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## **Expression profiles of two downstream signalling molecules of toll-pathway in tiger shrimp (*Penaeus monodon*), cactus and dorsal genes in response to infection with white spot syndrome virus and *Vibrio harveyi***

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Shrimp aquaculture industry has faced severe economic losses due to devastating diseases affecting shrimp especially white spot syndrome (WSSV) and vibriosis which caused massive mortality in many species of penaeid shrimp. In order to generate protection strategies against diseases, it is essential to gain better understanding of the defense system of shrimp. Innate immunity is the first-line of defense in shrimps. Previously, we characterised MyD88 and TRAF6, two innate immune genes in the Toll pathway of *Penaeus monodon* and studied the response of these genes against WSSV challenge both *in vivo* and *in vitro* which revealed that Toll-pathway in *P. monodon* responds to WSSV infection. Dorsal (NF-kappa B homolog) and Cactus (IkB homolog), two downstream signalling molecules in the Toll-pathway have been characterised from *Litopenaeus vannamei* and *Fenneropenaeus chinensis* showing varied antibacterial/antiviral response. In the present study, the temporal expression profiles of Dorsal and Cactus from tiger shrimp, *P. monodon* in response to white spot syndrome virus (WSSV) and *Vibrio harveyi* was studied in post-larvae and selected tissues of juvenile of *P. monodon* after immersion challenge as well as upon injection in adult shrimp. Moreover, the response of these genes was also studied upon WSSV challenge *in vitro* in primary haemocyte cultures of *P. monodon*. *Pm* Cactus and *Pm* Dorsal displayed varying expression pattern in response to immersion challenge with WSSV in PL-18 and most of the tested tissues of juveniles. However, complete down-regulation of *Pm* Dorsal could be noticed in hepatopancreas at all time points. Upon injection, *Pm* Cactus expression was up-regulated in haemocytes and lymphoid organ at most of the time-points tested. Peak up-regulation was observed at 24 hours post-infection for both gill and midgut. *Pm* Dorsal expression was up-regulated in haemocytes and gill at all time-points. However, up-regulation was noticed only at few time-points for both lymphoid organ and midgut. *Pm*Cactus and *Pm*Dorsal showed up-regulated expression in response to WSSV at early time-points tested, 6 hours and 2 hours respectively *in vitro* in primary haemocyte cultures. Similarly, varied temporal expression pattern of these immune-relevant genes could be noticed upon challenge with *Vibrio harveyi*. The modulation of expression of these genes in response to WSSV *in vivo* as well as *in vitro* and *V. harveyi in vivo* suggests their possible role in immune responses in shrimp against viruses as well as bacteria.

### **Biography**

Deepika Anand is currently an PhD student in Central Institute of Fisheries Education, India.

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