

Abstract

This work focuses on interactions between small DNA viruses and PML NBs. PML NBs are membrane-free nuclear bodies that contain, permanently or transiently, more than 170 proteins. The permanent ones include, e.g., the PML, Daxx, and Sp100 proteins. Many PML NB proteins are subjected to SUMOylation. In addition to functions in regulating apoptosis and gene expression, chromatin remodelling, and DNA damage responses, they are also involved in antiviral cell defence. On the other hand, viruses have developed strategies to thwart the restrictive effects of PML NBs, or even to misuse some of their components to support the infection. Apparently, PML NBs play a significant role in some viral infections, but models of such processes are still incomplete and sometimes controversial. Some adenovirus proteins interact with PML NB components to prevent the negative effects of PML NBs on transcription and replication. In contrast, papillomavirus genomes can be protected by PML NBs from degradation upon entry into the nucleus and during transcription. For polyomaviruses, both promoting and restriction functions have been published. In Chicken anaemia virus infection, the interaction of the viral apoptin and PML led to the induction of cell apoptosis, but the results were questioned. In patients with chronic hepatitis, during radiotherapy, the proximity of PML and Hepatitis B virus genomes has been found to promote virus reactivation.

Keywords: PML nuclear bodies, SUMOylation, Daxx, Sp100, small DNA viruses, restriction factor