

Nodavirus in Atlantic halibut- possible vaccine strategies

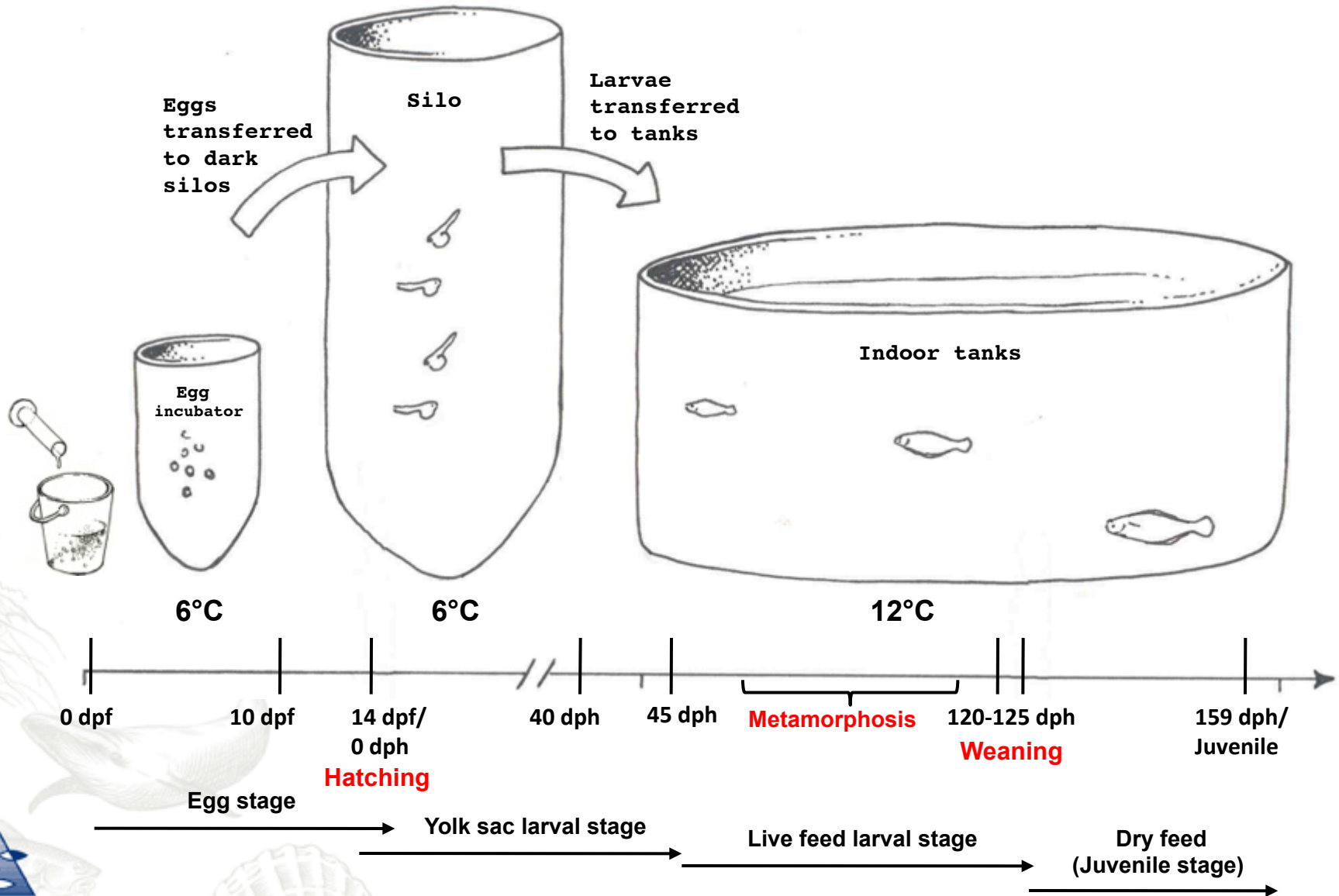
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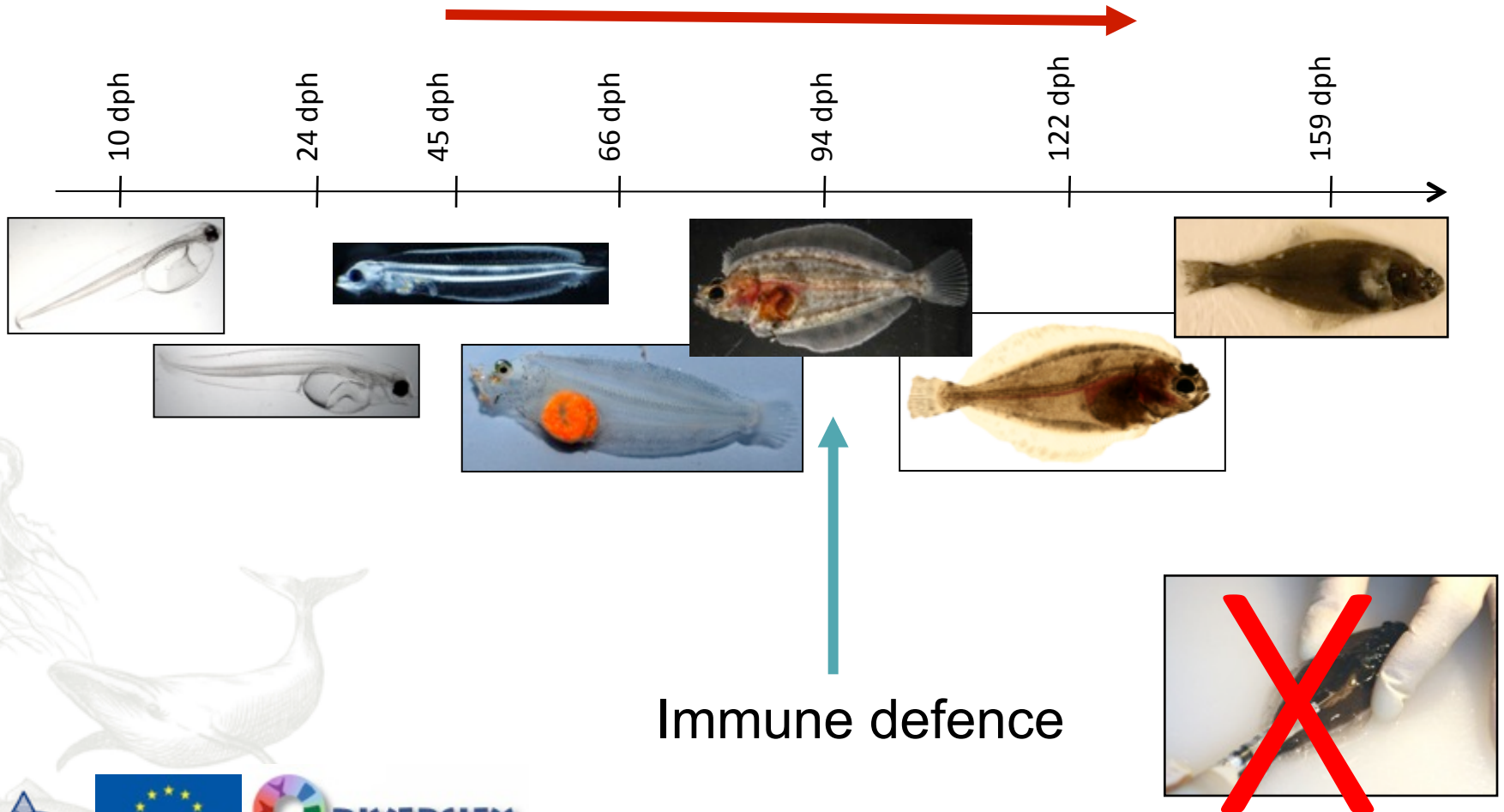


Halibut aquaculture



Halibut development

Possible mortality due to viral infection

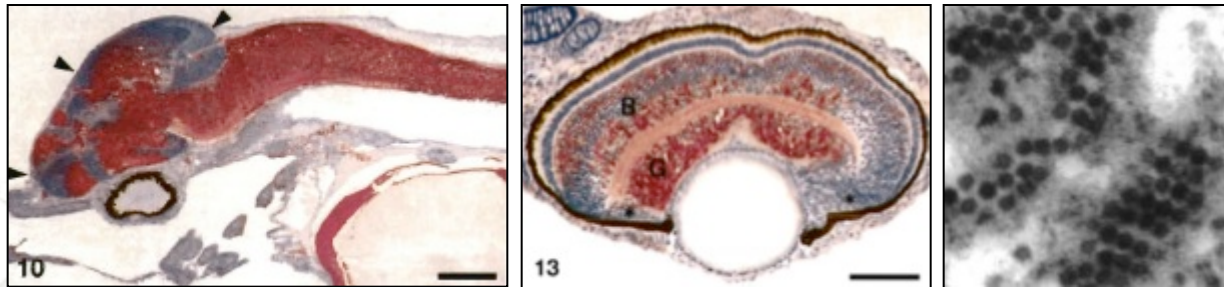


Immune defence



Nodavirus

- Betanodavirus, *Nodaviridae* family
- Small, non-enveloped ssRNA virus
- Viral encephalopathy and retinopathy (VER)
- Central nervous system (CNS) and retina
- Abnormal swimming pattern and loss of appetite
- Larvae and juvenile stages affected by VER



Grotmol et al. 1999: Bath challenged halibut yolk-sac larvae



Nodavirus

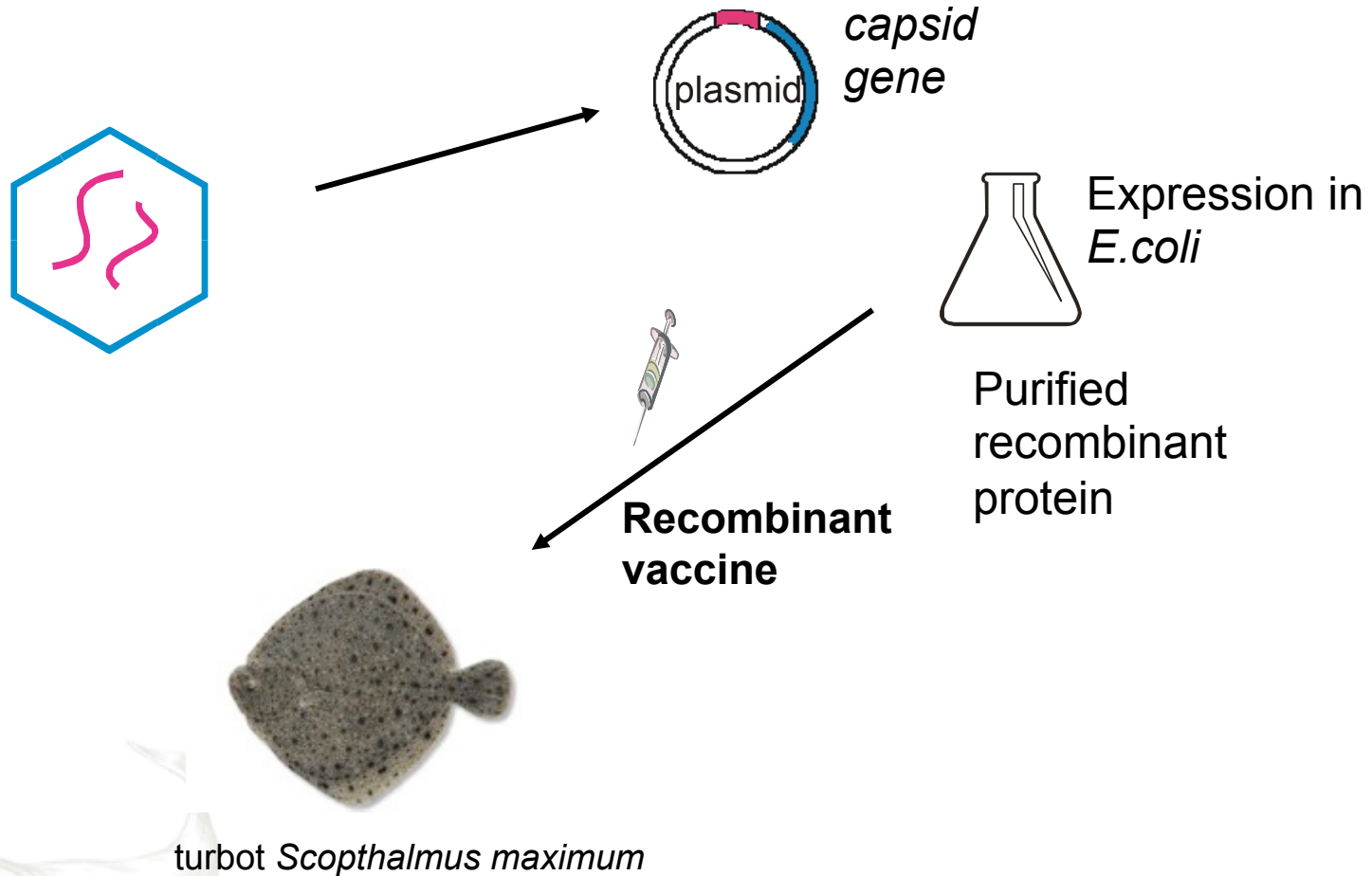


Size: 25-30 nm

Genom: RNA1 3100nt

RNA2 1400nt

Vaccine development



Vaccination/challenge- turbot

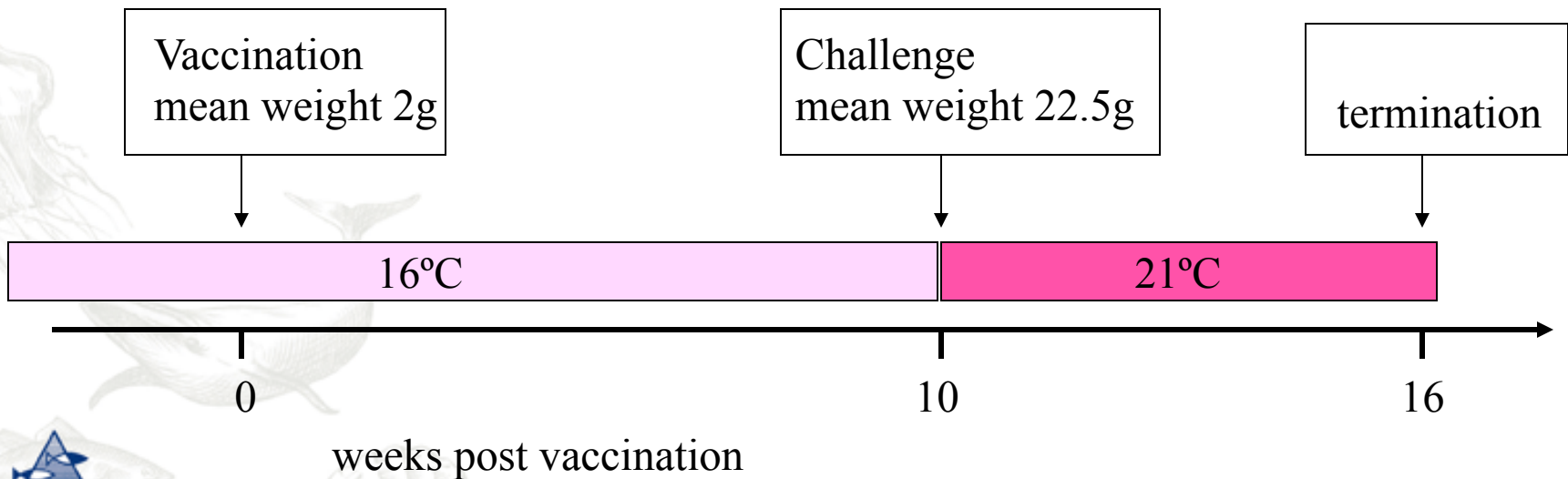
Scophthalmus maximum (2x35 fish)

Vaccine:

Recomb. vaccine: 10 μ g/10 μ l i.p.

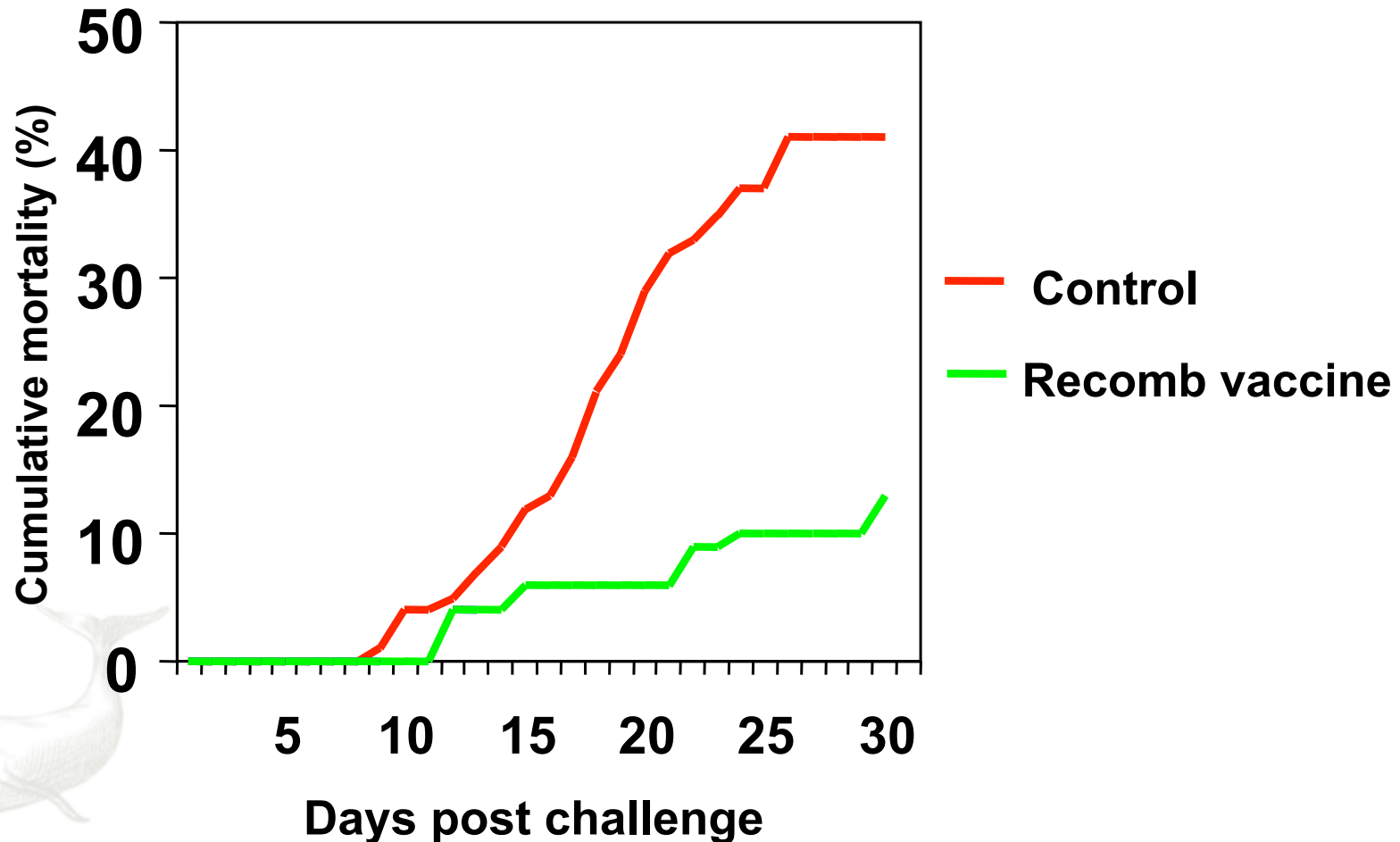
Control: 10 μ l saline i.m.

Challenge: Nodavirus 10⁷ TCID₅₀ per fish



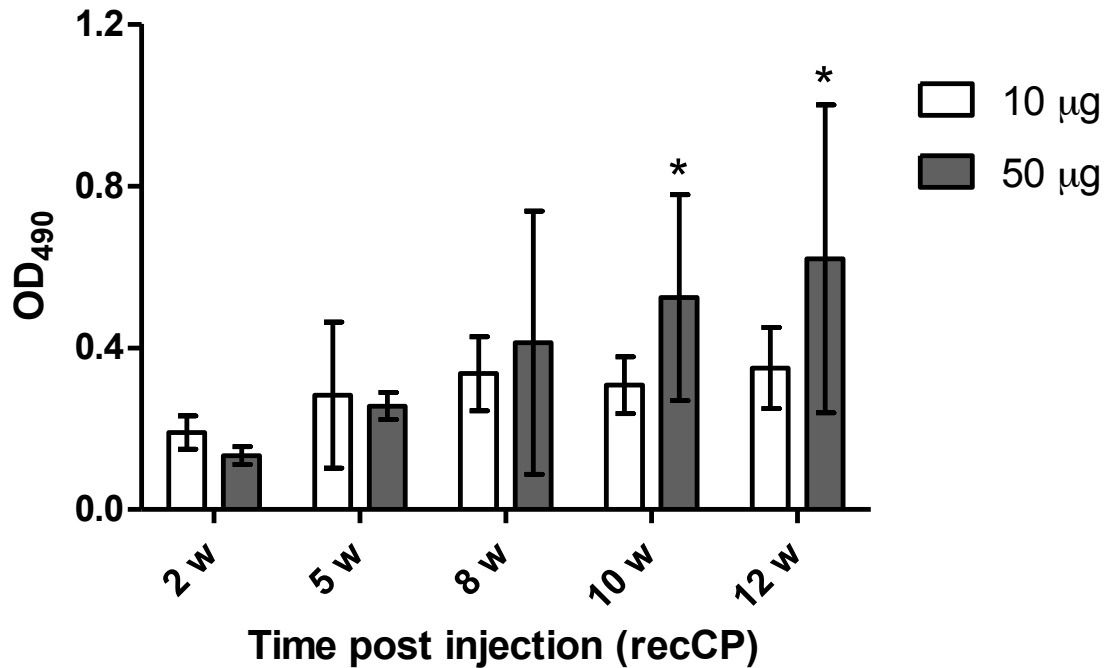
Vaccination/challenge- turbot

Vaccine-10 μ g/10 μ l i.p., challenge- Nodavirus 10⁷ TCID₅₀ per fish



Vaccination - Halibut

Humoral response (production of antibodies by B-cells)

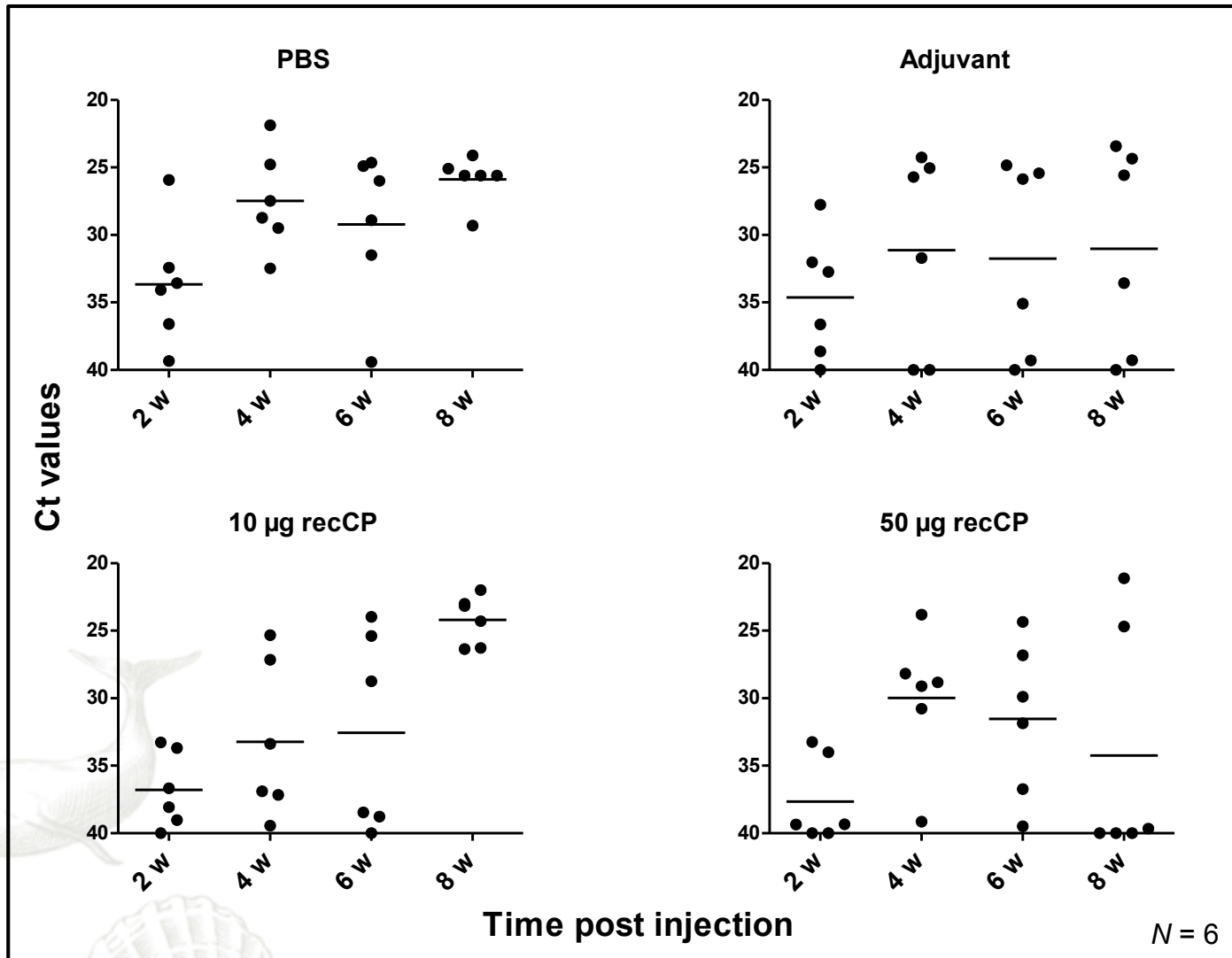


$N = 6$



NNV challenge

Nodavirus RNA2 level



N = 6

WP 26 Atlantic halibut

Institute of Marine Research
Sonal Patel and Audun Nerland

Objective: Determine the effect of delivering recombinant capsid protein during late larval stages on protection to nodavirus (VNN)

Task 26.1 Production of VNN capsid protein

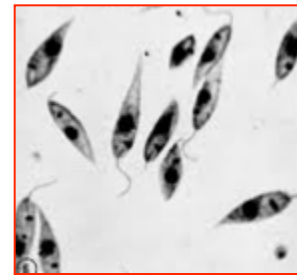
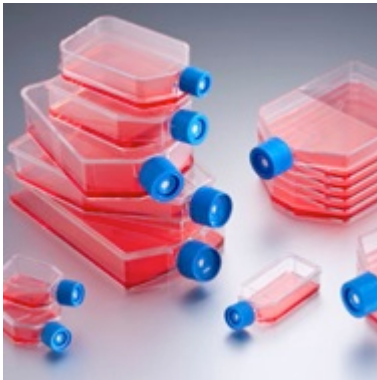
Task 26.2 Monitor and assess immune response and protection

Plan



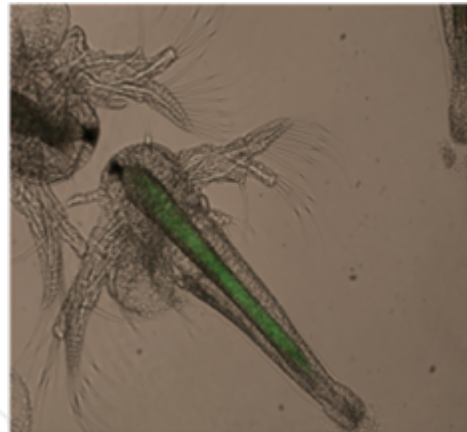
Culture

Protein expression in different systems

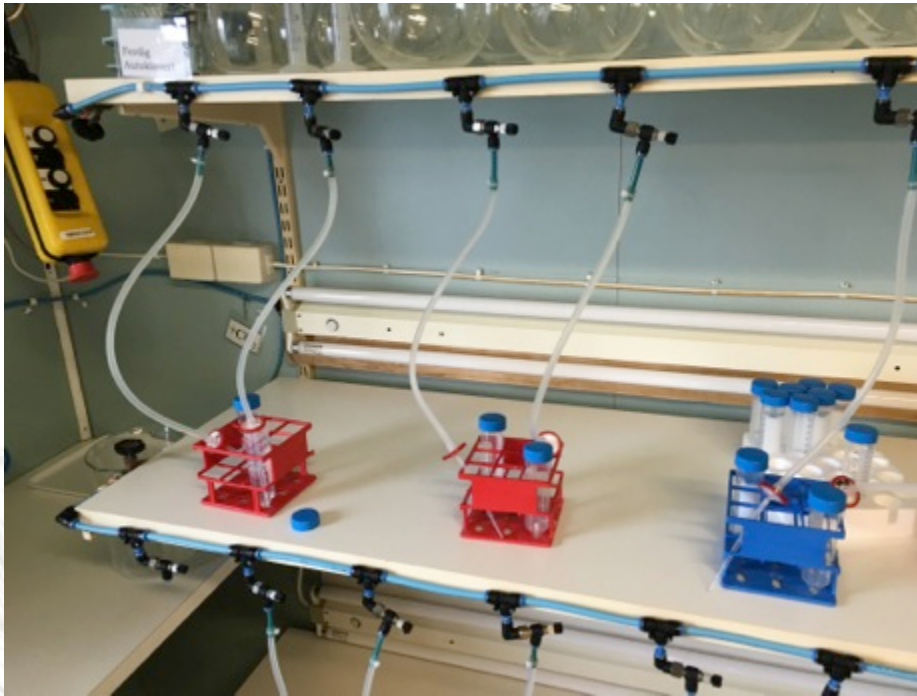


Task 26.1

Task 26.2



Uptake in Artemia



1. Artemia-Negative control

2. Artemia fed

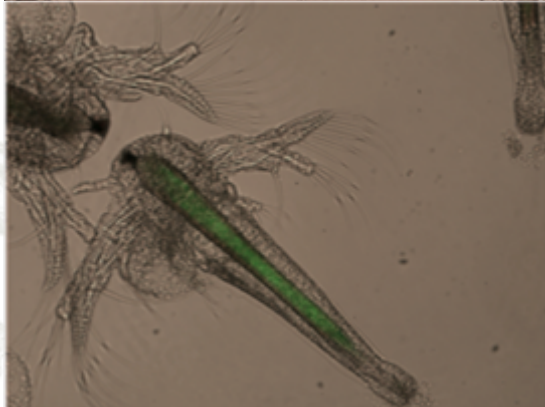
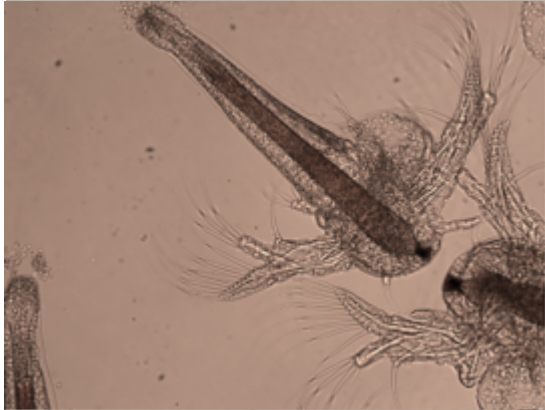
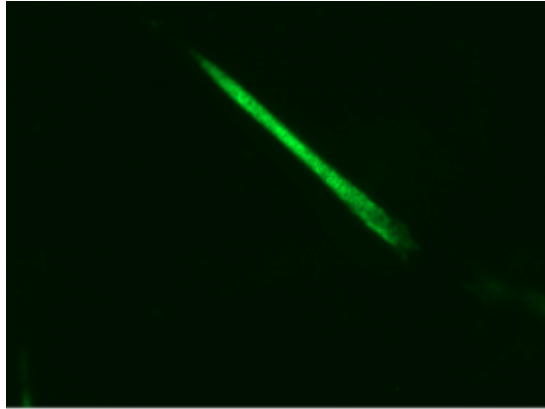
- *L.tarantolae* -GFP
- *L.tarantolae* -VNN expression
- *E.coli* -GFP
- *E.coli* -VNN expression
- Purified VNN capsid protein

3. Purified VNN capsid protein as positive control

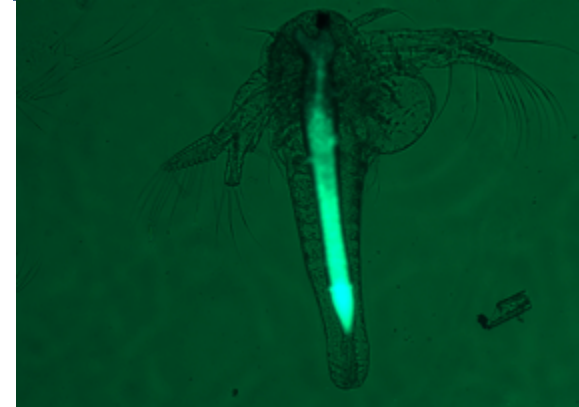
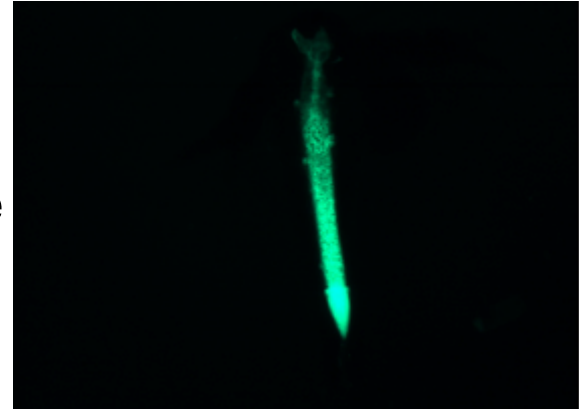


Artemia fed with

E. coli expressing GFP



Leishmania tarentolea expression GFP



Fluorescence

Light

Overlay



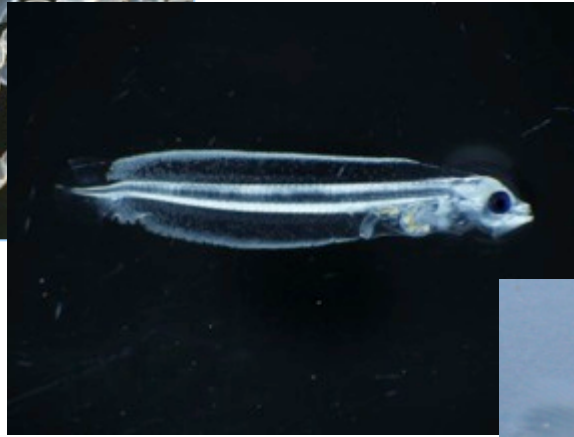
Summary

- We have expressed the VNNV capsid protein in three systems; *E.coli*, *Leishmania* and tobacco plants.
 - Testing expression in microalgae - ongoing
- Both *E.coli* and *Leishmania* cells are filtered from seawater and taken up by Artemia.
- Uptake of tobacco plant and microalgae expressed VNN capsid protein to Artemia – to be tested
- Include optimal antigen expressed both from Diversify and Targetfish





Co-funded by the Seventh
Framework Programme
of the European Union



Thank you!

