Could the filament be the weak point of salmon louse?

Role of salmon louse *Lepeophtheirus salmonis* and *Caligus elongatus* frontal filament-associated proteins in immune modulation and parasite attachment

Virginie Comorge
virginie.comorge@uib.no
Department: BIO

Background and motivation

Molecular biologist interested in investigating host-parasite/pathogen interactions.

Previous research on interactions between:
- Breeding chicken and parasitic red mite (ecology),
- The plant *Arabidopsis thaliana* and the bacterium *Ralstonia solanacearum* (molecular biology).

Motivation to join the SEAS program: gain knowledge in marine biology and develop new skills in molecular biology.

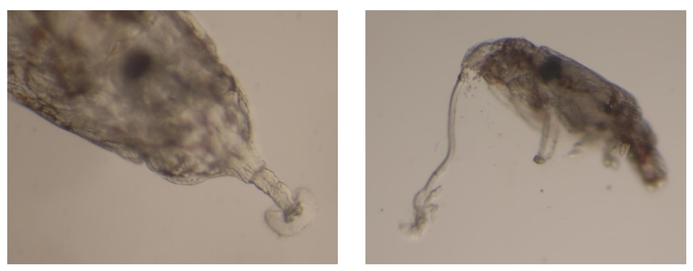
Adult salmon lice

Project description

To find alternatives for the use of chemical and mechanical treatments, new methods must be developed to protect wild and farmed salmon from salmon lice infestations such as the development of vaccines. The frontal filament is essential for the salmon louse to stay attached to the fish during its early-parasitic stages and very little is known about its composition and formation. This project aims at **investigating the nature and the role of proteins associated with the frontal filament in the host-louse interaction**.

Main questions

- How is the filament of sea lice formed?
- What is the filament of sea lice made of?
- Do filament-associated proteins modulate fish immune responses?



Salmon louse (left) and *Caligus elongatus* (right) filaments

SCAN ME

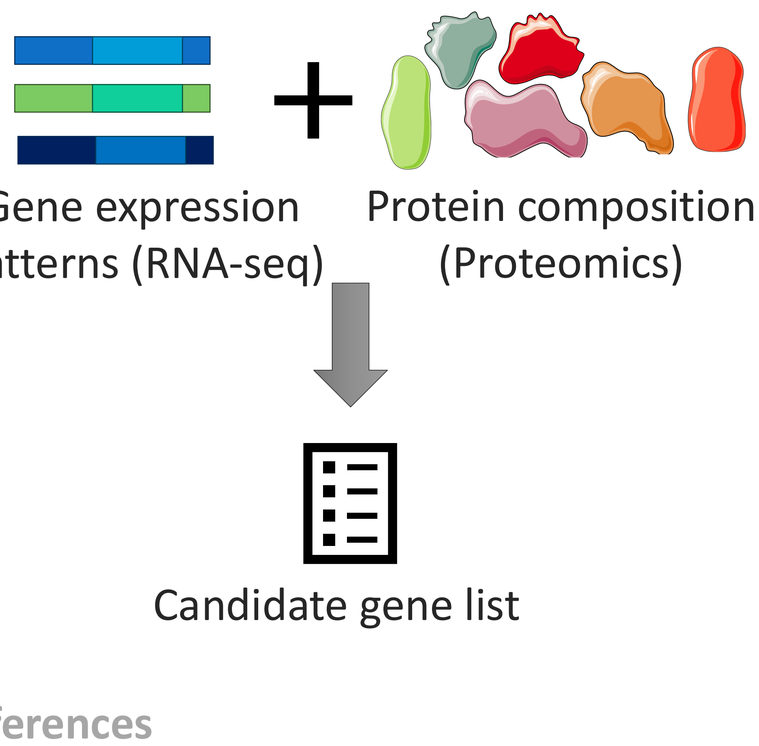
Marine sustainability

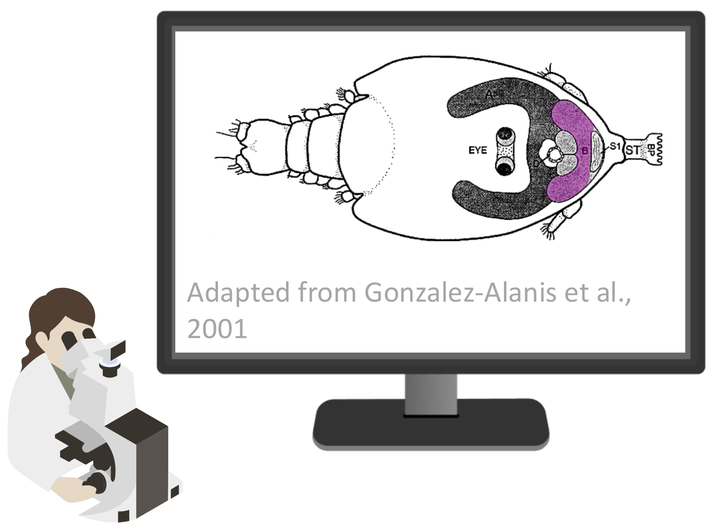
Find alternatives for the use of chemical and mechanical treatments against sea lice in aquaculture.

Protect farmed salmons from sea lice infestations.

Highlighted results

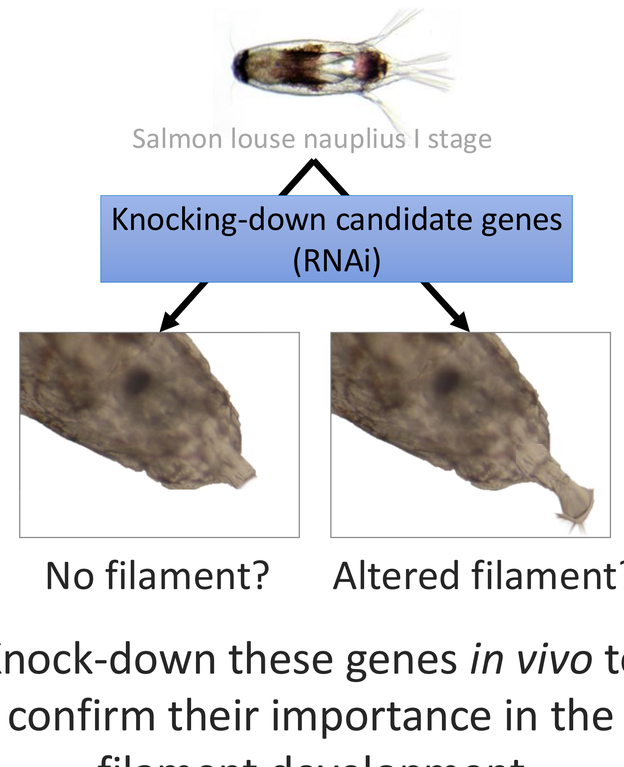
- Identification of 5 candidate genes in salmon louse possibly linked to filament development





Found out where these genes were expressed in the salmon louse body indicating if they could be filament-related genes (In Situ Hybridization)

Next step



Knock-down these genes *in vivo* to confirm their importance in the filament development (RNAinterference)

References

Bioicons: Servier, DBCLS, Simon Dürr
Freepik; AmethystDesign
Adult salmon louse from the SLRC center
Chalimus I salmon louse picture taken by C. Eichner and L. Hamre, nauplius I by C. Eichner. The «no» or «altered» filament pictures were artificially modified by V. Comorge for illustration purpose only.
Gonzalez-Alanis, P., Wright, G. M., Johnson, S. C., & Burka, J. F. (2001, June 1). Frontal Filament Morphogenesis in the Salmon Louse Lepeophtheirus salmonis. Journal of Parasitology.

Supervisory team
Aina-Cathrine Øvergård (BIO)
Christiane Eichner (BIO)

This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement No 101034309.