Research Engineer position– Epidemiological Modeler (M/F)

**Where :**- Unité Adaptation Santé des Invertébrés Marins (ASIM), Ifremer, La Tremblade 17390 (<https://asim.ifremer.fr/>)

- Laboratoire Interactions Hôtes-Pathogènes-Environnements (IHPE), UMR5244 Montpellier (<https://ihpe.fr/>)

**Key words :** Mathematical modeling, Infectious disease epidemiology, Immune priming, Magallana gigas

**Period :** 10 months from October 1st of 2025 to July 31st of 2025

**Context :** As part of efforts to combat the herpesvirus disease (OsHV-1) affecting Pacific oysters (Magallana gigas), we aim to assess the effectiveness of innovative prophylactic interventions, particularly immune priming (or antiviral stimulation). The objective is to quantify the impact of this approach on virus transmission dynamics at both individual and population levels, using epidemiological modeling tools. This assessment will contribute to better-informed health management strategies in oyster farming.

The recruited person will join the ANR Primoyster project and will be involved in Work Package 3, entitled "Impact of immune priming on disease dynamics". The position will be primarily based in La Tremblade (ASIM), with regular travel to Montpellier to collaborate with project partners from the ANR consortium and the IHPE research unit.

**Main mission :** Develop a compartmental epidemiological model and establish simulation scenarios to test in order to evaluate the impact of immune priming in Pacific oysters on the transmission dynamics of the OsHV-1 virus.

**Task description :**

- Develop epidemiological models (compartmental, individual-based, or spatially explicit) to simulate the transmission dynamics of the OsHV-1 virus in M. gigas, building on existing models.

- Integrate immune priming into the models, accounting for its effects on susceptibility, infectivity, and disease progression.

- Analyze experimental data, in collaboration with biologists, to parameterize and calibrate the models.

- Conduct numerical simulations to explore different intervention scenarios and assess their epidemiological impact at various scales (individual, batch, or oyster farming area).

- Validate and assess model robustness, including through sensitivity and uncertainty analyses.

**Desired skills :**

Knowledge / Expertise

- Fundamental concepts in the epidemiology of infectious diseases.

- Mathematical and computational modeling methods (compartmental, individual-based, spatial).

- Applied statistics for the analysis of biological and epidemiological data.

- Background in immunology, virology, and aquatic animal diseases is a plus.

- Scientific programming languages and tools: R, Python, or equivalent.

- Techniques for model fitting and calibration (e.g., MCMC, ABC, optimization).

- Methods for sensitivity and uncertainty analysis.

- Collaborative research environments (e.g., Git, scientific writing).

Skills

- Designing, implementing, and analyzing complex epidemiological models.

- Adapting models to experimental or field data.

- Interpreting simulation results within a biologically realistic framework.

- Automating reproducible analysis and simulation pipelines.

- Visualizing spatio-temporal dynamics (maps, plots, animations).

- Writing technical reports and scientific publications.

- Collaborating within multidisciplinary teams.

- Clearly communicating results to diverse audiences (scientists, managers, stakeholders).

Interpersonal Qualities

- Scientific rigor and critical thinking.

- Autonomy in task management and problem-solving.

- Ability to communicate and adapt to different audiences.

- Initiative and proactive mindset.

- Strong team spirit and interest in co-development approaches.

- Flexibility in dealing with evolving projects and uncertain data.

**How to apply :**Formal application must be performed on CNRS plateform.

<https://emploi.cnrs.fr/Offres/CDD/UMR5244-MARTRA-001/Default.aspx>