Abstract

Shrimp exhibit a diverse response to viral infection, that is manifested in drastic up- and down-regulations of a variety of genes. In our previous work, we identified syntenin of the shrimp *Penaeus monodon* (Pm) as a dynamic responder to White Spot Syndrome Virus (WSSV) infection, its message being greatly upregulated in the acute phase of the infection. In order to further explore the link between Pm-syntenin and viral infection, we performed a yeast two-hybrid screening of a *P.monodon* cDNA library, using Pm-syntenin as bait. One of the molecules that specifically interacted with Pm-syntenin was the receptor-binding domain of alpha-2-macroglobulin (α_2M). A GST pull-down assay showed that GST-α_2M, but not GST alone, was capable of co-precipitating syntenin. Another GST pull-down assay showed that GST-syntenin, but not GST alone, was capable of co-precipitating α_2M. In addition, mutant analyses showed that the N-terminal 131 amino acids of syntenin were both necessary and sufficient to bind the C-terminus receptor-binding domain of α_2M. Furthermore, WSSV-infected Pm showed a significant upregulation of the α_2M message, suggesting that both syntenin and its protein partner α_2M are upregulated in the acute phase of a WSSV infection. Taken together with a previous report showing the co-localization of α_2M and syntenin in the exosome of a dendritic cell line, it is likely that syntenin, through its interaction with α_2M, plays an important role in the immune defense mechanisms of viral infections of shrimps.

Key words: Syntenin; Alpha-2-macroglobulin; Yeast two-hybrid; Immune; White Spot Syndrome Virus