**DNA tumor viruses and their role in the development of epithelial tumor**

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**Background:** Among agents that play an important and often causative role in tumor development there are DNA tumor viruses. Especially, human herpesviruses, such as Epstein-Barr virus (EBV), Kaposi sarcoma virus (HHV8), Herpes virus Saimiri (HVS), and Marek’s disease virus (MDV) are involved in malignant cell transformation. The same is true for small DNA tumor viruses, exemplified by Simian virus 40 (SV40), adenoviruses, and Human papilloma viruses (HPV), though mechanisms of cell transformation are different.

**The aim** of the present work is to summarize the current knowledge on molecular mechanisms of cell transformation, that serves as background for development of the treatment of cancer disease.

**Topics overviewed:** i) a short presentation of the DNA tumor viruses and associated diseases; ii) the mechanisms of inactivation of the two major cellular pathways – RB and TP53 by various DNA tumor viruses upon malignant cell transformation; iii) own data on the role of EBV-encoded nuclear antigens EBNA-3, EBNA-5, and EBNA-6 in cell transformation.

**Conclusions:** based on the research of mechanisms of malignant cell transformation by the high-risk HPV the anti-cancer vaccine was developed. For other tumor viruses this path is still opened.