

Abstract

Vaccinia virus (VACV) is an enveloped DNA virus belonging in the Orthopoxviridae genus. It is a laboratory virus in which the natural host and exact origin remain unclear. However it is of great significance for human kind. First of all, different VACV strains were used for preparation of vaccines used in the smallpox eradication campaign. Even today a significant effort is made to prepare more efficient and safer vaccines against smallpox, namely because of still remaining concerns that variola virus – causative agent of smallpox – could be misused as a biological weapon. Advances in genetic engineering allowed use of VACV for additional purposes, namely as a vaccination and expression vector. VACV enables insertion of large pieces of foreign DNA into its genome and expression of this DNA in a host. Furthermore VACV replicates exclusively in a cytoplasm, decreasing a risk of incorporation of the viral DNA into the host genome. These and other features make VACV an ideal candidate as a vector for preparation of recombinant vaccines against various infectious and oncological diseases. This thesis provides a summary of both clinically used and experimental vaccines derived from VACV.