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Interaction between Kazal-Type Serine Proteinase Inhibitor SPIPm2 and Cyclophilin A from the Black Tiger Shrimp Penaeus monodon

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Abstract : A Kazal-type serine proteinase inhibitor, SPIPm2, was abundantly expressed in the hemocytes and secreted into shrimp plasma has anti-viral property against white spot syndrome virus (WSSV). To discover the molecular mechanism of antiviral activity, the binding assay showed that SPIPm2 bind to the components of viral particle and shrimp hemocyte. From our previous report, viral target protein of SPIPm2 was identified, namely WSV477 using yeast two-hybrid screening. WSV477 is an early gene product of WSSV and involved in viral propagation. In this study, the co-immunoprecipitation technique and Tandem Mass Spectrometry (LC-MS/MS) was used to identify the target protein of SPIPm2 from shrimp hemocyte. The target protein of SPIPm2 was cyclophilin A. In vertebrate, cyclophilin A or peptidylprolyl isomerase A was reported to be the immune suppressor interacted with cyclosporin A involved in immune defense response. The recombinant cyclophilin A from Penaeus monodon (rPmCypA) was produced in E.coli system and purified using Ni-NTA column to confirm the protein-protein interaction. In vitro pull-down assay showed the interaction between rSPIPm2 and rPmCypA. To study the biological function of these proteins, the expression analysis of immune gene in shrimp defense pathways will be investigated after rPmCypA administration.

Keywords : cyclophilin A, protein-protein interaction, Kazal-type serine proteinase inhibitor, Penaeus monodon
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