

Oncolytic Activities of Viruses Polio1, ECHO1, Coxsackie B2 on Cell Cultures and Xenografts of Anaplastic Oligodendroglioma and Anaplastic Oligoastrocytoma

A.O. Zheltukhin¹ and A.I. Afremova²

^{1,2}Engelhardt Institute of Molecular Biology, Russian Academy of Sciences,
ul. Vavilova 32, 119991 Moscow, Russia
E-mail: ¹aozheltukhin@gmail.com

Abstract—There has been a significant progress in fight of malignant neoplastomas, but the treatment of brain tumors is still a serious problem, and the risk of relapse is still high. One can therefore conclude that the search for new alternative therapies is highly relevant. One of this approach could be based on the applying of oncolytic viruses, based on the ability of many viruses selectively infect and destroy cancer cells. The aim of this study was to investigate the oncolytic properties of attenuated vaccine strains of enterovirus - poliovirus type 1 (Polio1), viruses ECHO1 and Coxsackie B2 in cell lines, derived from biopsy samples of malignant tumors of the brain, such as anaplastic oligodendroglioma WHO grade III and anaplastic oligoastrocytoma WHO grade III. All of the three viruses showed significant cytotoxicity against that cell lines by plaque assay, but for poliovirus type 1 cytotoxicity was much higher. Further, for poliovirus type 1 was investigated significant decrease volume of orthotopic brain xenografts in immunodeficient mice, obtained from cell cultures, mentioned above. In addition, postmortem immunohistochemical staining of sections of xenografts by specific antibodies to viral proteins showed the presence of viral antigens, what confirms the direct oncolytic action of poliovirus type 1. These findings suggest that use poliovirus type I is very promising approach in treatment of brain cancer. This work was supported by the Ministry of Education and Science of the Russian Federation under the grant agreement № 14.607.21.0014 from 05.06.2014, the unique identifier of the project - RFMEFI57714X0033.

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