

Generation and characterization of novel DNA aptamers against coat protein of grouper nervous necrosis virus (GNNV)**Lingli Zhou**

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Generation and characterization of novel DNA aptamers against coat protein of grouper nervous necrosis virus (GNNV): Nervous necrosis virus (NNV) infected larvae and juveniles of more than 50 fish species, resulting in mortality rates of greater than 95%. However, there is no efficient method to control NNV infections. Aptamers generated by selective evolution of ligands by exponential enrichment (SELEX) are short, single stranded nucleic acid oligomers. They display a high degree of affinity and specificity for many targets, such as viruses and viral proteins. In this study, three novel DNA aptamers (A5, A10 and B11) that specifically target the coat protein (CP) of grouper nervous necrosis virus (GNNV) were selected using SELEX. Secondary structures and minimum free energy (ΔG) predictions indicated that these aptamers could form stable, secondary stem-loop structures. Electrophoretic mobility shift assays, enzyme linked immunosorbent assays, *K_d* measurements, the co-localization of tetramethylrhodamine (TAMRA) labeled aptamers with the CP and flow cytometry analysis revealed that these aptamers could specifically bind the CP with high (nanomolar) affinities. Moreover, all three aptamers did not show any cytotoxic effects *in vitro* or *in vivo* and anti-viral analysis indicated the selected aptamers could inhibit NNV infection *in vitro* and *in vivo*. TAMRA labeled aptamers could bind to NNV virions and directly enter NNV infected cells, suggesting they could be used as tracers to study the mechanism of viral infection, as well as for targeted therapy. This is the first time that aptamers targeting a viral protein of marine fish have been generated and characterized. These aptamers hold promise as diagnostic, therapeutic and targeted drug delivery agents for controlling NNV infections.

Biography

Lingli Zhou is currently a PhD student from University of Chinese Academy of Sciences with particular direction in Marine Virology. She is interested in antiviral research of virology and aptamer selection using SELEX. She holds a Master's degree in Biochemistry and Molecular Biology from China University of Geosciences.

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