modulation by the melatonin hormone, we hypothesized that changing photoperiod influences the fish immune functions through the modulation of melatonin synthesis. The study thus investigated the effects of two natural photoperiod regimes simulating the fall and the spring in western Europe on melatonin secretion, stress and immune markers.
Daily cyclic activities were observed for plasma melatonin and cortisol, but also for several innate immune markers, including lysozyme, peroxidase and complement activities in plasma and phagocytic activity in spleen. Nocturnal plasma melatonin values were influenced by the seasonal simulated photoperiods with progressive increase or decrease for the photoperiods simulating the fall and the spring respectively. No photoperiod effect was detected on cortisol release. Moreover, the exposure to the fall-simulated photoperiod induced several effects on immune markers, including increases in lysozyme, peroxidase and complement activities. Analyses of immune-relevant gene expression are ongoing. Our results bring an additional evidence supporting the potential immunomodulatory action of the melatonin hormone in teleosts with a stimulation of the innate immunity following the increase in melatonin production in response to the fall-simulated photoperiod.
Keywords: Melatonin; photoperiod; immune system; circadian axis; pikeperch

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O-024.

Modifications of mucosal and systemic antibody repertoire after ERM nasal vaccination in rainbow trout

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Abstract
Bony fish have a dedicated mucosal immune system which comprises immunologically heterogeneous microenvironments armed with innate and adaptive immune components. In rainbow trout (*Oncorhynchus mykiss*), a nasopharynx-associated lymphoid tissue (NALT) was recently described as a diffuse network of myeloid and lymphoid cells located in the olfactory organ of fish. Teleost NALT presents IgM and IgT B cells in equal proportions and nasal mucus contains secreted IgM and IgT. Several studies have demonstrated that nasal vaccination is a very effective mucosal route to stimulate adaptive immune responses and high levels of protection against viral and bacterial pathogens in fish. However, the mechanisms underlying the observed protection are not well understood. We applied a barcoded 5′RACE IgH cDNA sequencing approach to investigate the structure of the systemic and mucosal rainbow trout immunoglobulin repertoire. Its analysis in control trout suggests different structures of IgM and IgT spleen and NALT repertoire, with restricted repertoire diversity in NALT. Nasal and intraperitoneal vaccination with enteric red mouth (ERM) vaccine also revealed unique dynamics of IgM and IgT repertoires at systemic and mucosal sites and the remarkable ability of nasal vaccines to induce spleen Ig responses. Our findings provide an important immunological basis for the effectiveness of nasal vaccination in fish and other vertebrate animals and will help the design of future nasal vaccination strategies.
Keywords: NALT, B cells, Immunoglobulin, Repertoire, Vaccine.

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O-025.

Under control: 20 IRAK3 variants regulate toll-like- and interleukin-1-receptor signalling in rainbow trout

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Abstract
The immune system of vertebrates enables the rapid and very efficient defence against microorganisms and viruses. Shortly after the detection of pathogens, amplifier mechanisms multiply various destructive activities, which may, however, also be directed against the host itself. An arsenal of inhibitory factors controls therefore the duration and extent of the immune response, restricts pathological events and restores homeostasis. For these reasons, it is essential that endogenous immune regulators are integrated in efficient health concepts in aquaculture.
However, immune inhibitors in teleost fish are still poorly explored, also due to the fact that the teleostean repertoire of immune inhibitors is more complex than the mammalian one. We found that the inhibitory kinase interleukin-1 receptor-associated kinase 3 (*irak3*) is present in more than 20 isoforms of varying length and nucleotide composition in rainbow trout. We elucidated the underlying genetic causes for this striking Irak3 diversity and profiled the expression of all *irak3* variants in healthy and infected rainbow trout. The obtained data revealed that the truncated *irak3* variants are expressed to a much greater extent than the full-length variants. The overexpression of selected full-length and truncated Irak3 variants in different cell models showed that the individual isoforms modulate the basal as well as the pathogen-induced activity of NF-kappaB with different efficiency. Confocal microscopy showed that the overexpression of the truncated Irak3 variant was associated with massive cell death, in contrast to the full-length variant. Based on these different observations, we assume that the multiple Irak3 variants do not represent sheer abundance. Rather, we hypothesize that different Irak3 variants could integrate specificly into the different cascades mediated by IL1R1 and more than a dozen TLRs. Certain Irak3 isoforms might suppress the inhibitory functions of their paralogs to steer the immune response from a suppressed to a reinducible state. Further analyses are on the way to test the hypotheses using suitable cell models and appropriate knock-out or knock-in techniques.
Keywords: Inhibitory factors; Innate Immunity; IRAK-3; Salmonids; Toll-like receptor signalling

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O-026.

Evidence of IgD-secreting plasmablasts and mucosa specific IgD molecular signatures in teleost gills and gut

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Abstract
IgD is an ancient immunoglobulin for which many aspects of its regulation and function remain unclear. Although usually expressed on the surface of