Marie Skłodowska-Curie Actions 2020

Call for Expressions of Interest

CSIC | Consejo Superior de Investigaciones Científicas
iim | INSTITUTO DE INVESTIGACIÓNS MARIÑAS

The Institute of Marine Research (IIM-CSIC) wishes to attract excellent researchers at the post-doctoral level to apply to the prestigious European Commission's programme Marie Skłodowska-Curie Actions – European Individual Fellowship (MSCA-IF).

Why the IIM?

The Institute of Marine Research (IIM) belongs to the Spanish National Research Council (CSIC), the main research organization in Spain, the third in Europe and the seventh in the world.

The IIM-CSIC is one of the top marine research institutes in Spain, with a very intense research activity and its own transversal support services of Internationalization and Public Engagement. The Institute offers a lively research environment to foster and consolidate researchers' careers, widening their collaborative networks & increasing their impact on society.

CSIC | A framework for excellent research

120 Institutes
(6 in Marine Science)

4 Research Vessels
1 Antartic Base

> 200 MSCA grants
in 2019

IIM IN NUMBERS | Year 2019

87 Research Projects
>12M€ Funds
(57% International)

> 30 R&D Contracts
with Industry

148 Research Articles
> 200 Scientific Communications
>100 Outreach Activities

> 200 Researchers +
Support Staff

The research you want, with a global perspective

OCEAN AND COASTAL SYSTEMS
- CO2 and acidification
- Ocean currents
- Nutrient cycles
- Phytoplancton and pigments
- Metals and rare earth elements

MARINE LIFE AND ECOSYSTEMS
- Sustainable fishing
- Sustainable aquaculture
- New aquaculture species
- Vulnerable species
- Fish and shellfish diseases

BIOLOGICAL PROCESSES AND SYSTEMS
- Food safety
- Quailty and traceability
- Bioactive compounds
- Bioprocess engineering
- Systems biology

…TO FOLLOW OUR GOALS

The IIM-CSIC is a multidisciplinary research centre which aims to contribute to the UN Sustainable Development Goals through its different research lines which structure our work, responding to global challenges and to local concerns:

1. **Oceans and Climate** to predict climate change and develop actions to combat or mitigate its impacts.

2. **Marine biodiversity** and conservation to sustainably use the oceans, seas and marine resources

3. **Food, bioproducts and health** to achieve food security, improved nutrition, healthy lives and well-being.

These scientific goals contribute to other transversal goals of the IIM related to the talent development, knowledge and technology transfer, as well as engagement with society for sustainable development and ethical values.
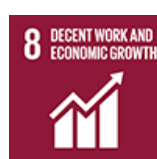
Application & support

If you are interested in applying with us, check the project outlines below and contact the project supervisor directly. Alternatively, or if you need more information, you may contact us at lpeteiro@iim.csic.es

We will offer support to applicants during the preparation of the proposal, as well as expert revision of applications before submission.

Eleven projects to boost your career

OCEAN ACIDIFICATION

Supervisor: Fiz Pérez | Oceanology

Our research group has a long experience researching the impact of the anthropogenic CO2 in the marine carbon cycles and ocean acidification, using both, in situ observations and laboratory experiments. We want to continue advancing on the understanding and prediction of the impacts of climate change over marine biota, by interpretation and modelling of data from water mass characterization, as well as CO2 controlled-conditions experiments developed in our installations.

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GENETICS OF PIGMENT PATTERN FORMATION IN FISHES. EVOLUTION OF COUNTER-SHADING MECHANISMS

Supervisor: Josep Rotllant | Fish Functional Genomics

How does animal colouration come about? What processes control the distribution of pigments or pigmented cells in reproducible ways? How is the diversity of coloured fish in a tropical reef generated? This is the problem of pigment pattern formation. Pigment pattern formation is a classic problem in biology, with wide implications both at a basic biological level and an applied level. In our project, we aim to understand the genetic and cellular bases for pigment pattern formation. We use zebrafish and turbot as animal models.

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LAND-SEA EXCHANGE OF RARE EARTH ELEMENTS

Supervisor: Ricardo Prego | Marine Biogeochemistry

Rare earth elements (REEs) constitute a set of 17 elements widely used in our technological society. However, the environmental consequences of the anthropogenic increase of RREs in coastal systems are poorly understood. Our research group is interested on how anthropogenic inputs alter REEs concentration in the environment, and what are the consequences for their biochemical cycles and exchange processes, particularly at the land-sea interface.

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STOCHASTIC CONTROL OF BACTERIAL POPULATIONS

Supervisor: Antonio A. Alonso | Process Engineering

Biochemical noise determines cell fate but precludes the control of population states. Only recently, the control of individual cells in cell population has been undertaken, although with partial success, due to noise during proliferation. We consider the problem of on-line control and stabilization of single cell phenotypes on a bacterial population. To that purpose, we plan to develop a novel control paradigm to guide the modulation of the underlying stochastic gene circuits that regulate metabolic activity, through the available environmental stress variables.

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OPTIMALITY PRINCIPLES IN COMPUTATIONAL SYSTEMS AND SYNTHETIC BIOLOGY

Supervisor: Julio R. Banga | ⊕ [Process Engineering](#)

In biological systems, optimality principles can be justified from an evolutionary perspective. In the context of computational systems biology, we will develop methods based on these principles to explain the behaviour of complex biomolecular networks. Further, we will also extend this approach to design and control new biocircuits in the context of computational synthetic biology.

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SOCIAL CONNECTIVITY OF COASTAL SPECIES AND THEIR ROLE IN CONSERVATION

Supervisor: Alexandre Alonso Fernández | [Fisheries Ecology](#)

A project proposal is offered to investigate how the interaction between natural and anthropogenic factors affect the social connectivity of coastal populations and their impact on conservation. We use in this project the data recorded by a net of acoustic receivers displayed within a marine protected area. This project aims at taking advantage of current projects developed by the research group in the field of spatial ecology and behaviour of marine animals.

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DEVELOPMENT OF ARTIFICIAL INTELLIGENCE (AI) TECHNIQUES APPLIED TO FISHERIES ECOLOGY AND MANAGEMENT

Supervisor: Luís Taboada| [Process Engineering](#)

The overall objective of the project is to improve the reliability, robustness and speed of automatic classification and quantification of fish species tools both on-board fishing vessels as well as wild in their environment developed by IIM-CSIC research groups towards the definition of an efficient and useful platform for integration and exchange of information and expert knowledge in the field of artificial intelligence applied to fisheries ecology and management. This objective is addressed through a synergy between interdisciplinary IIM-CSIC teams that have worked on several LIFE and Pleamar Programme projects on this topic.

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ANTIVIRAL AND INFLAMMATORY RESPONSE USING ZEBRAFISH AS A MODEL

Supervisor: Beatriz Novoa | [Immunology & Genomics](#)

Our research group uses the zebrafish model to study the molecular basis of the response against virus and also inflammation. We are interested on the study of genes involved in the inflammatory response of particular human diseases and in the development of molecular techniques to block and over-express specific genes using the model of zebrafish larvae.

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GENOMICS AND EFFECT AGAINST INFECTION OF MARINE DEFENCE PEPTIDES

Supervisor: Antonio Figueras| Immunology & Genomics

Our research group is specialized in genomics, transcriptomics, immunology and bioinformatics. We are interested in understanding the genetic variability (transcriptomic and functional) of antimicrobial and bioactive genes from the mussel genome (recently published for our research group) with high biotechnological potential because of their activity against pathogens of mollusks, fish and also humans. We will also study the relationship between the variability observed and the individual microbiomes.

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MULTI-SCALE DYNAMIC MODELLING OF MICROBIAL MIXED CULTURES

Supervisor: Eva Balsa-Canto| Process Engineering

Mixed microbial cultures have enormous potential to perform metabolically complex tasks for industrial biotechnology. Their design requires defining the species to be combined, their relative starting abundances and the environmental conditions. Answering these questions is a challenging task which entails integrating various omics data into models.

We aim at developing computational methods and multi-scale dynamic models to shed light on interspecies interactions and the environmental factors leading to the emergence of cooperation. These models will play a critical role in the rational design and optimal control of novel bioprocesses..

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MICROBIAL INTERACTIONS IN MACROALGAE WITH IMPLICATIONS IN AQUACULTURE

Supervisor: José Pintado| Fish Larval Biology & Physiology

Bacterial communities associated with Ulva spp. play an important functional role both in morphogenesis and reproduction, considering Ulva and its associated microbiota a singular functional entity or holobiont. Moreover, Ulva spp. host antibiotic-producing bacteria (APB, e.g. Phaeobacter sp.) with known antagonism against fish pathogens.

Using a multi-disciplinary approach, including -omic techniques, the research will contribute to the understanding of the role those APB, and the conditions that favour their predominance in Ulva spp., which would have implications in disease control in fish-algae IMTA-RAS systems.

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