



TargetFish Newsflash 18

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.

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Genetic differences in resistance of common carp strains to Koi herpes virus disease

Common carp (*Cyprinus carpio*) is among the five most produced fish species worldwide, including in eastern and central Europe aquaculture. Koi herpes virus disease (KHVD), which is caused by the CyHV-3 virus, became a

Common carp producers, especially in Europe, prefer producing fish that have almost no scales covering their body, a trait called mirror carp. However, it could be that scales help protecting the fish from outside pathogens and this is

serious problem for farmers across the world with losses of up to 100% of the pond crop. There are many different common carp strains used in aquaculture that exhibit significant genetic differences from each other. Developing strains that have resistance to viral diseases is not only important for sustainable aquaculture but it is also an indispensable resource for identifying what are the host genes that play important roles in viral infection in order to develop effective vaccines and potential drugs. A group of researchers from the Hebrew University of Jerusalem have been using crosses among different carp strains to generate multiple fish families that range from 10%-90% survival rate after infection with CyHV-3. They demonstrated that crossing between fish from resistant families produced resistant progeny and vice versa, crossing susceptible parents produced susceptible progeny. These results confirmed the genetic and heritable basis of resistance, which will allow further development of resistant broodstock lines for mass production of resistant fish.

one of the reasons why commercial carp strains are susceptible to KHVD. In further experiments, the researchers produced carp families containing both mirror and fully-scaled brother and sister fish. Groups of fish from the same family, regardless of whether they were fully-scaled or mirror, had similar survival levels, indicating that scale coverage has no important role in protecting against KHVD. This finding is important since it implies that it will be possible to develop resistant carp lines that meet the preference of farmers to produce mirror carp. Lastly, the researchers compared the level of viral infection in several organs between resistant and susceptible fish. They found that resistant fish do get infected by the virus. However, while the level of virus infection in the bodies of susceptible fish rises dramatically and soon after leads to their mortality, the viral infection remains under control at a significantly lower level in resistant fish, allowing them to survive the disease. Therefore, resistant fish have a more effective immune system that allows them to combat the viral infection more successfully. Understanding what are these differences in the immune system that



make a fish resistant, not only will enhance our knowledge in fish immunology but will also direct development of better vaccines and potential drugs.

[Read the full article here](#)

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

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