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## **THE ROLE OF THE GILLS AS POTENTIAL PORTAL OF ENTRY IN RAINBOW TROUT FRY SYNDROME**

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The Gram negative fish pathogen *Flavobacterium psychrophilum* is the causative agent of rainbow trout fry syndrome (RTFS), also known as BCWD (bacterial cold water disease). While injection-based experimental challenges with *F. psychrophilum* have been standardized and result in high mortality rates, the same has not been the case for immersion based models. However, injection is not a proper approach for investigations of the immune response since the first line of defense is bypassed. This study aims at understanding the immune response in the gills following infection as well as their possible role as portal of entry. A bath model, using hydrogen peroxide (H<sub>2</sub>O<sub>2</sub>) as a pre-treatment stressor to increase the number of infected fish, was used for sampling. The experimental setup consisted of four treatment groups; 1) untreated controls, 2) H<sub>2</sub>O<sub>2</sub>, 3) *F. psychrophilum* and 4) H<sub>2</sub>O<sub>2</sub> and *F. psychrophilum*. The use of this model also provides information regarding the impact of H<sub>2</sub>O<sub>2</sub> alone, though this was not the main objective. Samples were taken 4 hours, 2 days, 5 days and 8 days after infection and preserved for later processing. Two methods are employed in this study. Firstly, quantitative real-time PCR will be used to investigate the immune response in the gills after immersion exposure to *F. psychrophilum*. Secondly, fluorescent in situ hybridization will be used to visualize pathogen entry and spread in gills and head region. Samples are still undergoing analysis and results will be presented at the workshop.