Секция «Вирусология»

Colon cancer cell lines can vary significantly in susceptibility to the antiviral effects of type I interferon

Научный руководитель – Чумаков Пётр Михайлович

Le Thi Hoa
PhD
Московский физико-технический институт, Москва, Россия
E-mail: lehoa@yandex.ru

Oncolytic viruses are a promising anticancer agent due to their ability to selectively infect and kill cancer cells [1, 2]. In recent years, enteroviruses have been considered as candidates for cancer treatment, since this large family of viruses uses several alternative cellular receptors to enter the cell, which may partially determine their ability to infect tumor cells on which the corresponding receptor is expressed in sufficient quantities [3]. The sensitivity of tumor cells to oncolytic viruses can be determined by many factors, such as the quantity of cell surface receptors expressed on tumor cells, the mechanism of vesicular transport, activity of endocytosis, factors involving to the timely release of viral components from endosomes, and initiation of the processes of translation and replication of viral RNA [4]. However, an important factor for the success of viral infection is the state of the immune system against viral infections and the ability of cells to respond to treatment with type I interferons [5]. In tumor cells, these systems are usually damaged, but the degree of suppression can vary.

The purpose of this work was to determine the ability of seven strains of oncolytic enteroviruses to exert a cytopathic effect on two colon cancer cell lines (CaCo2 and LIM1215) 16 hours after treatment with 1000 units/mLof interferon-α, compared to untreated control cells.

The results showed significant differences in the ability of cells of these lines to defend themselves against viral infection after treatment with interferon-α. While LIM1215 cells showed high sensitivity to interferon, CaCo2 cells indicated a significant suppression of their response to interferon treatment.

References

1) Kaufman H. L., Frederick J. K., Andrew Z. Oncolytic Viruses: A New Class of Immunotherapy Drugs // Nature reviews. Drug discovery. 2015, V.14(9). P.642–662
2) Voroshilova M. K. Potential use of nonpathogenic enteroviruses for control of human disease // Prog Med Virol. 1989, Vol.36. P.191 –202.
3) Chumakov P.M., Morozova V.V., Babkin I.V., Baikov I.K.,Netesov S.V., Tikunova N.V. Oncolytic enteroviruses. Mol. Biol. 2012, V.46(5). P.639–650.
4) Singh Prafull K, Juwar Doley, Kumar G. R., Sahoo A.P. and Ashok K. T. Oncolytic viruses & their specific targeting to tumour cells // Indian J Med Res. 2012, 136(4). P. 571–584.
5) Charles E. Samuel. Antiviral Actions of Interferons // Clin Microbiol Rev. 2001, 14(4). P.778–809.