



## TargetFish Newsflash 7

**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.

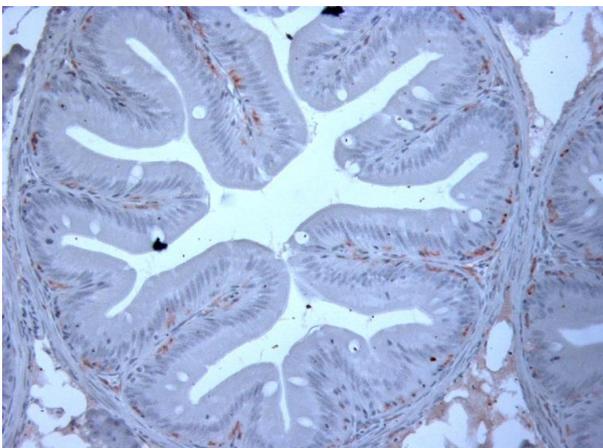
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### **Recruitment of leukocytes to the digestive tract of rainbow trout infected with, or orally vaccinated against, IPNV**

There are many details of how intestinal immunity is regulated that remain unsolved in finfish. Although leukocytes are present all along the digestive tract, most immunological studies have focused on the last segments of the gut. The importance of each separate segment in terms of immunity has barely been addressed.

IPNV is a viral pathogen important for salmonids and one of the few viruses for which oral vaccination appears to provide some level of protection. Researchers from INIA in Spain have studied the regulation of several immune genes along five segments of the rainbow trout digestive tract. They compared the response to infectious pancreatic necrosis virus to those elicited by oral vaccination with a DNA vaccine against this virus. They focused on the regulation of several chemokines and chemokine receptors in the mucosa. They also studied the recruitment of different leukocyte cell types to the different segments, using immunohistochemical techniques.



Infection with IPNV provoked a mobilization of two types of B lymphocytes (IgM<sup>+</sup> and IgT<sup>+</sup>) to the foregut and pyloric caeca region, and mobilization of T lymphocytes (CD3<sup>+</sup>) to the pyloric caeca and midgut/hindgut regions. Regulation of chemokine and chemokine receptor genes in response to both, infection and vaccination, can also be different along the different segments of the gut.

These results not only contribute to a better understanding of how mucosal immunity is orchestrated in the different segments of the gut, but also has practical outcomes. It clearly is important to consider which part of the gut to sample, if one would like to analyze infection with IPNV and/or protection provided by an (oral) vaccine. Further, measuring gene expression of chemokine and/or chemokine receptors could be useful as markers for protective immunity induced by oral vaccination.

*related to the recruitment of immune cells in the digestive tract of trout experimentally infected with infectious pancreatic necrosis virus (IPNV) or orally vaccinated.* Dev Comp Immunol. 2014 May;44(1):195-205.

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## TargetFish 2nd Industry Workshop

The 2nd TargetFish Industry Workshop held during the 17<sup>th</sup> International Conference of the European Association of Fish Pathologists (EAFP) in Gran Canaria, Las Palmas in September 2015 was a great success.



Two years onwards from the 1st TargetFish Industry Workshop in Tampere, Finland, we could highlight the achievement of a number of significant discoveries. Among the achievements discussed in Gran Canaria were the development of automated vaccination machines for small sized turbot or sea bass, but also progress on the development of prototype vaccines against Flavobacteriosis of salmonids and Nodavirus infections of sea bass. 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.

For more information, please please visit [www.targetfish.eu](http://www.targetfish.eu) or contact the

consortium via [targetfish.cbj@wur.nl](mailto:targetfish.cbj@wur.nl)

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**Website:** [targetfish.eu](http://targetfish.eu)

**Mail address:** [targetfish.cbj@wur.nl](mailto:targetfish.cbj@wur.nl)

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