

# FISHGUARD : fast, cost-effective and in-field screening tests



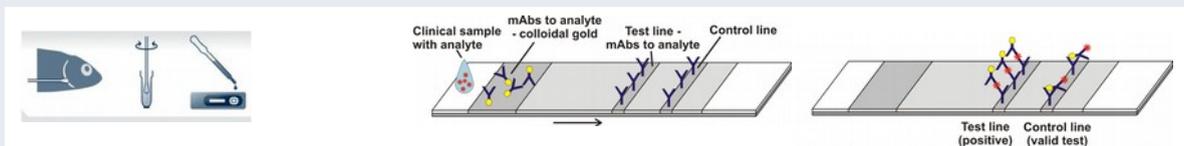
Improve prevention and management of two viral infections for the sustainability of the European aquaculture industry



European Project – Eurostars-2 programme – 2015 - 2018

## Aims & context

FishGuard aims at developing rapid, cost-effective and in-field tests to detect two fish pathogens with high specificity and sensitivity.



**TARGETS:** *Viral hemorrhagic septicemia virus* and *Infectious hematopoietic necrosis virus*.

**WHY:** These two viruses are responsible for the highest losses in fish farms (with up to 95% mortality) and they are highly contagious, thus requiring short reaction times.

**PROBLEM:** Current detection methods are expensive (50 EUR) and take long (2-3 weeks).  
=> Need for rapid, cost-effective and in-field screening tests.

## Our contribution: Expertise in computational biology

### MACHINE LEARNING

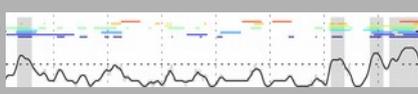
- Extract reference protein sequences (uniprot) to feed machine learning algorithms:



- Get consensus residues and "jury"-score (in-house combination rule)

- Post-processing to build epitopes of the desired length matching precise criteria.

### EPITOPES prediction & ranking



### BIOINFORMATICS

- Retrieve sequences from GenBank, BLAST, ...
- Align sequences (ClustalW, MUSCLE,...).
- Position-specific conservation scores.



### STRUCTURAL BIOLOGY

- Residue hydrophobicity.
- Residue solvent accessibility (Jpred).
- Post-translational modifications, ...