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Identification of a novel host protein SINAL10 interacting with GP64 and its role in *Bombyx mori* nucleopolyhedrovirus infection

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Highlights:

- 1 Eight host proteins were identified as binding partners of GP64.
- 2 SINAL10 interacts with GP64 through the receptor binding domain.
- 3 SINAL10 can promote BmNPV proliferation.

ABSTRACT

Bombyx mori nucleopolyhedrovirus (BmNPV) is the most important pathogen of *Bombyx mori*, silkworm and causes severe losses in the silk industry. During the virus infectious cycle, budded virus (BVs) and occlusion-derived virus (ODVs) particles, which have identical genetic content but different phenotypes, are produced. The envelope glycoprotein GP64, specific in BVs, is involved in host cell receptor binding and is sufficient to mediate membrane fusion during the viral entry. However, the host cell factors, interacting with GP64 to mediate BVs infection, are still unknown. In this study, a cDNA library of *Bombyx mori* cells (BmN) was constructed and yeast two-hybrid screening was used to identify the host cell factors interacting with GP64. One of the eight candidate proteins encoded the E3 ubiquitin-protein ligase SINA-like 10 (SINAL10), was further confirmed through coimmunoprecipitation assays as novel GP64 binding protein. Moreover, overexpression of SINAL10 significantly enhances