

Heparan sulfate is a potential receptor for VP37 of white spot syndrome virus

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Abstract :

VP37 of White Spot Syndrome Virus (WSSV) is believed to be an viral envelope protein responsible for the attachment of WSSV to shrimp hemocytes. However, the shrimp molecule that is targeted by VP37 is still unknown. Here in this study, we demonstrated through ELISA assay that the binding of VP37 to shrimp hemocytes could be prevented by soluble sulfated galactan (SG) extracted from red seaweed (*Gracilaria fisheri*). This observations allowed us to hypothesize that VP37 might be able to recognize SG-like molecules presented on the surface of shrimp hemocytes. Since there is a report on the presence of heparan sulfate (HS) in shrimp tissues, we then performed Surface Plasmon Resonance (SPR) analysis to investigate the binding of VP37 to HS. Our SPR analysis showed that VP37 strongly bound to HS with the binding affinity of 1 μ M. Interestingly, it was also shown through SPR assay that the binding of VP37 to HS could be blocked by SG. This prompted us to propose that the attachment of WSSV on shrimp tissue is mediated by the binding of VP37 to HS presented on the surface of shrimp tissue and that prevention of this interaction by SG can help reduce infectivity of WSSV in shrimp as previously seen in other previous studies.

Keywords : WSSV, VP37, Heparan-like glycosaminoglycans