Brief description of the thesis

Tile of thesis
Ecophysiological responses and genetic traits of clams under extreme climatic conditions and in interaction with pathogens

Abstract
Brown ring disease (BRD) in Manila clams has caused severe losses of up to 80% in farms in Brittany since 1989. This disease is caused by the marine pathogen Vibrio tapetis. The intensity of infection in clams is highest in winter and pre-spring conditions. Climate change could play a major role in this infection, as mild winters combined with abundant rainfall amplify the development of BAM in clams. And for some years now, in Normandy and Brittany, episodes of mortality and high prevalence of BAM have been observed in the summer period, for reasons that are still unknown. All these results lead us to the hypothesis that a changing environment could modify the ecophysiological responses and genetic traits of clams and modulate host-pathogen interactions. The objective of this thesis is to study the fundamental and current issue of ecophysiological responses of Manila clams to climate change and the consequences on their susceptibility to pathogens. This will enable us to better predict the future state of clam populations in Brittany in the context of climate change, and thus better anticipate the future consequences on the production of this marine bioresource of economic and ecological interest, particularly for the Brittany region.

Context
The way in which aquatic organisms will react to future climate change and infections is one of the most active priority science fronts at LEMAR. It is in this context that the Clim-act thesis project proposes to study the adaptive responses of clams to extreme events (IPCC scenarios) and the emergence of infectious agents. This highly interdisciplinary thesis is integrated into an international context (international research project IRP CNRS "ClimClam" 2022-2027). The thesis, co-supervised by LEMAR and the "Dipartimento di Biomedicina Comparata e Alimentazione (BCA)", offers a unique opportunity to compare the effects of global change on two contrasting ecosystems where clams are farmed in Europe: the Atlantic/Brest Sea/Iroise Sea and the Mediterranean/Venice Lagoon. This thesis work will be supported and promoted thanks to the networks of partners of the IRP CNRS Climclam of LEMAR (Océanopolis, Océanolab project; SATMAR company and artist researchers).

Key words : climate change, bivalve, health, vibriosis, microbiome, immunity, metabolism, post-genomics, genetics