# Study of the influence of the composition of the geroprotector "Leyurus Arctic +" on cell cultures and on the human body

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Recently, special attention has been paid to biological products containing all the microelements necessary for the vital activity of the human body. They should not only be active, bioavailable, but also not toxic to humans. One of the most amazing biological products is the preparation "Arctic +", created on the basis of bioregulators isolated from the larvae of the long-lived mollusk "pearl mussel" Margaritifera margaritifera, symbiotes of the gills of the salmon Salmo salar in combination with the healing renal secretion of male stickleback Gasterosteus aculeatus. The drug is an aqueous sterile solution of bioregulators in an ultra-low concentration corresponding to $10^{-12}$ mg protein / ml, in distilled water (colorless transparent liquid). The secretion of the cells of the exocrine glands of these ageless aquatic organisms contains the amino acid composition of protein and peptides of 19 proteinogenic amino acids.

A preliminary analysis of the pearl mussel secretion showed that the "symbiont parasite" secretes a water-soluble substrate containing amino acids, peptides, and glycopeptides into the host's blood. Pearl oyster larvae are able to turn off the aging program of salmon, prolonging its longevity. And the kidney secretion of the male stickleback fish is able to recognize healthy and defective cells of eggs laid by the female and destroy mutant cells.

A number of studies and observations have revealed a positive therapeutic effect when using this drug. Tests carried out on salmon fish with epithelioma showed an increase in the survival rate of fry up to 89–96% when using the drug in comparison with the control group, where the survival rate was only 7–11%. Studies carried out on mice inoculated with Ehrlich's ascites carcinoma showed a significant increase in the life expectancy of sick mice treated with the drug "Arktika +" [1–4].

Developing this direction, the drug was improved by adding homeopathic doses of an extract from red sea urchin caviar. The Japanese consider sea urchin caviar the basis of health and longevity, it increases immunity, normalizes the work of the cardiovascular system, increases potency in men and libido in women.

One of the important stages in the study of drugs is the study of their cytotoxic effect on cell cultures. The study of the effect of the drug "Leyurus Arctic +" on the cell culture was carried out on transplanted Vero cells (green monkey kidney cells). For cell cultivation, we used standard nutrient media Igla MEM produced by the Moscow Institute of Poliomyelitis and Viral Encephalitis. M.P. Chumakov. The culture medium was supplemented with 10% fetal calf serum (FBS) from PanEco.

In order to study the effect of the heteropreparation "Leyurus Arctic +" on the growth activity and viability of Vero cells, 3 samples were taken:

# 1. control variant: pure Vero cell line.

# 2. experimental version: Vero cells with the addition of 1 ml of the preparation "Leyurus Arctic +" No. 3; option: Vero cells with the addition of 1 ml of bidistilled water.

Sample No. 3 was taken for comparison with experimental samples No. 2.

The seeding dose of cells for each of the studied samples was 266 thousand cells / ml. (viability (W) - 92%). The cells were cultured in culture plastic

vials for 72 hours in a thermostat at a temperature of 37.0 ° C.

Growth activity was determined by the proliferation index (PI), i.e. in relation to the number of grown cells to the number of seeded. Cell viability was determined as a percentage by counting living cells per 100 examined by staining them with trypan blue. The morphology of the cells was investigated by staining the cells grown on coverslips with azure-eosin according to Romanovsky in a light microscope (OK. 10 x rev. 40). The results of the study are presented in table. 1.

Table 1

Growth activity of Vero cells under the influence of the drug "Leyurus Arctic +"

| Vero cells | Proliferation index | Cell viability |
|---|---|---|
| No. 1 cell Vero-Control | 2.7 | 94% |
| No. 2 of Vero cells with Leyurus Arctic + " | 2.65 | 93% |
| No. 3 Vero cells with bidistilled. water | 2.1 | 70% |

As you can see, the cell proliferation index (PI) in the experimental sample No. 2 with the Leyurus Arctic + preparation was practically the same as in the control sample No. 1 with a pure Vero cell line, and amounted to 2.65 in the experiment and 2.7 in control. Cell viability was 93% and 94%, respectively. In sample No. 3 with Vero cells and the addition of distilled water, the PI was lower - 2.1, and the cell viability was 70%. The morphology of the cells of all three samples differed little from each other: the cells were not changed, the monolayer was even. Thus, the Leyurus Arctic + geropreparation did not decrease the growth activity and cell viability as compared to the control.

Doctors of the "IMEDIS" center analyzed the effect of the biological product "Leyurus Arctic +" on 52 patients aged 25 to 82 years with confirmed diagnoses. When analyzing the results of testing by the ART method "IMEDIS-TEST" in the overwhelming majority of subjects over the age of 40, there was a decrease in the level of growth hormone, imbalance of thyroid hormones, disorders of the parathyroid glands, in women - of the gonads.

When the biological product "Leyurus Arctic +" was added to the measurement circuit with an extract of red sea urchin caviar, the indicators in most cases returned to normal, or there was a tendency toward their normalization (Table 2)

table 2

The results of testing the biological product "Leyurus Arctic +" by the EPD method at various violations

| Violations, identified in examination by ART method | Decrease immunity | RRP Low | Violation functions thyroid growth glands | Violation hormone | Violation genital glands |
|---|---|---|---|---|---|
| General number | 52 | 6 | 48 | 51 | 28 |
| Recovery to normal | 51 | 5 | 44 | 47 | 24 |
| Trend towards normalization | 1 | 1 | 3 | 4 | 2 |
| Left without changes | - | - | 1 | - | 2 |

When observing patients in the course of treatment, there was an improvement in well-being, elimination of symptoms such as fatigue, apathy, bad mood, improved skin condition and muscle turgor, and puffiness disappeared. As experience has shown, the biological product "Leyurus Arctic +" possessed not only a wide spectrum of medico-biological activity, but also good tolerance.

Thus, the drug "Leyurus Arctic +" is low-toxic and is able to provide a positive therapeutic effect in various pathological conditions.

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