Секция «Вирусология»

Flowcytometric monitoring of the oncolytic recombinant vaccinia virus infection in different cell lines

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Oncolytic virus therapy is a novel platform of treating metastatic cancer. Oncolytic viruses infect and destroy cancer cells without any harm to normal tissues, also, they stimulate immune system against tumor cells [1]. Recombinant vaccinia viruses have great prospects as an antitumor agent, due to its large capacity of genome, high onco-selectivity and proven high safety profile. Monitoring of virus titers and cell physiology during propagation is an importance step of the characterization and optimization process of oncotherapy [2]. Flow cytometry is a valuable tool to investigate the effects of culture conditions and process variations on virus replication and virus yields through specific period of time [3]. In this study, Modified Vaccinia Ankara (MVA) and a strain from Leningrad Institute of viral preparations (LIVP) been used to develop recombinant variants that express reporter construct with red fluorescent protein (RFP) and firefly luciferase. Cell lines of 4T1 breast cancer, CT26 carcinoma, B16 melanoma and baby hamster kidney (BHK) were cultured and been infected with different multiplicity of infection (MOI), and the kinetics of virus been observed through 12, 24, 48 and 72 hours after infection. A significant increase in titer was detected at the earliest 12 to 24 h post infection. These *in vitro* results compared with kinetics of the virus in *in vivo* test, after inoculation of these model cell lines into mice. To measure infection kinetics *in vivo*, strains expressing firefly luciferase been used through IVIS spectrum [4].

References

1) Breitbach CJ, Lichty BD, Bell JC. Oncolytic viruses: therapeutics with an identity crisis. EBioMedicine (2016) 9:31–6.10.1016.
2) The oncolytic poxvirus JX-594 selectively replicates in and destroys cancer cells driven by genetic pathways commonly activated in cancers. Mol Ther (2012) 20:749–58.10.1038/mt.2011.276.
3) Rieseberg Marco, Kasper Cornelia, Reardon Kenneth F, Scheper Thomas. Flow cytometry in biotechnology. Appl. Microbiol. Biotechnol. 2001; 56:350–360.
4) Luciferase Imaging of a Neurotropic Viral Infection in Intact Animals. J. Virol. 2003; 77:5333–5338.