

# Study on the antiviral mechanisms of lactoferrin against white spot syndrome virus

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## ABSTRACT

White spot syndrome virus (WSSV) is an important pathogen affecting cultured shrimp. To date there is no effective method to treat this disease caused by WSSV. Lactoferrin (Lf) is a multifunctional glycoprotein that is important in immune regulation and defense mechanisms against bacteria, fungi and viruses. Our previous research demonstrated that bovine Lf (bLf) treated shrimp are resistant to WSSV infection. In the present study, experiment performed on *Autographa californica* multiple nucleopolyhedrovirus (AcMNPV) and Sf9 insect cells and showed that bLf also interferes in AcMNPV infection. bLf treatment induced high level expression of certain immune-related genes in shrimp. Immunofluorescence assays demonstrated bLf was detected both in the nucleus and on the cell surface of bLf treated Sf9 cells and the hemocytes from bLf treated shrimp. Immunoelectromicroscopy, Far-Western blot and immunoprecipitation assays showed that the bLf was able to bind to the viral particle surface, and possibly via interaction with envelope proteins VP28. These results imply that the anti-viral effects of bLf on WSSV may be involved in multiple mechanisms, including upregulation of immune related gene expression, competing with WSSV to bind host cell surface molecules, and associating with viral particles to directly interfere in their the targeting on host cells.

Keywords : White spot syndrome virus、lactoferrin、shrimp、anti-viral effects

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