

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



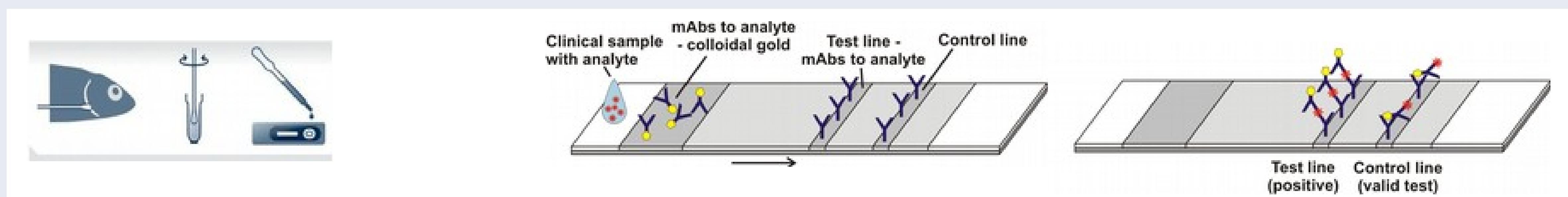
## Improve prevention and management of two viral infections for the sustainability of the European aquaculture industry




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

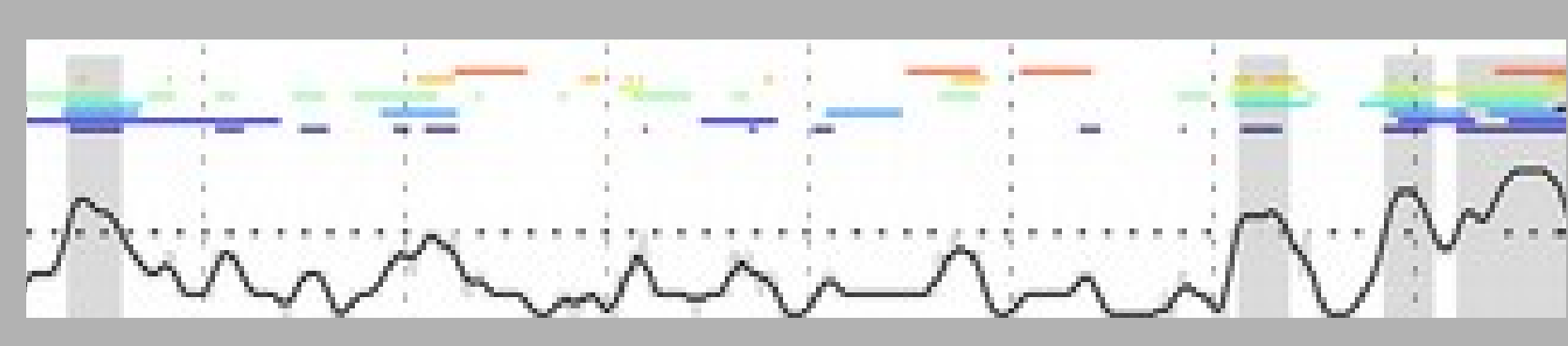
- Extract reference protein sequences (uniprot) to feed machine learning algorithms:



- 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, ...