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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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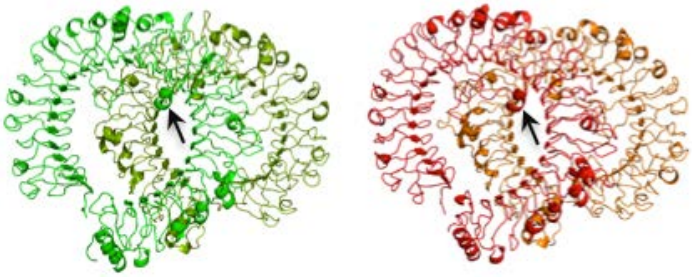
Fish can express recognition receptors not present in human and mouse

Toll-Like receptors (TLRs) play an important role in innate immune mechanisms that form the first line of defense against many invading pathogens. TLRs are an important group of receptors recognizing conserved motifs commonly present on/in important groups of pathogens. Recognition of these motifs by TLRs not only activates the innate immune system but also activates pathways important for acquired immunity. TLRs have typical horseshoe shapes and usually come in dimers (see picture). Like other vertebrate TLRs, the Toll-like receptors of teleost fish can be subdivided into six major families, each of which recognize a general but different class of pathogen-associated motifs from (Gram negative/positive) bacteria, (DNA/RNA) viruses and (protozoan/metazoan) parasites.



However, there also are a number of TLRs with unknown function, the presence of which seems unique to the bony fish. Their unknown function makes it much more difficult to identify the pathogen-associated motifs that would be recognized by these receptors. Researchers from the Cell Biology and Immunology group at Wageningen University, The Netherlands have studied the function of such a new receptor (TLR20), found in several fish species. Phylogenetic analyses place TLR20 in the TLR11 family, one of the major families which may be important for recognizing protozoan parasites. Carp TLR20 is mainly expressed in peripheral blood leukocytes with B lymphocytes, in particular, expressing relatively high levels of TLR20. Although in vitro reporter assays could not identify a motif unique to TLR20, in vivo infection experiments indicated a role for TLR20 in the immune response of carp to particular protozoan parasites.

From a practical viewpoint it is important to realize that TLRs are a receptor family considered extremely important for recognition of pathogens and building up of innate immunity. Some TLRs, especially those which seem unique to bony fish, may have new pathogen-associated motifs with undefined function. Further, TLRs are considered crucial modulators of protective immunity co-induced by adjuvants, normally present in many fish vaccines.

Read the full article

TargetFish 2nd Industry Workshop

The 2nd TargetFish Industry Workshop held during the 17th International Conference of the European Association of Fish Pathologists (EAFP) in Gran Canaria, Las Palmas in September 2015, where TargetFish

highlights and achievements were discussed, was a great success. The significance of these developments for the aquatic animal health industry and how they may be taken forward into commercial applications were discussed with representatives from both, Academia and Industry. A Workshop Report has just been published in the Bulletin of the European Association of Fish Pathologist

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