



TargetFish Newsflash 17

TargetFish brings together leading European research groups that are experts on the fish immune system and enterprises from the Biotech and Veterinary sectors that aim to commercialize fish vaccines for European fish farming. By developing a targeted vaccination strategy, TargetFish will prevent important fish diseases in European aquaculture industry.

This highlight is part of monthly progress updates by the TargetFish consortium.

targetfish.eu

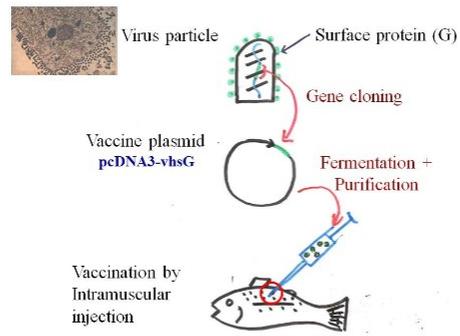
DNA vaccination of rainbow trout against Viral Haemorrhagic Septicaemia induces robust immunity

Immunization of rainbow trout with the DNA vaccine encoding the glycoprotein of the viral haemorrhagic septicaemia virus (VHSV) has proved to be highly effective as a prophylactic strategy

suggesting that the passaging did not promote the selection of virus populations able to bypass the neutralization by serum antibodies.

under different experimental conditions. The immune protective responses induced by this vaccine can be divided into three sequential phases; the early antiviral response, which involves mechanisms of the innate immunity, characterized by its cross-reactivity. This protection is followed by the specific antiviral response and the long-term antiviral response; both involving mechanisms of the adaptive immunity and characterized by being pathogen-specific.

But RNA viruses like VHSV are genetically unstable, and it should be considered that under a specific selective pressure, VHSV could develop mutants that are able to escape from protective mechanisms induced by the DNA vaccine. Knowledge of such risks would be essential for the design of robust and safe DNA vaccination strategies for protection of rainbow trout against VHS under field conditions. Researchers from the group of Host-pathogen interactions at Aarhus University aimed to determine whether VHSV could develop escape mutants following repetitive passages under the selective pressure from a) virus neutralizing serum antibodies induced in DNA-



A previous study showed that VHSV on the presence of neutralizing monoclonal antibodies in cell culture was able, within a few passages, to generate escape mutants. Possibly, a more diverse antibody repertoire induced in the fish by DNA vaccination can explain why VHSV was not able to escape from the neutralizing effect in the present study. Similarly, the VHSV isolated after several passages in vaccinated rainbow trout did not show increased virulence nor increased persistence in vaccinated fish in comparison with the parental virus. This suggested that also “*in vivo*” the virus could not develop mutants able to bypass the immune response. However, some of the vaccinated fish did get infected and could transmit the infection to naïve cohabitant fish. These results demonstrated that the DNA vaccine induced a robust protection against the disease, but also that the fish were not fully protected from infection. It is consequently important not to consider

vaccinated rainbow trout, or from b) the immunity induced in rainbow trout by the DNA vaccine. The virus repetitively passaged in cell culture in the presence of VHSV neutralizing antibodies was as sensitive as the parental virus to serum neutralization,

vaccinated fish as virus free in veterinary terms.

[Click here to read the full article](#)

TargetFish Industry Workshops

Please anticipate another TargetFish Industry Workshop during the 18th International Conference of the European Association of Fish Pathologists (EAFP) in Belfast in September 2017 where the significance of TargetFish highlights and achievements for the aquatic animal health industry will be discussed.



For more information, please visit targetfish.eu or contact the consortium via targetfish.cbi@wur.nl

All rights reserved.

Website: targetfish.eu

Mail address: targetfish.cbi@wur.nl

TargetFish is a large collaborative project funded by the European Commission (Grant Agreement No. 311993) under the 7th Framework Programme for Research and Technological Development.

