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in rainbow trout. What other genes do they regulate? Which host cells are responsive to the cathelicidins? Are myxozoan parasites susceptible to the cathelicidins?

To begin answering these questions, we produced recombinant rainbow trout cathelicidins (rtCath1 and rtCath2). We will confirm the proper function of the recombinant cathelicidins in *in vitro* antimicrobial activity assays. Rainbow trout host cells will be enriched via density centrifugation (e.g., red blood cells) and/or sorted (e.g., head kidney B cells). The different subpopulations will be exposed to the recombinant peptide to measure what immune genes are regulated by the cathelicidins. Finally, we will explore their antiparasitic activity on myxozoan parasites.

Overall, we will provide new information on the broad-spectrum activity of the cathelicidins, elucidate their roles in host responses and determine if they offer protection against diseases such as PKD.



Antimicrobial peptide Dicentracin shows prophylactic and therapeutic actions against NNV infections in European sea bass

Laura Cervera^{1,2}, Marta Arizcun², **Elena Chaves-Pozo**², Alberto Cuesta¹
¹University of Murcia, Murcia, Spain, ²COMU-IEO, CSIC, Mazarrón, Spain

Introduction: Nodavirus (NNV) is one of the most prevalent pathogens in the Mediterranean Sea, causing viral encephalopathy and retinopathy disease to many fish species such as European sea bass (*Dicentrarchus labrax*), causing great mortality rates in larvae and juvenile stages. Antimicrobial peptides (AMPs) are low molecular weight, cationic and amphipathic peptides with dual functions: direct lytic effects against a wide range of pathogens, including viruses, and modulating the immune response of the host. Very scarce studies have focused on the antiviral role of AMPs in fish, but with positive results. Therefore, we aimed to evaluate the immunological actions of the European sea bass AMP Dicentracin (Dic) as well as its potential application as preventive or therapeutic agent against NNV infections.

Methodology: To reach our aim, we designed three experiments using sea bass juveniles: i) administered with Dic-encoding plasmids and then challenged with NNV; ii) administered with synthetic Dic peptide and then challenged; or iii) challenged with NNV and then administered with synthetic Dic peptide. Control samples were always included. In all cases, samples of head-kidney, muscle and serum were sampled in order to evaluate the immunological response as well as the mortality and clinical signs.

Results: Dic peptide administration resulted in a significant increase of the sea bass survival upon NNV infection either as preventive or as therapeutic treatment. Priming of the immune response was higher with the synthetic peptide than with the Dic-plasmid.

Conclusions: Dic peptide exerts more potent immunomodulatory actions when administered as synthetic peptide than by plasmids. Dic peptide showed partial protection against NNV infection in European sea bass, pointing to this peptide as a potential tool to prevent and control NNV outbreaks in fish farms.

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The susceptibility of shi drum to betanodavirus depends on the rearing densities

Carolina Johnstone¹, José María García-Beltrán^{2,4}, Teresa Pérez-Sánchez¹, Fernando Méndez², Marta Arizcun², Alberto Cuesta³, Montse Pérez⁴, **Elena Chaves-Pozo**²
¹COMA-IEO, CSIC, Fuengirola, Spain, ²COMU-IEO, CSIC, Mazarrón, Spain, ³University of Murcia, Murcia, Spain, ⁴COV-IEO, CSIC, Vigo, Spain

Introduction: The diversification of species in aquaculture requires the continuous study of animal welfare parameters and the susceptibility to pathogens. An inadequate welfare state results in stress, poor health and increased severity of infectious diseases. In fact, several stress conditions have been related with increased mortalities and betanodavirus (NNV) spread. The shi drum (*Umbrina cirrosa*) has attracted attention due to its good growth rates and great adaptability to culture conditions together with a great flesh quality. However, this species is susceptible to the four genotypes of NNV and displays stress behavior at high rearing densities.

Methodology: In order to determine the response of shi drum upon NNV infection at different stressed conditions, specimens reared at low or high density were experimentally infected. A transcriptomic study was performed comparing the gene expression pattern of several tissues of infected and non-infected specimens from the group showing mortalities. The presence of NNV in the gonad of survivors was analyzed.

Results: The mortalities observed were low but only occurred at the group reared at high density. The transcriptomic study showed that the number of tissue-specific genes expressed increased in head-kidney, liver and brain, and