Anti-viral immunity in the shrimp *Litopenaeus vannamei*: dissecting the role of RNA interference

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RNA interference (RNAi) is a form of posttranscriptional gene silencing whereby double-stranded RNA (dsRNA) molecules trigger the sequence-specific degradation of cognate mRNA by an RNA-induced silencing complex (RISC). The biological importance of RNAi is underscored by its wide conservation throughout metazoans and also by emerging evidence indicating that RNAi and related pathways function in many fundamental biological processes, including antiviral defense, development or maintenance of genomic stability.

In the Pacific white shrimp *Litopenaeus vannamei*, our recent work has established, for the first time in a marine invertebrate, that the injection of dsRNA induces an innate antiviral immunity acting in a sequence-independent manner, but also that virus-specific dsRNA evokes a powerful and specific immune response. These results imply the existence in the shrimp of an intact RNAi machinery, which could act as a natural mechanism of antiviral defense.

Using large scale EST collections from the Pacific white shrimp and a candidate gene approach (degenerate primers), we have identified several genes that correspond, based on their sequence homology, to different components of the RNAi pathway in vertebrates and invertebrates. We therefore aimed at investigating their *in vivo* implication in this mechanism by developing a reverse genetic approach (using dsRNA) to knock down their expression, a method also called RNAi of RNAi.

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