



Characterization of *Paramoeba perurans*

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Analytiq offer analyses for a range of different pathogens

Virus	Bacteria	Parasites
SAV	<i>Flavobacterium psychrophilum</i>	Paranucleospora theridion,
ILAV	<i>Yersinia ruckeri</i>	Nucleospora cyclopteri
ILAV HPRO	<i>Renibacterium salmoninarum</i>	Parvicapsula pseudobranchiola
IPNV	<i>Francisella piscicidae subsp. Noatuensis</i>	Paramoeba sp.
VNN	<i>Piscirickettsia salmonis</i>	Paramoeba perurans
VHSV	<i>Aeromonas salmonicidae</i>	Ichtyobodo sp.
PMCV	<i>Tenacibaculum</i>	Ichtyobodo necator
IHNV	<i>Vibrio anguillarum O1</i>	Amyloodinium ocellatum
EHNV (+ other iridoviruses)	<i>Vibrio ordalii</i>	Gyrodactylus salaris
Rhabdoviruses	<i>Branchiomonas cysticola</i>	
Halibut reovirus	<i>Syngnamydia salmonis</i>	
Salmonid calicivirus	<i>Piscichlamydia salmonis</i>	
	<i>Clavochlamydia salmonicola</i>	
	<i>Pasteurella sp.</i>	
	<i>Moritella viscosa</i>	





Flavobacterium spp.

Cand. Piscichlamydia salmonis

Cand. Clavochlamydia salmonicola

Cand. Branchiomonas cysticola

Tenacibaculum spp.

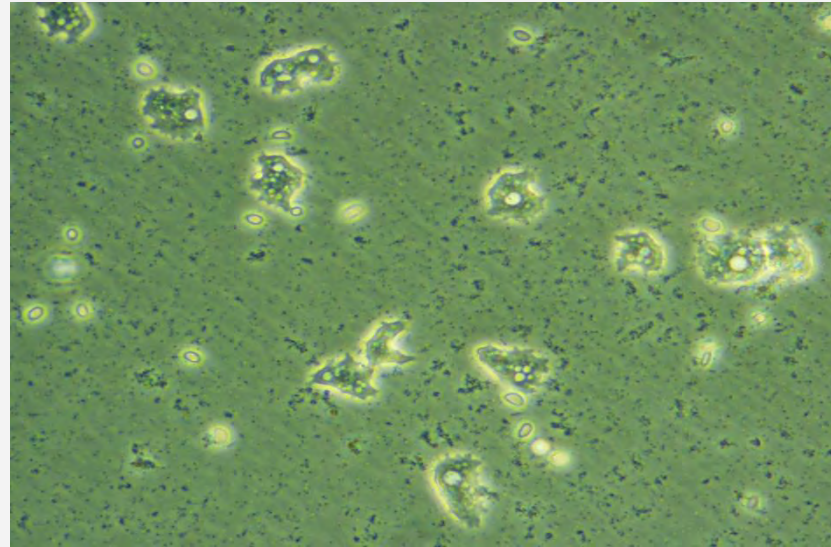
Paranucleospora theridion (Microsporidia)

Ichtyobodo sp. (Flagellate)

Parvicapsula pseudobranchicola (Myxozoa)

***Paramoeba perurans* (Amoebae)**

Isolation and characterisation of *Paramoeba perurans* with emphasis on phenotypical and genetically characterisation on different strains from salmon and other species



Start 2015

The Norwegian Seafood Research Fund - FHF



Main aims of the project

- Increase knowledge on the variation between clones of *P. perurans* from farmed salmon and a selection of wild fish species
- Establish a system for deep freezing isolates
- Develop tools for investigating the spread of *P. perurans*
- Increase knowledge on virulence markers

Aims

- A. Phenotypical characterization
- B. Optimizing culture and freezing conditions
- C. Challenge trials
- D. Possible influence of symbionts
- E. Immune response
- F. Genotyping
- G. Characterization of isolates
- H. Prevalence of *P. perurans* in gill disease

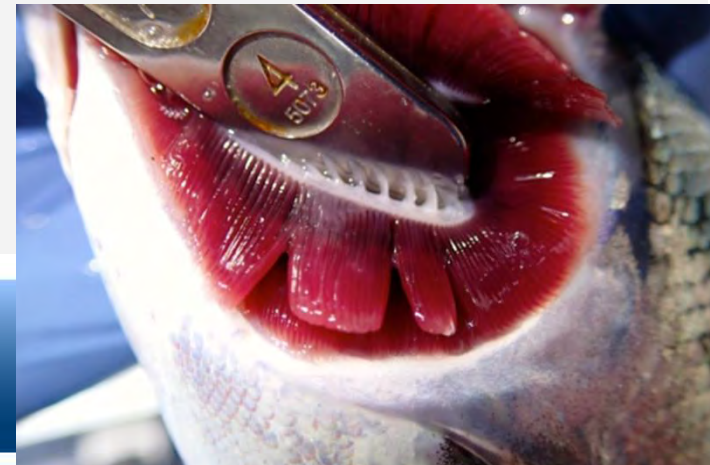
WP 1. Phenotypical characterization

- Establish freezing methods to preserve the phenotype of the different clones
- Knowledge on possible cyst stages
 - Possibly provoke a pseudo cyst stage *in vitro*
- Morphological studies
 - Light and electron microscopy
- Cell culture studies, MYA agar, etc.
- Exocrine protein (EPC)
- Sequencing (WP 4)



WP. 2. Challenge trials

- Host tropism
 - Clones from Salmon, cleaner fish, Pollock etc.
- Virulence
 - Mortality, pathology, immune response
 - Gen markers (WP 5&7)
 - Influence of many passages in cell culture
- ILAB has established challenge models for
 - Salmon
 - Rainbow trout
 - Cleaner fish



WP. 3. Possible influence of symbionts

- Study the possible influence of symbionts on the virulence of *P. perurans*
 - *Perkinsela* sp
 - Flagellate-like ameba
 - Influence on the virulence of *P. perurans*?
 - Bacteria
- *P. perurans* as pathogen vector?



WP. 4, 5 & 7. Genotyping

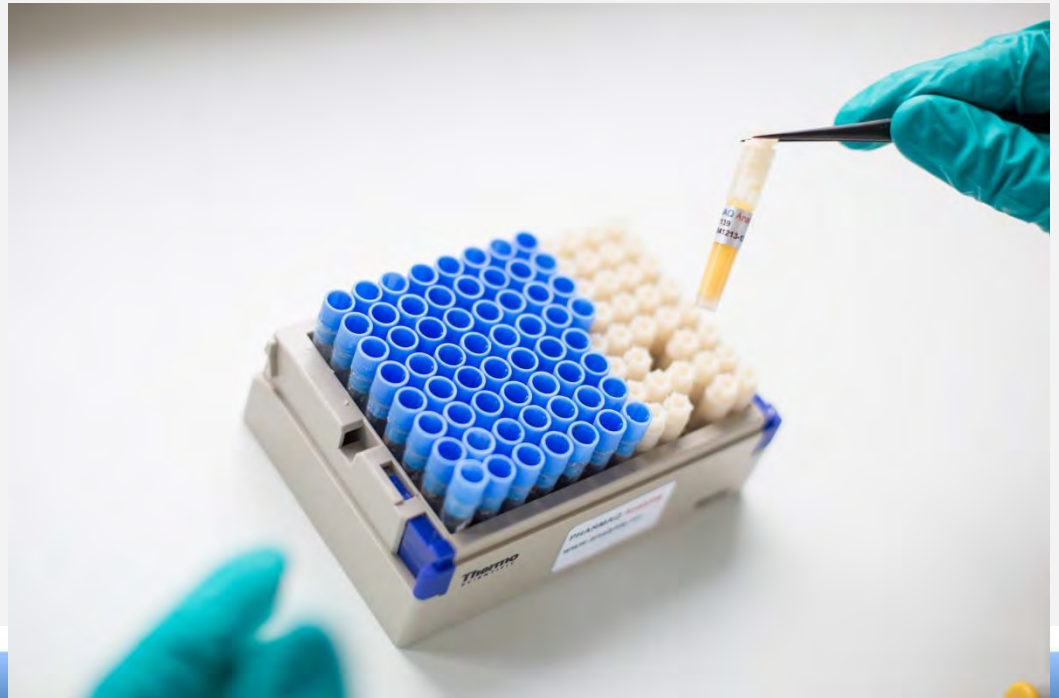
- Development of genotyping methods
 - SNP, VNTR etc.
- Virulence markers
- Genotyping of *P. perurans* from different
 - Fish species
 - Geographical areas
 - Norway, USA, Chile, Tasmania, Ireland, UK etc.
 - AGD outbreaks with high and low mortality
- Full genome sequencing of a virulent clone

WP. 6. Distribution of *P. perurans*

- Geographic distribution
- Prevalence of *P. perurans* in historical material from farmed salmon with gill problems
- Prevalence of *P. perurans* in other species
- Distribution of virulence markers

WP.8. New methods for detection

- More sensitive detection methods
- Specific PCR for *P. perurans* is now available
 - Analytiq etc.



A close-up photograph of concentric ripples on a blue liquid surface, likely water. The ripples are centered in the upper half of the frame and spread outwards, creating a sense of movement and depth. The lighting highlights the crests of the ripples, giving them a shimmering appearance.

We need knowledge to stop this bug!