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Herpesvirus Tegument and Immediate Early Proteins are Pioneers in the Battle between Viral Infection and Nuclear Domain 10-related Host Defense

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Running title: Herpesviruses Use Tegument and Immediate Early Proteins to Counteract ND10

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Highlights

- The three herpesvirus subfamilies incorporate tegument proteins to suppress the nuclear domain 10-related repression of the viral genome.
- Each type of herpesvirus discussed in this article contains at least one immediate early protein to disrupt ND10, and their mechanisms are not exactly the same.
- Nuclear domain 10 targets pre-replication sites of herpesviruses by recognizing specific factors for viral DNA replication, but not the incoming viral genome.

Abstract

The sophisticated anti-viral functions of nuclear domain 10 (ND10) are revealed by identifying the role of each component and the countermeasures applied by viruses. Several ND10 proteins suppress herpesviruses at initial and early phases of infection. Herpesviruses need to antagonize these anti-viral proteins to start a productive infection. In this review the recently identified similarities and differences among the strategies adopted by the three subfamilies of herpesviruses are discussed, highlighting that one of the significant purposes of incorporating tegument proteins into the viral particles might be to counteract ND10 proteins immediately after the viral genome enters the host nucleus. Once the infection progresses, a sufficient amount of immediate early proteins is expressed to disperse and hydrolyze ND10 proteins, accelerating the development of infection.

Keywords: Herpesvirus; Nuclear domain 10; Tegument protein; Immediate early protein