Influence of holographic information copies on growth activity, the viability of cell lines and the reproduction of the influenza virus

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Modern approaches to the selection of drugs are primarily focused on the safety of the drug, since side effects can have a damaging effect on the human body. This dictates the need to search for such agents that have a therapeutic effect without disrupting the metabolism of cells and the whole organism. One of these means are medical holographic energy-information copies (GIC) of biophysical properties of biologically active substances using laser radiation [1]. In this work, we studied the influence of the GIK

series Z (Z_{one}, Z_2, Z_3) on the growth activity and viability of cell lines, as well as the reproduction of the influenza virus in them.

A ferret brain nerve cell line (Mpf) and monkey kidney cells (Vero E6) were used in the experiments. For the cultivation of Mpf cells, a DMEM nutrient medium was used, for Vero E6 cells, an Eagle MEM medium supplemented with 10% fetal calf serum (ETS, Biolot), 10 mM α-glutamine, and 50 μg / ml lincomycin. The cells were incubated at 37 ° C in
thermostat with CO_2 in culture flasks (mattresses) with a volume of 50 ml. The proliferation index (PI) was determined as the ratio of the number of grown cells to the number sown. Cell viability (in%) was assessed by staining them with a 0.4% trypan blue solution and counting living cells in a Goryaev chamber. The morphology of the cultures was studied by staining the cell preparations with hematoxylineosin. Determination of mycoplasmas was carried out by staining cells with DNA-specific fluorochrome olivomycin, followed by examination of the preparations in a luminescent microscope.

We used the H3N2 influenza virus (strain A / Aichi 1/68). GIK
used in the form of plates: Z_{one} commonly used for homeopathic and antihelminthic therapy; Z_2 with fungal infections; Z_3 possesses antiviral effect (flu, herpes) [2]. Holograms courtesy
provided by Egorochkin AND.The.

Experiments on the Mpf cell line were carried out with a suspension of cells in a nutrient medium DMEM, a suspension of cells at a concentration of 100,000 cells / ml was placed in a foam vial in front of a vertically standing mirror, then a laser was brought, in another version, a laser with a hologram, pressed 20-25 times on button of the laser, directing the beam through the liquid to the mirror so that the beam is reflected back onto the cell suspension, after which the cells were scattered onto mattresses and cultured in a nutrient medium. Viability and proliferation index (PI) were determined on days 2–3, we found that laser exposure to Mpf cells led to a decrease in growth activity (PI = 1.7 and 2.4 on days 2 and 3, respectively) compared with the control (PI = 2.8-3.0).

When using hologram Z_{one} there was a slight increase in PI to 3.7–4.0. The morphology of cells in the control and in the experiment practically did not differ.

Thus, exposure to the laser resulted in cell damage,
however, with their subsequent restoration in the course of growth. GIK Z_{one} increases the growth activity of Mpf cells to control values.

In further experiments, the GIK Zone and Z2. As a result of these experiments, it was found that when passaging Mpf cells with a laser and GIK Zone up to 5-6 passages, there is an increase in growth activity up to PI = 5.9-6.0. Upon further passaging of cells with GIK Z2 cell proliferation decreased slightly to PI = 4.6–4.0. Morphological studies showed that the morphology of cells and nuclei practically did not differ from the control. A complete monolayer and active cell division are observed.

In the variant with the effect of one laser on the Mpf cells, the visual morphology of the cells changed insignificantly. However, reseeding the cells irradiated with a laser led to the 11th passage, which resulted in a decrease in the growth activity of cells to PI 2.5 and <2.0, followed by degeneration of the monolayer, and subsequently the cells irradiated with a laser were not passaged.

In the second series, the experiments were consistently used GIK Z2 and Z3. It was found that, as in previous experiments, consistent the use of holograms is also a led to an increase in PI before 5.6-6.0 s slight decrease proliferative activity in process passaging (up to IP = 4.6-4.9).

Thus, on the basis of these experiments, it can be concluded that for nerve cells of the ferret brain (Mpf), laser exposure for 10 passages leads to an insignificant change in cell morphology and inhibition of growth activity. The use of holographic information copies Zone, Z2, and Z3 does not cause morphological changes and a decrease in proliferative activity and cell viability.

Considering the positive results, it seemed appropriate to study the effect of holograms on the viability and morphology of another type of transplanted cells - the kidneys of the green monkey (Vero E6), contaminated with mycoplasma. Since the contamination of cells with mycoplasmas has a significant effect on the state and functioning of cells in cultures, we set up experiments to study the effect of the hologram GIK Z3 for the content of mycoplasmas. For this purpose, 3 passages of Vero cells were performed E6 with this hologram.

As in experiments with Mpf cells, GIK enhances the growth activity of Vero E6 cells in comparison with the control after 1 passage. With further passaging, the PI reached the control level (PI = 3.9-4.0).

However, morphological examination revealed degeneration of the cell cytoplasm, as well as nuclear disintegration, which indicates a greater sensitivity to the effects of monkey kidney cells (Vero E6) compared to ferret brain cells (Mpf).

Study of the effect of holograms on mycoplasma contamination showed that the holograms Zone, Z2 and Z3 do not suppress their development in cells.

The next stage of work was to study the action of the hologram Z3, used as an antiviral agent in vivo, when experimental influenza infection in vitro. The research objective was clarification of the action of the GIK Z3 when exposed to cells 1 hour before infection with the H3N2 influenza virus (strain A / Aichi 1/68), i.e. study of its preventive action, and 24 hours after infection (therapeutic action). For this purpose, laser-treated and GIK Z3, and control cells were plated into 24 wells

panels (by Costar). After the formation of a monolayer, the influenza virus was introduced in a dose 100 TCD_{fifty}/cl.

Experiments have shown that exposure to the GIK Z_3 on the Mpf cell culture before infection with the H3N2 influenza virus does not suppress the multiplication of the virus in cells, i.e. does not have a prophylactic effect. Titers of gemaglutinin are practically the same as in the control. When processing cells infected
virus, after 24 hours by laser and GIK Z_3 there is a complete suppression of the reproduction of the virus.

Thus, the impact of the laser GIK Z_3 experimental influenza infection in vitro leads to complete suppression
influenza virus in cell culture, with a therapeutic effect.

We have previously shown that bioresonance electromagnetic radiation using the "MINI-EXPERT-T" apparatus of the "IMEDIS" company completely suppressed the reproduction of the H3N2 influenza virus (strain A / Moscow 10/99) in the kidney cells of the dog MDSK [3].

That is, an exogenous bioresonance effect using the Imedis apparatus or a directional hologram leads to suppression of the H3N2 influenza virus multiplication in cell cultures and may well be recommended for use as a therapeutic agent for influenza infection.

Literature

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