The University of Hong Kong
School of Biological Sciences

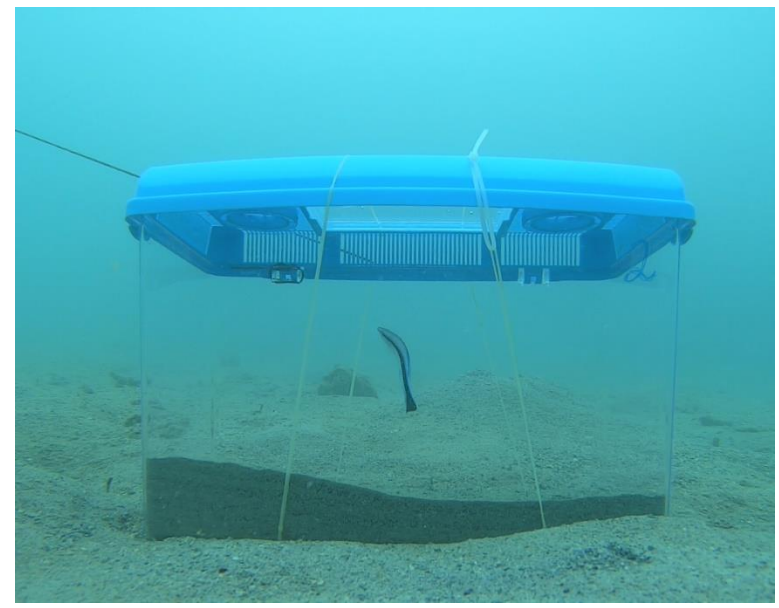
Public Seminar

Neuromolecular signatures of fish social interactions under normal and climate change conditions

Date: 16 November 2021

Time: 5:00 pm

Venue: 6N-11 & Zoom



About the speaker:

Sandra is a Marine Biologist from the Universidad del Valle, Colombia. She has worked on the population genetics of a coral reef fish among Marine Protected Areas from the Colombian Pacific and has led conservation projects with the local government. During her Master's degree she has been working on identifying the neuro-molecular mechanisms used by an important cleaner wrasse when interacting with hosts under different climate change scenarios.

Abstract:

Interactions between species are fundamental in nature, yet little is known about the molecular processes involved in fundamental relationships between two species. The coral reef fish *Labroides dimidiatus* displays cognitive abilities in its interactions with others by providing cleaning services making it an ideal model to understand the molecular underpinnings and the influence of the environment on the interaction behaviour. In my thesis, I investigated the mechanisms responsible for this behaviour using *Acanthurus leucosternon* as client and exposed interacting fish to control and three different treatments of climate-change scenarios with elevated CO2 and temperature. Among the three brain regions studied, the largest transcriptional responses were in the hind- and forebrain regions when both species interacted. For *L. dimidiatus* in control, the brain response involved, among others, immediate early genes, dopaminergic and glutamatergic pathways and neurohormones. In contrast, the client displayed fewer molecular alterations mostly involving pituitary hormones. Finally, under future climate change conditions, transcriptional changes were related with stress, histones, metabolism and behavior alteration. Genes involved in behaviour were affected by each environmental treatment in isolation, but not when two were combined, suggesting no additive effect on the cognitive abilities of *L. dimidiatus*. Taken together, future environmental conditions influence the molecular programming involved in the interaction behaviour for *L. dimidiatus* and its clients with possible large-scale effects on the coral reef ecosystems.