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Bela-Ong, Dennis; Schyth, Brian Dall; Lorenzen, Niels

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RHABDOVIRUS-INDUCED FISH-SPECIFIC MICRORIBONUCLEIC ACIDS IN RAINBOW TROUT (*ONCORHYNCHUS MYKISS*)

Dennis Berbulla Bela-ong[1, 2]*, Brian Dall Schyth[1], and Niels Lorenzen[2]

[1]Section for Immunology and Vaccinology, National Veterinary Institute,
Technical University of Denmark, Bulowsvej 27, DK-1870 Frederiksberg C, DENMARK

[2]Fish Health Section, Department of Animal Sciences
University of Aarhus, Hangøvej 2, DK-8200 Århus N, DENMARK

*Corresponding author: Tel: +45 35886814 Fax: +45 35886901
Email: debo@vet.dtu.dk; Dennis.Bela-ong@agrsci.dk

The fish rhabdovirus, *Viral hemorrhagic septicemia virus* (VHSV), causes significant mortality in farmed fish. The potential threat from wildlife marine reservoir of VHSV to sea-farmed rainbow trout (*Oncorhynchus mykiss*) demands disease protection measures. Identification of biomarkers during infection is important to understand the complex web of interactions involved in the underlying host response, which is needed to develop effective disease control strategies. Microribonucleic acids (miRNAs) are important regulators of biological processes, including responses to pathogens, while some miRNAs have been demonstrated to possess direct antiviral effects. We have observed and validated that miR-462 and miR-731, miRNAs which to date, has been described only in fish, were among the most highly expressed miRNAs in rainbow trout liver following VHSV infection and in the liver and muscle of fish intramuscularly injected with a DNA vaccine encoding the VHSV glycoprotein gene. The two miRNAs were further shown to be induced in fish intramuscularly injected with a type I interferon (IFN) construct and the general IFN stimulator and TLR-3 agonist, poly I:C, suggesting that the increased levels of the these miRNAs at the site of administration is associated with type I IFNs. In order to investigate the potential role(s) of miR-462 and miR-731 in host-pathogen interactions, we designed synthetic oligonucleotides called antagomiRs or anti-miRNAs to silence the two miRNAs. These antagomiRs were injected intraperitoneally into rainbow trout fingerlings followed by exposure of fish to VHSV. Development of disease and levels of infection were analyzed and compared to data from fish treated with control anti-miRNAs. Further analysis of the effect of anti-miRNA treatment in cell culture is underway.

Emails: Dennis Bela-ong (debo@vet.dtu.dk; Dennis.Bela-ong@agrsci.dk);
Brian Dall Schyth (bdschyth@gmail.com); Niels Lorenzen (Niels.Lorenzen@agrsci.dk)

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