

## **Efficiency and mechanism of antitumor activity of cardiolipin-like lipid/thymidine kinase gene HSV-tk lipoplexes in the presence of gancyclovir**

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### **Abstract**

The herpes simplex virus thymidine kinase/gancyclovir (HSV-tk/GCV) system is studied as cytotoxic lipoplex based on cardiolipin-like dicationic lipid CDL-I. It is proposed to be used as nonviral gene transfer system in cancer gene therapy protocols. An efficient transfection of MCF7 and HEC293 cell lines with this lipoplex was earlier demonstrated. Non-viral system based on the CDL-I/HSV-tk lipoplex and gancyclovir treatment causes efficiently death of tumor cells with an involvement of apoptosis key stages. It was proved that depolarization of mitochondrial membrane and increased level of NF- $\kappa$ B transcription factor take place as a response to CDL-I/HSV-tk lipoplex action followed by gancyclovir treatment. It suggests an early involvement of apoptosis mitochondrial way to an action of this certain «suicide» system, delivered using dicationic lipid.

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### **Keywords**

«Suicide» herpes simplex virus thymidine kinase gene system, Apoptosis, Cancer gene therapy, Dicationic lipids, Gancyclovir, NF- $\kappa$ B transcription factor, Non-viral of gene transfer systems