

Evaluation of immunomodulatory properties of anisaxin A-2S, an antimicrobial peptide for use in aquaculture

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**Institute lecture hall
October 24, 2024,
at 10 AM**



ReC-IMI



Colloquium of the Institute for Medical Research and Occupational Medicine

Lecture title: Evaluation of immunomodulatory properties of anisaxin A-2S, an antimicrobial peptide for use in aquaculture

Lecturer: Anush Arakelyan, PhD, Institute of Parasitology, Biology Centre, CAS, Czech Republic

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Abstract

Anisaxins are membranolytic, cecropin-like antimicrobial peptides produced by zoonotic nematodes of the genus *Anisakis*, known for their efficiency against multi-drug-resistant Gram-negative bacteria and negligible cyto-/genotoxicity towards the host. However, other potentially interesting bioactive properties of anisaxins, such as their immunomodulatory properties, have not yet been characterized. In this study, we evaluated the immunomodulatory properties of anisaxin-2S (A-2S) on common carp (*Cyprinus carpio*) blood cells exposed to two fish pathogens. The assessment was carried out in vitro and in vivo for the parasite *Sphaerospora molnari*, while assessments for the bacterium *Aeromonas hydrophila*, were limited to in vitro conditions. The expression of cytokines (il-1 β , il-6, il-10, tnfa, and infg) and reactive oxygen species (ROS) production were measured over time. The results show that A-2S exerts an immunostimulatory effect on fish blood cells by upregulating cytokine expression, with the pro-inflammatory or anti-inflammatory response conditioned by the presence or absence of a co-stimulatory antigen. The powerful antimicrobial activity, coupled with immunostimulatory properties warrant further pursuing of preclinical trials.

Curriculum Vitae

Anush Arakelyan has a PhD in Biology with over 10 years of experience as an Ichthyologist, specializing in fish taxonomy, ecology, conservation, and fish farming. Extensive expertise in trout breeding, environmental monitoring, and fish restocking. Currently working as a Postdoctoral Researcher at the Institute of Parasitology, Biology Centre, CAS, focusing on nanoencapsulated antimicrobial peptides and their application in aquaculture, as well as testing nanoparticles for human applications.

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