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# **IMMUNE RESPONSE IN HEAD KIDNEY OF RAINBOW TROUT FRY FOLLOWING STRESS AND INFECTION WITH *FLAVOBACTERIUM PSYCHROPHILUM*.**

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The bacterial fish pathogen *Flavobacterium psychrophilum*, the cause of Rainbow Trout Fry Syndrome (RTFS), results in significant mortality in farmed rainbow trout; unless it is treated with antibiotics. Presently no commercial vaccine exists. More knowledge is required to elucidate the immune response in rainbow trout against *F. psychrophilum* in order to create preventive measures against RTFS. A limited number of studies have been carried out so far and have relied on samples from either naturally infected or injection-challenged fish. The use of naturally infected fish introduces many possible sources of error. Injection is a suboptimal approach for investigations regarding the immune response, since mucosal surfaces are bypassed. *F. psychrophilum* has a limited ability to cause disease in experimental bath challenges without applying a stressor. Recently, a bath model utilized H<sub>2</sub>O<sub>2</sub> before pathogen exposure to elevate mortality. The model was used to examine the immune response to infection in rainbow trout fry ( $\approx 1$  g); both with and without preceding H<sub>2</sub>O<sub>2</sub> treatment. Samples from the head kidney were taken before pathogen exposure and 4 hours, 48 hours, 125 hours and 192 hours after exposure. The regulation of several immune relevant genes was examined and the relative bacterial load was assessed. Although it is not determined how H<sub>2</sub>O<sub>2</sub> increases mortality, it is assumed to be due to stress. Exposure to H<sub>2</sub>O<sub>2</sub> prior to infection altered the regulation of several genes, and several correlations between pathogen load and gene expression were observed.