Abstract

The Smc5/6 complex is an eukaryotic protein complex that, together with Smc1/3 cohesin and Smc2/4 condensin, is involved in ensuring genome stability. It contributes to this by participating in the organization and maintenance of chromosomal structures as well as in the response to DNA damage. In addition, the Smc5/6 complex has been shown to play an important role in viral infection. This thesis focuses on the mechanisms of interaction of the Smc5/6 complex with viral DNA genomes, DNA intermediate genomes and viral proteins. In the case of HBV of the *Hepadnaviridae* family, Smc5/6 acts as a restriction factor. The same is true for HSV-1 of the *Herpesviridae* family, viruses of the *Papillomaviridae* family and HIV-1 of the *Retroviridae* family. An interaction of the Smc5/6 complex with the JC virus of the *Polyomaviridae* family has also been discovered. Nevertheless, the meaning of this interaction remains elusive. Some of the above-mentioned viruses can prevent this restriction. In detail, HBx protein of HBV mediates proteasomal degradation of the Smc5/6 complex or Vpr protein of HIV-1 induces degradation of the SLF2 protein, which is responsible for the Smc5/6 localization on HIV-1 DNA intermediate genomes.

Keywords: Smc5/6 complex, DNA repair, ATPase, sumoylation, DNA viruses, viruses with a DNA intermediate genome, inhibition, restriction factor