

# ***Aspects of the Atlantic salmon immune response during infection with the salmon louse, *Lepeophtheirus salmonis* 1837***

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## **ABSTRACT**

Atlantic salmon (*Salmo salar*) were experimentally infected with *Lepeophtheirus salmonis* copepodids and aspects of the host's immune response investigated. Copepodid secretory/excretory product (SEP) produced during early settlement was analysed using fast-protein liquid chromatography (FPLC), sodium dodecyl sulphate (SDS)-electrophoresis and zymography. Following establishment and the appearance of the chalimus stages, the expression of the chemokine interleukin-8 (IL-8) in the heart, spleen, head kidney, fins, liver and pyloric caeca was investigated using real-time (quantitative) PCR (qPCR). Furthermore, the secretions of *L. salmonis* chalimus were analysed for the presence of the prostanoid PGE<sub>2</sub> using commercially available enzyme-linked immunoassay (EIA) kits.

Analysis of copepodid secretory/excretory product suggested that any immunosuppressive component is not proteinaceous in nature. Whilst there was a definite increase in protein concentration of SEP relative to control SEP, further analysis using subtractive chromatographic analysis did not reveal any unique fraction present in either SEP or CSEP that was absent in the other. Interleukin-8 expression levels in tissues changed following *L. salmonis* infection, with heart and spleen showing significant increases in IL-8 gene expression, whilst the head kidney, fins, liver and pyloric caeca showed no significant increase. The increase in splenic IL-8 expression may be linked to its role as one of the major secondary lymphoid organs. However, this is the first record of increase in IL-8 expression in cardiac tissue. The secretions of *L. salmonis* chalimus were found to contain quantifiable levels of PGE<sub>2</sub>, albeit in highly variable quantities. This concurs with already published findings for adult *L. salmonis* (see Fast, *et al.* 2004). It is proposed that the chalimus states us the PGE<sub>2</sub> to modulate the hosts' immune response at the site of attachment and feeding.

**Key word:** Aquaculture, immunosuppressive, Endoplasmic reticulum, Parasitic antigens