# ENVIRONMENTAL PHYSIOLOGY

Responses to environmental stress in marine invertebrates: utilization of the bivalve model the mussel *Mytilus galloprovincialis*

1) Effects of emerging contaminants on mussel physiology

Research in environmental and comparative physiology, mainly focused on the evaluation of the effects of emerging contaminants (estrogenic chemicals, pharmaceuticals, nanoparticles, in particular nanoplastics) on mussel physiology, from molecular to organism level, and identification of their mechanisms of action. In vitro e in vivo studies on immune function, lipid homeostasis, embryo development. Comparison with mammalian models. Application of the biomarker approach for evaluating early responses to environmental stress and the health status of individuals.

2) Mechanisms of innate immune response to marine bacteria potentially pathogenic for bivalves: implications in aquaculture.

In collaboration with the Environmental Microbiology group. Studies on the mechansims involved in the specificity of innate immunity in resistant (mussels) and susceptible (oyster) species, utilizing different vibrio species and strains isolated from bivalve mass mortalities or from different environments .Relationship between the immune system and associated bacterial communities (microbiome) in bivalves.
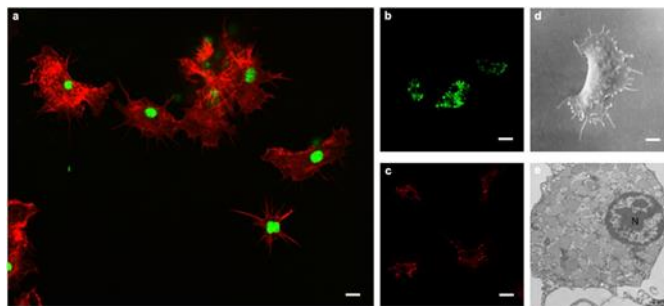
3) Physiology of early larval development in mussels

In collaboration with the Lab. de Biologie du Developpement de Villefranche-sur-mer, Sorbonne University,–CNRS, France. Research on the mechanisms involved in first biomineralization processes in early larvae, on neuroendocrine regulation of morphogenetic processes and their possible modulation by environmental stressors.
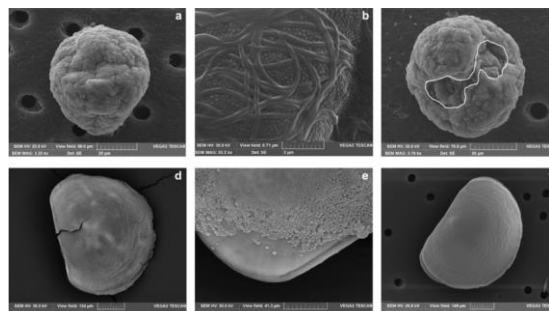
Keywords: *Mytilus*, emerging contaminants, biomarker, immune response, larval development

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