

Safe model of HIV infection to assess antiretroviral activity of medical drugs

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Abstract

The aim of the investigation is to develop the safe model of HIV infection to assess the efficacy of antiretroviral drugs. Materials and methods. The HIV infection model was designed on the basis of human cell culture and recombinant lentivirus carrying the gene of green fluorescent protein (gfp). Recombinant lentivirus has the structure of 1 type HIV (HIV-1) from which genomic RNA was removed from using genetic engineering method. Cell provirus integration was assessed by gfp gene expression. By means of the model the activity of known medical drugs used for HIV infection treatment was determined. Results. The model simulates three stages of HIV-1 cycle: reverse transcription, pre-integration complex formation and its delivery to the nucleus, provirus integration into cell genome. Nucleoside (Zidovudine and Lamivudine) and non-nucleoside (Efavirenz) inhibitors of reverse transcriptase effecting at the stage of HIV reverse transcription, significantly suppressed provirus integration into human cell genome, while fusion inhibitor (Enfuvirtide) and HIV protease inhibitor (Atazanavir) did not have such an effect as they act only at later stages not represented in the model. Conclusion. The suggested model can be used not only for pharmaceuticals testing but also for screening new modalities of having an effect on human cells including gene therapy.

Keywords

Antiretroviral drugs, Cellular model, HIV infection, Lentivirus factor