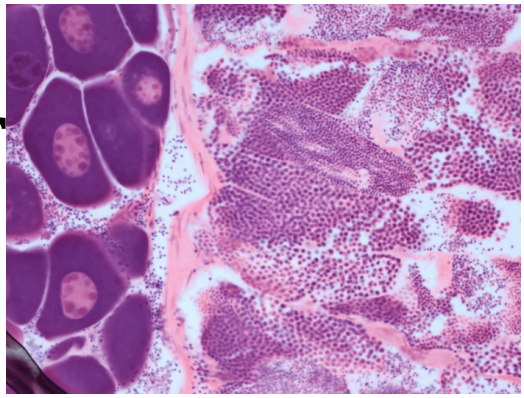
Environment and reproduction under water: (fe)male sex differentiation in fish



~Open and free activity
~18:00h
~Miramar Palace, San Sebastián or streaming

Lecture by Ibon Cancio. Professor of Cell Biology, PIE-EHU

"Is our fish’s reproductive capacity in danger?"

26.Mar 2026

Cod. W05-26

Mod.:
Streaming Face-to-face

Edition
2026

Activity type
Open activity

Date
26.Mar 2026

Location
Miramar Palace

Languages
Basque Spanish

Organising Committee

Description

Reproduction is essential for the survival of any species. Sexual reproduction is nearly the sole mechanism in that regard in the case of animals, and of course fish as well. Sexual reduction in animals requires two different sexes - male and female - to exist. This is called gonochorism. There are species, including many fish, which are hermaphrodite. Yet in those cases, we find male and female gonads at different points of time (they have one sex when juvenile and the other afterwards) or space (gonad divided in two).

Sexual segregation is genetically determined in the majority of species – as is the case of mammals; although we do not always find sexual chromosomes. However, the sex of fishes is not always ‘written in stone’ or simply genetically determined. Environmental conditions – such as temperature, food availability, the pH, social conditions or the presence of pollutants – can prevail over genetically established rules, causing changes in the development of the fish gonads. Thus, genetically male specimens can be feminised and vice versa.

Several chemical pollutants – known as endocrine disruptors – that started to appear in our environment some time ago have been grounds for concern in recent years. There are many and vary as regards their composition, but some have a structural similarity to estradiol (female hormone). These include synthetic hormones, but also alylphenols that are used as surfactants, some compounds that are used to make plastics, and several pesticides. They are considered to be xenoestrogen due to their effect.

Consequently, fish receive feminising signals from the environment that prevail over the message of their hormonal background. Their impact is greatly noted around discharge points of wastewater treatment plants, as male fish found at those point frequently produce roe in the testicles. That is known as intersex testicles. Of course, this feminisation response has repercussions for the reproductive capacity of the population. In recent years, populations of feminised mullets have been found in all the river estuaries of the Basque Country, particularly in the Urdaibai river estuary near Gernika and in Pasaia.

Thanks to the molecular and histological study of all those fish, we have been able to study the Urdaibai situation since 2007, and we have good news! In 2021, the Gernika wastewater treatment plant and operations were transferred to the Bermeo plant, where the discharge is into the open sea. Consequently, while around 50% of the Gernika male mullet had roe in their testicles (2007-2021), we have not seen this type of fish since 2022.

Program

26-03-2026

18:00 - 19:15 “Arrak ar eta arrainak eme: ingurumena eta sexua urazpian“

Arriskuan al dago gure arrainen ugaltzeko ahalmena?

Ibon Cancio Uriarte | PIE - EHU - Zelulen Biologian irakaslea

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Ana Galarraga zientzia-komunikatzaileak hizlariarekin elkarrizketa izango du hitzaldia amaitutakoan / La divulgadora científica Ana Galarraga mantendrá un diálogo con el ponente una vez finalizada la conferencia

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Teachers

Ibon Cancio Uriarte

Professor of Cell Biology (University of the Basque Country)

Professor at the Science and Technology Faculty at the UPV/EHU since the year 2000 and Director of the Master’s Degree in Environmental Pollution and Toxicology (2010-2020). Researcher of the ‘Cellular Biology in Environmental Toxicology’ consolidated research group at the Plentzia Marine Research Centre (PiE-UPV/EHU) Ibon Cancio’s main line of research focuses on the molecular and cellular study of the sexual differentiation of fish, where he analyses the effects that environmental conditions – particularly pollution – can have (feminisation of the males and the intersex phenomenon). Furthermore, he oversees biomonitoring programmes that use molecular methods to study the biodiversity of the marine environment. Director of 9 international dissertations and 18 Master’s theses. 78 articles published in JCR international journals. Leader of different research projects in Europe, Spain and the Basque Country. Director of the Spanish hub of the EMBRC European research infrastructure (2014-2025). Two patents for molecular sexing of fish.

Registration fees

REGISTRATION - FACE-TO-FACE	UNTIL 26-03-2026
General	0 EUR

REGISTRATION - ONLINE	UNTIL 26-03-2026
General	0 EUR

Place

Miramar Palace

Pº de Miraconcha nº 48. Donostia / San Sebastián

Gipuzkoa