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keywords: Nervous necrosis virus (NNV), immune system, *Dicentrarchus labrax*, PCR

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P-019.

CpG oligodeoxynucleotides modulate innate and adaptive functions of IGM+ B cells in rainbow trout

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Abstract
Oligodeoxynucleotides (ODN) containing unmethylated CpG motifs have been widely postulated as vaccine adjuvants both in mammals and teleost fish. However, to date, the effects that CpGs provoke on cells of the adaptive immune system remain mostly unexplored in fish. Given that rainbow trout (Oncorhynchus mykiss) IgM+ B cells from spleen and blood transcribe high levels of toll like receptor 9 (TLR9), the receptor responsible for CpG detection, in the current work, we have investigated the effects of CpGs on both spleen and blood IgM+ B cells from this species. CpGs were shown to exert strong proliferative effects on both spleen and blood IgM+ B cells, also increasing their survival. The fact that CpGs increase the size of IgM+ B cells, reduce the expression of surface IgM and IgD and upregulate the number of IgM-secreting cells strongly suggest that IgM+ B cells differentiate to plasmablasts / plasma cells in response to CpG stimulation. Additionally, CpGs were
shown to modulate the antigen presenting capacities of trout IgM+ B cells through an
increased surface MHC II expression and transcriptional up-regulation of co-stimulatory molecules, although in this case, significant differences were observed between the effects exerted on spleen and blood cells. Similarly, differences were observed between spleen and blood IgM+ B cells when CpG stimulation was combined with B cell receptor (BCR) crosslinking. Finally, CpGs were also shown to affect innate functions retained by teleost IgM+ B cells such as their phagocytic capacity. These results demonstrate that CpGs regulate many adaptive and innate functions of teleost B cells, supporting their inclusion as adjuvants in novel vaccine formulations.
keywords: Rainbow trout, CpG, IgM, B cells, BCR.

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P-020.

Insights into the functions of piscidins in the European sea bass (*Dicentrarchus labrax*)

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ABTRACT
Antimicrobial peptides (AMPs) are one of the host's first line of defenses against a wide range of infectious agents. Apart from the antimicrobial activity, AMPs are known to influence other biological processes, such as immunomodulation and iron metabolism. Fish present a specific group of AMPs, the piscidins. These peptides have been characterized in several fish species, acting on multiple pathogens, being also altered when fish are subjected to an infection. Furthermore, several studies have shown the potential of using synthetic peptides to promote fish survival upon infection. However, in the European sea bass (*Dicentrarchus labrax*), a commercially important fish produced in aquaculture, only hepcidin has been extensively characterized. Thus, a comprehensive study on the functions of other AMPs, particularly piscidins, is missing. Here, we identified and characterized the different piscidins of sea bass. We evaluated the antimicrobial activity of piscidins against several bacteria known to cause massive mortalities in cultured marine fish. Furthermore, the expression of the different genes belonging to the piscidin family was assessed under distinct experimental conditions, particularly infection and iron modulation, at pre-determined time points. Our results show a diverse piscidin antimicrobial activity *in vitro* against the different bacteria, indicating that these AMPs have a direct role against these pathogens, depending on the pathogen and piscidin peptide. Our data also shows a piscidin response after infection, suggesting that piscidins are involved in the response against infection. Furthermore, preliminary data shows that piscidins also respond to iron modulation, indicating that these AMPs may have other yet undisclosed functions asides antimicrobial activity, such as a role in iron metabolism. Our findings imply that piscidins might be a complementary or alternative way that fish possess to deal with this essential element, apart from the major iron regulator hepcidin. It is known that iron is also essential for bacterial progression during infection. Thus, iron is in a continuous regulation to be available for body processes, being also modulated to ensure that is inaccessible to pathogenic microorganisms. Further work is necessary to fully understand the role and mechanisms of action of piscidins under the context of immune response and iron metabolism regulation, and to possibly uncover a novel function for these particular peptides in fish.
keywords: Antimicrobial peptides; Piscidins; Sea bass (*Dicentrarchus labrax*); Infection; Iron metabolism

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P-021.

Effects of 17α-ethynylestradiol (EE2) on the immune system of Juvenile European sea bass with a special focus on B and T cells

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Abstract
Synthetic compounds are known for their persistence and bioaccumulation in the environment. 17α-ethynylestradiol (EE2), a synthetic derivative of the natural hormone oestradiol, is present in human contraceptive pills, but also in livestock and aquaculture activity. Therefore, municipal wastewaters are one of the most important sources of this compound in the aquatic environment. Because EE2 induces oestrogenic effects even at trace level concentration, it has potent endocrine disrupting