Do microRNAs induced by Viral Hemorrhagic Septicemia virus in rainbow trout (Oncorhynchus mykiss) possess anti-viral activity?

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Do microRNAs induced by V*iral Hemorrhagic Septicemia* virus in rainbow trout (*Oncorhynchus mykiss*) possess anti-viral activity?

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Microribonucleic acids (miRNAs) are small (18-22 nucleotides) endogenous RNAs that potently regulate the deadenylation, translation, and decay of a wide spectrum of target mRNAs. Their discovery adds a new layer to the mechanisms of control of gene expression, impacting a broad range of biological processes. Some miRNAs have been shown to have direct anti-viral effects.

We have previously observed and validated that the fish-specific miRNAs, miR-462 and miR-731, were among the most highly expressed miRNAs in rainbow trout liver following *Viral hemorrhagic septicemia virus* (VHSV) infection. These miRNAs were also up regulated in the liver and muscle (vaccination site) of fish vaccinated with a DNA vaccine expressing the VHSV glycoprotein gene. Recent studies further indicate that the expression of these miRNAs is induced by interferons.

In order to analyze if miRNA-462 and miRNA-731 have any anti-viral effects, we designed inhibitory synthetic oligonucleotides called antagomiRs or anti-miRNAs. These saline-formulated 2'-O-methylated Locked Nucleic Acid (LNA)-based antagomiRs were injected intraperitoneally into rainbow trout fingerlings followed by exposure of the fish to VHSV. Development of disease and levels of infection will be analyzed and compared to data from fish treated with control miRNAs.

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