P-016.

Filifolinone, a natural compound with adjuvant effect for optimization of a commercial vaccine for IPNV

B. Modak [1,#,], B. Valenzuela [1,*], F. Soto [1], M. Parra [1], C. Vergara [1], M. Imarai [1].*

[1] Center of Aquatic Biotechnology, Faculty of Chemistry and Biology, University of Santiago of Chile, Av. Bernardo O'Higgins 3363, Santiago, Chile

Abstract

Filifolinone is a natural compound isolated from resin of *Heliotropium huascoense*, that increases the expression level of pro-inflammatory and anti-inflammatory cytokines in kidney cells of salmon. Given that cytokines are generated in response to the presence of pathogens, we have studied their potential adjuvant effect for the optimization of commercial vaccines against IPNV. In Chile, infectious pancreatic necrosis (IPN) is an endemic, prevalent, highly contagious and economically important disease, since it is widely distributed in Chilean salmon farms, causing heavy economic losses, in freshwater crops such as sea crops. The negative economic impact is directly related to the increase in losses due to mortalities, elimination of carrier breeders, progeny from carrier breeders, decrease in growth rates and increase in control measures. Among the control measures implemented, is the application of biosecurity measures, egg disinfection, individual incubation systems and application of vaccines. Currently, there is a wide variety of vaccines, however none of them has been efficient enough to control or eradicate the disease. Therefore, we evaluated the adjuvant effect of Filifolinone searching new strategies for control. In addition to mortality, its effectiveness was determined in terms of the presence of erratic swimming, anorexia and exophthalmia. Besides, we evaluated the presence of total IgM antibodies and the viral load in the anterior kidney in terms of VP2 gene expression.

keywords: Adjuvant activity, Filifolinone, IPNV,vaccine, antiviral activity.

Corresponding author. brenda.modaksach.cl

* These authors have contributed equally to this work.

P-017.

Cell surface markers for the identification of subpopulations of splenocytes from salmonids

B. Morales-Lange [1,], F. Guzmán [2,*], L. Lagos [3,*], M. Øverland [3,*], I. Nombela [4,*], M. Ortega-Villaizán [4,*], M. Imarai [5,*], K. Maisey [5,*], V. Wong [5,*], L. Mercado [1,#,*].*

[1] Grupo de Marcadores Inmunológicos en Organismos Acuáticos. Laboratorio de Genética e Inmunología Molecular. Instituto de Biología. Pontificia Universidad Católica de Valparaíso, Valparaíso, Chile

[2] Laboratorio de Síntesis de Péptidos. Núcleo Biotecnológico de Curauma. Pontificia Universidad Católica de Valparaíso, Valparaíso, Chile

[3] Department of Animal and Aquaculture Sciences, Faculty of Biosciences, Norwegian University of Life Sciences, Ås, Norway

[4] Instituto de Biología Molecular y Celular. Universidad Miguel Hernández (IBMC-UMH), Elche, España

[5] Laboratorio de Inmunología. Departamento de Biología, Universidad de Santiago de Chile, Santiago, Chile

Abstract

The phylogenetic development of the immune system shows that the adaptive response appears in fish. However the structure of this response and the antigen presentation process that coordinates the transit between the innate and adaptive immunity has been poorly characterized in teleost, due to the low number of phenotypic tools available for aquatic organisms. The spleen is a secondary lymphoid organ in fish and the present study aimed to identify subpopulations of splenocytes in salmonids that express molecules associated with the antigen presentation (CD83, CD86 and MHC II). For this, splenocytes were co-cultivated, activated or not by interferon gamma, with lymphocytes. The results indicated the existence of cells expressing surface molecules capable of presenting antigens to T lymphocytes. These cells, derived from splenocytes, increase the expression of surface molecules induced by interferon gamma and decrease their phagocytic capacity over time. Activation of these cell types *in vitro* shows that there is a tendency to activate populations of T cells (previously isolated with anti-CD4.1 and anti-IgM antibodies) to T regulatory lymphocytes. Further research is necessary to validate if the events here described also occur *in vivo*, to understand if the link between innate and adaptive immunity in fish has an inhibitory phase component, which could explain the absence of memory or the low protection capacity of vaccines used in aquaculture. This work was support by the Program for Sanitary Management in Aquaculture of the Ministry of Economy, Development and Tourism of Chile (FIE-2015-V014 201708070149) and by the Norwegian Research Council (281052). BML is a fellow of Advanced Human Capital Formation of CONICYT, Chile (21151176).

keywords: *Salmo salar*, *Oncorhynchus mykiss*, primary culture, flow cytometry, qPCR

Corresponding author.
E-mail address: luis.mercado@pucv.cl (L. Mercado).

* These authors have contributed equally to this work.

P-018.

Betanodavirus infection modulates European sea bass immune system at short-term

C. González-Fernández [1,#], E. Chaves-Pozo [2], M. Ángeles Esteban [1], A. Cuesta [1].

[1] Fish Innate Immune System Group, Department of Cell Biology and Histology, Faculty of Biology, Regional Campus of International Excellence "Campus Mare Nostrum", University of Murcia, 30100 Murcia, Spain

[2] Oceanographic Center of Murcia, Spanish Institute of Oceanography (IEO), Carretera de la Azohía s/n. 30860, Puerto de Mazarrón, Murcia, Spain

Abstract

Viral diseases are responsible for high mortality rates of several marine species and the associated economic losses on actual aquaculture. Special attention has been paid to *Nervous Necrosis Virus* (NNV), which affects many fish species and causes viral encephalopathy and retinopathy disease. Particularly, the European sea bass (*Dicentrarchus labrax*) is a very susceptible fish species to NNV and suffer mortalities up to 100% at larvae and juveniles stages. In this work, we aimed to evaluate the transcription of genes related to the cell-mediated cytotoxic activity (CMC), which is the main cellular immune response triggered by this virus, in different tissues of European sea bass. For this purpose, the virus was intra-muscularly injected to each individual and the effects upon NNV infection were evaluated in head-kidney and brain after 1, 7 and 15 days post-infection. Several immune-related genes were studied by real time PCR including those that code for interleukin (IL)−27 subunit beta-like (EBI3), the lymphocyte antigen 6-like secreted (SLURP1L), IL-12 beta subunit (IL12BA), the cytotoxic and regulatory T cell molecule (CRTAM) and the co-stimulatory receptor for the activation of naive T cells (CD28). In general, the expression of these genes were up-regulated after infection with NNV. Results of this study evidence that NNV modulate fish immune system at short-term (1 day post-infection). These findings suggest that CMC has an important role on immune response against virus-infected cells.

This work was funded by projects from MINECO and FEDER (AGL2016-74866-C3-1-R), the *Spanish Institute of Oceanography* (NODAMED) and