor: Vitor Ramos Co-supervisor: Vitor Vasconcelos Date: December 2018

Name: Rosa Fernanda da Silva Melo Thesis title: Avaliação da comunidade de macroalgas da praia rochosa de Belinho-Mar Master degree: Ecology and Environment Faculty/University: FCUP, University of Porto Supervisor: Carla Borges Co-supervisor: Sara Antunes Date: July 2018

Name: Sabrina Rodrigues Magalhães Thesis title: Ratio between fish larvae and microplastics in the Douro estuary: temporal and spatial dynamics Master degree: Marine Sciences - Marine Resources Faculty/University: ICBAS, University of Porto Supervisor: Sandra Ramos Date: December 2018

Name: Sandra Cruz Vicente Thesis title: Investigation of the microbial community associated with the fluoracetate-producing plant *Dichapetalum cymosum* and of the presence of fluorinase gene in its microbiome Master degree: Forensic Genetics Faculty/University: FCUP, University of Porto Supervisor: Maria de Fátima Carvalho Co-supervisor: Fernando Tavares, Filipe Pereira Date: November 2018

Name: Sandra Isabel Madureira Nogueira Thesis title: Avaliação da qualidade da água na Albufeira do Torrão: dinâmica do zooplâncton como bioindicador Master degree: Ecology and Environment Faculty/University: FCUP, University of Porto Supervisor: Sara Antunes Date: November 2018

Name: Sara Catarina Moreira Nogueira Thesis title: Kudoa Meglitsch, 1947 (Cnidaria: Myxozoa) in Tunas from Madeira Archipelago and in *Micromesistius poutassou* from Northeast Atlantic

Master degree: Biological Aquatic Resources Faculty/University:FCUP, University of Porto Supervisor: Aurélia Saraiva Date: July 2018 Name: Sara Raquel Ferreira Araújo Thesis title: Degradação de oxitetraciclina por processos oxidativos avançados solares utilizando reatores inovadores e respetiva análise ecotoxicológica

Master degree: Environmental Engineering Faculty/University: FEUP, University of Porto Supervisor: Raquel Oliveira Cristóvão Co-supervisor: Vítor Vilar, Maria Teresa Neuparth Date: July 2018

Name: Sofia Graça Aranha Carvalho Ramos Thesis title: Diet and trophic position of deep-sea sharks in the South-West Coast of Portugal using stable isotopes analysis and nucleic acids ratios (RNA/DNA) Master degree: Marine and Coastal Systems Faculty/University: University of Algarve Co-supervisor: Ester Dias Date: December 2018

Name: Sofia Maria Filipe Amaral Thesis title: Establishment of a feeding protocol to improve survival and growth of whiteleg shrimp (*Penaeus vannamei*) at RiaSearch Master degree: Biological Aquatic Resources Faculty/University: FCUP, University of Porto Supervisor: Helena Peres Co-supervisor: Aires Oliva-Teles, Renata Serradeiro Date: November 2018

Name: Sofia Martins Dias
Thesis title: Phytoremediation of pharmaceuticals by estuarine salt marsh plants
Master degree: Environmental Engineering
Faculty/University: FEUP, University of Porto
Supervisor: Marisa Almeida
Co-supervisor: Carlos Rocha Gomes
Date: July 2018

Name: Tiago Miguel de Sousa Foz Thesis title: Estágio na Aquacultura Safiestela Master degree: Biological Aquatic Resources Faculty/University: FCUP, University of Porto Supervisor: Helena Peres Co-supervisor: Aires Oliva-Teles Date: December 2018

Name: Tomás Barreira Calheiros Barbosa Cabral
Thesis title: Avaliação do desempenho de um sistema híbrido de aproveitamento da energia das ondas para o quebramar norte do Porto de Leixões
Master degree: Civil Engineering
Faculty/University: FEUP, University of Porto
Supervisor: Francisco Taveira Pinto
Co-supervisor: Paulo Jorge Rosa Santos, Hugo Guedes Lopes
Date: July 2018

Name: Vanessa Alexandra Teixeira de Sá Queirós Thesis title: Feeding inhibition tests as a tool for seston quality evaluation in lentic ecosystems: salinization impact Master degree: Ecology and Environment Faculty/University: FCUP, University of Porto Supervisor: Sara Antunes Date: July 2018

Name: Vânia Gonçalves Carvalhido Thesis title: Development of an Ecotoxicological Test with Soil Microalgae Species Master degree: Biology and Management of Water Quality Faculty/University: FCUP, University of Porto Supervisor: Ruth Pereira Co-supervisor: Paula Gomes Date: November 2018

OTHER SCIENTIFIC OUTPUTS

Patents

Inventors: Ozório, R., Souza, A. T, Pereira, L., Gonçalves, J.F., Fernandes, M. 2018. International Patent Application PCT/IB2018/052595 - Autonomous aquaculture fish feeding system and operation method thereof. Applicants: CIIMAR - Centro Interdisciplinar de Investigação Marinha e Ambiental, Universidade do Porto, Foodintech, Lda.

Inventors: Valente, L. M. P., Pintado, M., Batista, S., Futuro, A., Faria, J. 2018. Provisional Patent Application PT 110611 - Method for obtaining proteins or a rich-protein extract from algae, extracts and uses therefore. Applicants: CIIMAR - Centro Interdisciplinar de Investigação Marinha e Ambiental, Universidade do Porto, Universidade Católica Portuguesa - UCP, New Enzymes, Lda.

Inventors: Serra, C., Enes, P., Oliva-Teles, A., Tavares, F. 2018. Provisional Patent Application PT 115101 - Sporeforming probiotic strains, methods and uses thereof. Applicants: CIIMAR - Centro Interdisciplinar de Investigação Marinha e Ambiental, Universidade do Porto.

Inventors: Gaudêncio, S., Almeida, R., Pereira, M.F., Sanches, I., Gonçalves, S., Cunha, I., Almeida, J.R., Vasconcelos, V. 2018. Provisional Patent Application PT 115055 - Utilização de napiradiomicinas com actividade anti-incrustante e composições da mesma. Applicants: CIIMAR - Centro Interdisciplinar de Investigação Marinha e Ambiental, Universidade do Porto, Universidade Nova de Lisboa, Instituto Politécnico de Setúbal.

Inventors: Magalhães, C., Ribeiro, H., Dias, A., Almeida, M., Tomasino, M.P., Guedes, M., Ramos, S., Dias, N., Mucha, A. P., Carvalho, F., Martins, A., Gonçalves, M., Silva, E., Almeida, J. 2018. Provisional Patent Application PT 115183 - Device for capturing in situ aquatic microbiomes. Applicants: CIIMAR - Centro Interdisciplinar de Investigação Marinha e Ambiental, Universidade do Porto, INESC TEC - Instituto de Engenharia de Sistemas e Computadores, Tecnologia e Ciência, Instituto Superior de Engenharia Do Porto.

Inventors: Correia-da-Silva, M., Pinto, M., Sousa, E., Vasconcelos, V., Almeida, J.R., Geraldes, E. 2018. Provisional Patent Application PT 115214 - Xanthonic Compounds and their use as antifouling agents. Applicants: CIIMAR - Centro Interdisciplinar de Investigação Marinha e Ambiental, Universidade do Porto.

Inventors: Martins, T., Reis, M., Leão, P., Vasconcelos, V., Ramos, V., Hassouani, M., Sabour, B. 2018. Provisional Patent Application PT 115227 - Ultra-violet absorbing compounds. Applicants: CIIMAR - Centro Interdisciplinar de Investigação Marinha e Ambiental, Universidade do Porto, Chouaib Doukkali University.

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

 $\mathsf{Prototype}\,-\,\mathsf{GeniuSampler}$: an autonomous biosampler to capture in situ aquatic microbiomes.

Iglesias, I., Avilez-Valente, P., Bio, A., Bastos, L.: 2D-Horizontal hydrodynamical numerical model of the Douro estuary region based on the Open-TELEMAC MASCARET modelling system.

Iglesias, I., Avilez-Valente, P., Gonçalves, J.A., Bio, A., Bastos, L.: 2D-Horizontal hydrodynamical numerical model of the Minho estuary region based on the Open-TELEMAC MASCARET modelling system.

Lopes, C.L., Caetano, M., Santos, M.M., Iglesias, I., Bastos, L.: 3D hydrodynamical numerical model + lagrangian tool for the Azores region based on the ROMS and ICHTHYOP models.

Pires, N.: Development, implementation and validation of sea state bias estimations based on new algorithms and models for global multimission satellite altimeter data.

Santos Ferreira, A. M., da Silva, J.C.B.: Computer code (Matlab) for automatic detection of high-frequency events in synthetic aperture radar (SAR) Altimetry for Sentinel-A and B missions. The algorithm is based on wavelets and on the computation of the mean square slope of ocean wind waves.

Fernandes, M.J., Lázaro, C., Pires, N., Vieira, T.: GPD+ WTC for Satellite Radar Altimetry Missions: products available at https://www.fc.up.pt/ Satellite_Altimetry/index.html

Pinto, J., Mendes, R.: A java script code was developed to run onboard of an autonomous underwater vehicle (AUV) to autonomously detect, track and survey coastal fronts (i.e. Douro River Plume).

Santos, C., Carneiro, J., Pereira, F.: PlantAligDB: A database of curated nucleotide sequence alignments for plants (http://plantaligdb. portugene.com/cgi-bin/PlantAligDB_home.cgi)



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