INFLUENCE OF VIRAL RE-INFECTION ON TRANSCRIPTOMES OF DISEASE RESISTANT AND SUSCEPTIBLE EUROPEAN SEA BASS *Dicentrarchus labrax, L.* CHALLENGED WITH NERVOUS NECROSIS VIRUS

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Introduction

Fish viral infections have great environmental and economic implications in aquaculture. In the Mediterannean, the most significant disease in terms of severity, economic impact and spread, is *viral nervous necrosis (VNN)*. The disease is caused by *nervous necrosis virus (NNV)*, which is a pathogen causing high mortality and morbidity. The first step to move forward on the battle against the NNV disease is to fully understand its progression and its effect on the host. Aim of the present work is to study how *NNV re-infection* affects the *European sea bass (Dicentrarchus labrax, L.) transcriptome*, in one disease resistant and one disease susceptible sea bass family. To determine how each family responds to re-infection, we performed RNA-sequencing analysis to assess differential gene expression in brain and head-kidney tissues of experimentally NNVinfected *D. labrax*.

Material & Methods
NNV infected (1) NNV infected (2)



Functional enrichment analysis - GOs Brain





Total RNA extraction: TRIzol (Invitrogen)

RNA-sequencing kits: Ion Total RNA-Seq Kit v2 kit/Ion 540[™] Chip Kit (ThermoFisher Scientific)

Sequencer: Ion S5[™] Sequencer

Bioinformatic analysis: OmicsBox - Bioinformatics made easy (Version 3.2.9). BioBam Bioinformatics.

Results – Differentially Expressed Genes (DEGs)



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Brain

Conclusions

- Genes de-regulation caused by infection is intense both in fish brain and head kidney.
- Resistant and sensitive families have very different patterns of gene de-regulation.
- Resistant family has more down-regulated enriched GO categories compared to the sensitive family, indicating a less intense response to the virus for both fish brain and head-kidney.
- Signaling GOs were highly de-regulated in all cases.
- Immune processes GOs down-regulation was enriched in the brain but both up- & down-regulated in the head-kidney by infection.
- Resistant family utilizes mediated transport, up-regulating genes in the head-kidney and down-regulating genes in the brain.
- More pathways are enriched in head-kidney compared to brain in all cases.

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