Accepted Manuscript

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PII: S1050-4648(18)30363-2

DOI: 10.1016/j.fsi.2018.06.022

Reference: YFSIM 5365

To appear in: *Fish and Shellfish Immunology*

Received Date: 29 March 2018

Revised Date: 30 May 2018

Accepted Date: 11 June 2018

Please cite this article as: Attaya A, Wang T, Zou J, Herath T, Adams A, Secombes CJ, Yoon S, Gene expression analysis of isolated salmonid GALT leucocytes in response to PAMPs and recombinant cytokines, *Fish and Shellfish Immunology* (2018), doi: 10.1016/j.fsi.2018.06.022.

Gene expression analysis of isolated salmonid GALT leucocytes in response to PAMPs and recombinant cytokines

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Abstract

Increased knowledge of the immune response of the intestine, a physiologically critical organ involved in absorption, secretion and homeostasis in a non-sterile environment, is needed to better understand the mechanisms involved in the induction of long-lasting immunity and, subsequently, the development of efficacious gastrointestinal immunization approaches. To this end, analysis of isolated gut cells will give an insight into the cell types present and their immune capability. Hence, in this study we first optimised a method for salmonid gut leucocyte isolation and characterised the cells on the basis of their expression of a range of selected cell markers associated with T & B cells and dendritic cells. The GALT leucocytes were then stimulated with a variety of PAMPs, recombinant cytokines and PHA, as a means to help characterise the diversity of the immune repertoire present in such cells. The stimulants tested were designed to examine the nature of the antibacterial, antiviral and T cell type responses in the cells (at the transcript level) using a panel of genes relevant to innate and adaptive immunity. The results showed distinct responses to the stimulants, with a clear delineation seen between the stimulant used (eg viral or bacterial PAMP) and the pathway elicited. The changes in the expression patterns of the immune genes in these cells indicates that the salmonid intestine contains a good repertoire of competent immune cells able to respond to different pathogen types. Such information may aid the development of efficient priming by oral vaccination in salmonids.

Keywords

GALT leucocytes; Isolation; Salmonids; PAMPs; Recombinant cytokines; Gene expression