

Immune response of vaccinated juvenile gilthead seabream (*Sparus aurata*) after LCDV-Sa infection

Rocío Leiva-Rebollo, Juan G3mez-Mata, Juan J. Borrego, Dolores Castro, Alejandro M. Labella

Departamento de Microbiolog3a, Instituto de Biotecnolog3a y Desarrollo Azul (IBYDA), Universidad de M3laga, 29071 M3laga, Spain

Lymphocystis disease is one of the main viral pathologies affecting cultured gilthead seabream (*Sparus aurata*) in the Mediterranean area. Although the mortality rate of affected fish is low, the economic impact for hatcheries is remarkable due to the impossibility of marketing affected specimens showing the characteristic external lesions. In our group, a DNA-vaccine has been developed based on the major capsid protein (MCP) of the Lymphocystis Disease Virus 3 (LCDV-Sa). The aim of the present study is the evaluation of immune-related gene expression in vaccinated fish after viral infection to identify immunogenes involved in the vaccine-induced protection. To fulfil this objective an OpenArray® platform has been developed to study 49 genes related to the immune response. Reference and viral genes were also evaluated. Gilthead seabream specimens (5 g mean weight) were distributed into 3 experimental groups, inoculated with the vaccine at 0.1 µg/g fish dose, the empty plasmid at the same dose or PBS. Thirty days post-vaccination, fish were intramuscularly injected with the virus at 10⁶ TCID₅₀/fish dose. Samples of head-kidney, spleen, intestine and caudal fin from 6 fish were individually collected at 1, 2 and 3-days post-injection in all groups. The quantification of viral DNA in fins of fish challenged with LCDV-Sa were carried out by a qPCR assay targeting a viral structural gene (putative myristoylated membrane protein, MMP) alternative to the *mcp* gene contained in the vaccine. The results obtained showed an increase of genes deregulated within the haematopoietic organs between vaccinated and non-vaccinated fish. However, in the intestine and fin, the results showed the opposite trend. The global effect of fish vaccination was a diminished immune response compared to non-vaccinated fish, being 83 and 99 genes differentially expressed through the experiment, respectively. Moreover, viral replication decreased in groups of fish previously vaccinated. The modulation of the immune response provoked by the vaccination trial seems to control the progression of the disease. This research was funded by the Junta de Andalucia and FEDER under Grants P12-RNM-2261 and UMA20-FEDERJA-076.