Characterization of white spot syndrome virus(WSSV) structural protein VP41B(ORF298)

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ABSTRACT

White spot syndrome virus (WSSV; genus Whispovirus, family Nimaviridae) is a widely occuring virus which attacks cultured shrimp and many other crustaceans and has caused severe mortalities and huge economic losses to the shrimp farming industry globally. WSSV is a large enveloped DNA virus. The protein components of the WSSV virion have been established and at least 58 structural proteins are currently known. In this study, a novel WSSV structural protein, VP41B (WSSV-TW ORF298) was characterized. vp41B is composed of 903 bp encoding a polypeptide of 300 aa with a theoretical mass of 41 kDa. Recombinant VP41B (r41B) was expressed and antibody against r41B was successfully produced. Western blot analysis of viral protein fractions suggested that VP41B is a viral envelope protein. Membrane topology assay demonstrated that the VP41B is located on the inner surface of envelope. Yeast two-hybrid assays revealed that VP41B associated directly with other 12 WSSV structural proteins and most of them are envelope proteins. VP41B is also with self-association activity forming several types of polymer. VP41B can also interact with 3 Penaeue monodon receptor proteins, including pmCBP, pmRACK1, and F1 ATP synthase beta subunitbeta subunit beta subunit. The above data suggest that the VP41B may be important in virion assembly and play a role in cell recognition, as well as in attaching the virus to the cell.

Keywords : WSSV、VP41B、structural protein、protein interaction

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