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TargetFish highlight

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

Antibodies of fish are not always similar to the antibodies we find in humans

With some 40,000 known fish species generalized observations on the organization of the fish immune system are risky. Further complicating the matter is that fish show obvious anatomic differences from mammals, including diverse adaptations to the aquatic environment. Not different from mammals, however, is that fish B lymphocytes express immunoglobulin (Ig) on their surface and secrete these antigen-specific antibodies during infection or after vaccination. Secreted antibodies are extremely important for fighting bacteria and viruses, especially when they are freely present in mucus or bloodstream.



Different from mammals, which typically express five antibody (Ig) classes, fish express only three different classes. This is not merely of scientific interest, but has functional consequences for immune responses of fish, as summarized by researchers from the Institut National de la Recherche Agronomique (INRA) in Jouy-en-Josas, France (Frontiers in Immunology 2013: 4:28). Two of the antibody classes have been found in all fish species analyzed, with IgM being the main antibody class found in serum. Some species of fish also have IgT, which seems to exist only in fish and is specialized in mucosal immunity, for example in the gut.

During evolution, cycle of duplications have made fish genomes highly variable and also genes involved in the immune system have been affected by this. The duplication events might account for the fact that the immunoglobulin genes of some fish species are among the largest and most complex. Luckily, progress in fish genomics has started to unravel the variation in immunoglobulin gene organization and expression. This provides the opportunity to compare the different repertoire of immunoglobulin genes between healthy and infected fish. Of practical interest may be that temperature variations seem to affect immune repertoires, suggesting that antibody responses may follow distinct temperature ranges.

From a practical viewpoint, a greater knowledge of the antibodies in fish may help us in the design of improved and more-effective fish vaccines and vaccination

strategies to cover the whole life-cycle of the fish.

TargetFish 2nd Industry Workshop

Following the great success of the 1st TargetFish Industry Workshop held during the 16th International Conference of the European Association of Fish Pathologists (EAFP) in Tampere Finland in September 2013, a second Workshop is planned for the 17th EAFP Conference in Gran Canaria, Spain in September 2015. (<http://www.eafp2015.es/>)

The 1st Industrial Workshop was held relatively close to the commencement of the TargetFish project and basically covered the content of the various Work Packages. Two years on most of the Work Packages have now achieved a number of significant discoveries relevant to the aquatic animal health industry. These findings will be described during the Industry Workshop and an opportunity for the researchers and industry partners to meet and discuss the significance and application of these findings on the development of new vaccines, vaccination techniques/strategies, treatments and diagnostics and how they may be taken forward into commercial applications.



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

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