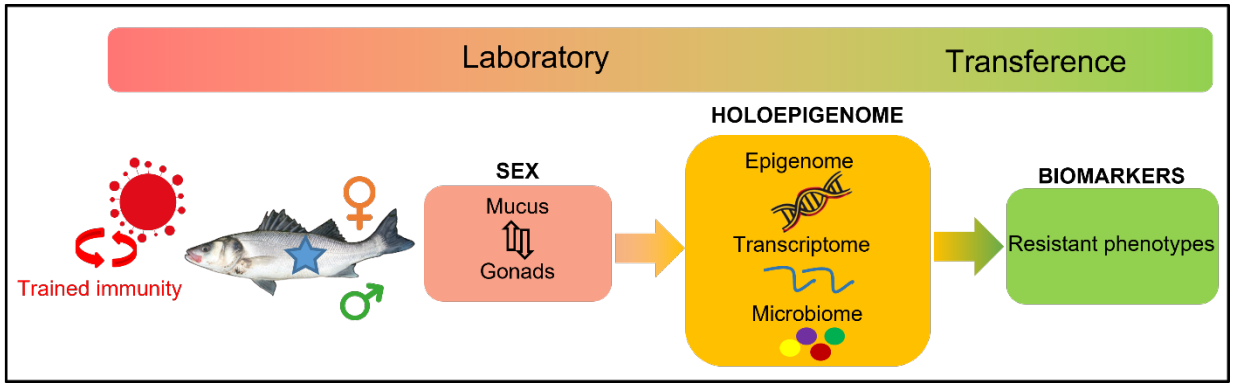
August 2024

The Institute of Marine Sciences (ICM-CSIC) seeks an outstanding PhD student for the project HOLOSEX

Project Description

In vertebrates, sex is an essential determinant of the immune response: females and males have different susceptibilities to diseases where epigenetic mechanisms play a relevant role. Nevertheless, very little is known about the epigenetic responses related to sex and the immune system in fish.



HOLOSEX aims to enhance our understanding of **sex-dependent epigenetic mechanisms** resulting from successive infections and **identify biomarkers** to enhance aquaculture production **through holoepigenomic approaches**. Thus, this project is at **research frontier**, since studying the trained and heritable immunity has been barely explored in fish. To attain this goal, we will focus on specific tissues: (i) skin mucus, and (ii) gonads, which play a crucial role in epigenetic inheritance and sex identity. The project will use two teleost fish species: the European sea bass, an important commercial species, and zebrafish, as a useful animal model. **State-of-the-art methodologies** will be applied, such as single cell (sc)-ATAC seq and scRNA-seq to identify chromatin and gene expression alterations from different cellular types. Further, methylome and metagenomic analyses will help to decipher epigenetics and microbiota alterations after infections. Functional analysis in cell culture systems will be performed and the data from the fish host and its associated microbiota will be integrated from a holo-omic perspective.

The expected results from HOLOSEX will provide valuable insights on the underlying molecular mechanisms involved in sexual dimorphism of the immune response in fish and contribute to sustainable aquaculture.

Our team

We are an international team with strong expertise in epigenetics, microbiota, and fish physiology, and we collaborate with a company that aims to exploit a device to control infections in aquaculture.

Candidates

Candidates should hold a Master's degree in Biology, Genetics, Epigenetics, Bioinformatics, Aquaculture, or a related field, with high academic achievements in both their undergraduate and graduate studies. An excellent level of English is required. Programming skills and bioinformatics knowledge will be considered an advantage.

What do we offer?

A fully-funded four-year PhD contract to work on the recently funded from the Spanish Ministry of Science, research project: A timely holoepigenomic approach to unravel the sexual dimorphism of the immune response in fish (HOLOSEX). PID2023-146286OB-I00 lead by Laia Ribas and Jorge Fernandes.

Starting date: between 1st January 2025 and 1st March 2025
Salary: first year: around 19.000 € gross salary; second, third and fourth years: around 23.500 € gross salary

Location: Institute of Marine Sciences (ICM-CSIC), Passeig Marítim de la Barceloneta 37-49, Barcelona, Spain

Application steps: Interested candidates should e-mail (lribas@icm.csic.es and jorge.fernandes@icm.csic.es), with the subject line "PhD student position" and (1) the CV, (2) a motivation letter describing their interest in the project, and (3) contact information of two potential references.

Application deadline: 1st October 2024

Laia Ribas, PhD
Senior Scientist
www.icm.csic.es
www.ribasreproimmuneteam.wordpress.com
www.hypatiamars.com
Orcid ID: 0000-0001-5538-6236

Jorge Fernandes, PhD
Professor
www.icm.csic.es
www.jmofernandes.com
Orcid ID: 0000-0002-2550-1640