

Evaluation of Highly Targeted dsRNA for the Treatment of Infectious Myonecrosis Virus (IMNV) in *Litopenaeus vannamei*

A.S. Leaflet R2669

Lyric Bartholomay, associate professor; D. L. (Hank) Harris, professor

Summary and Implications

Double stranded RNA was synthesized *in vitro* with sequences corresponding to portions of the IMNV genome and were injected into shrimp 2 days after a lethal challenge with IMNV. This is the first time these methods have been used to treat IMNV infections in shrimp.

Introduction

Infectious myonecrosis virus (IMNV) is a non-enveloped, double stranded RNA (dsRNA), member of the *Totiviridae* family that causes severe disease and economic losses in commercially raised shrimp. Currently, there are no available vaccines or therapeutics for IMNV. This experiment analyzes the effects of IMNV RNAi on mortality caused by IMNV.

Materials and Methods

Specific Pathogen Free (SPF) juvenile *L. vannamei* weighing 5 grams were acquired from Shrimp Improvement Systems (SIS) and were acclimated into 200L tanks

containing synthetic seawater. Animals were divided into 3 groups with 3 replicates per group and 10 animals per tank. Shrimp were challenged with a lethal dose of IMNV by intramuscular injection into the third abdominal segment using a previously clarified and diluted tissue homogenate positive for IMNV by PCR. Shrimp were then injected 2 days later with 5 micrograms of dsRNA81, dsRNAeGFP, or an equivalent volume of 2% sterile saline. Mortalities were recorded and dead or moribund animals were removed for further diagnostic testing (Figure 1).

Results and Discussion

After 20 days, significant differences ($P < .05$) were noted between dsRNA81 treated animals and dsRNAeGFP or 2% saline controls using ANOVA followed by Tukey's multiple comparison test using JMP 9 software. No significant differences were evident between animals injected with dsRNAeGFP or the 2% saline control. This demonstrates that specific dsRNA can therapeutically treat IMNV in a sequence dependent manner, and may provide a method to treat disease caused by IMNV.

Figure 1. Survival Curves Following IMNV Challenge and Treatment.

