

## Abstract 11:

Mucosal vaccination of fish: A whole body approach

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This project aims to develop novel mucosal vaccination strategies for warm water fish species. Vaccination is the most effective way to prevent and possibly eradicate diseases which affect aquaculture fish species. Currently, the most effective vaccines are generally delivered by injection, but this method is labour intensive, causes handling stress and is only viable for certain fish species at the right age. Therefore, mucosal vaccination by immersion or oral administration, targeting the gills, skin, intestines or olfactory organs, is preferred.

Mucosal vaccines have been shown to be effective if they mimic the natural route of infection, for example by crossing mucosal surfaces, and if they elicit strong and lasting immune responses. In order to achieve these requirements, this project aims to develop live-recombinant viral vectors and replicon particle vaccines, and to assess their efficacy as mucosal vaccines for fish. For a whole-body approach, we will use a variety of available transgenic zebrafish lines to select promising vaccine candidates and gain insight into the underlying mechanisms of protection. The use of zebrafish which are transparent and/or have labelled immune cells will allow us to investigate *in vivo* and in real-time the kinetics of vaccine uptake and immune cell activation. Promising vaccine candidates will further be used to provide proof-of-principle of their efficacy in commercially relevant species, carp and tilapia.

Altogether the project addresses knowledge gaps on mucosal immune responses and could provide a universal platform for mucosal vaccination of fish.