# ACTUAL PHARMACOLOGICAL BIOTECHNOLOGICAL INNOVATIONS TO IMPROVE THE QUALITY OF PATIENT'S LIFE THERAPEUTIC AND SURGICAL PROFILE

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**Modern effective drugs which are obtained by using biotechnological genetic engineering methods presented in this article. The main use in surgical and therapeutic clinical practice presents: modern recombinant probiotic generation V Subalin, which was synthesized by Ukrainian scientists for pharmacological treatment of intestinal dysbiosis, recombinant alpha-interferons Roferon-A (alfa-2a) and Altevir (alfa-2b).**
**Keywords: genetic engineering, pharmaceuticals, Subalin, Roferon-A, IFN, Altevir**

# АКТУАЛЬНЫЕ ФАРМАКОЛОГИЧЕСКИЕ БИОТЕХНОЛОГИЧЕСКИЕ ДОСТИЖЕНИЯ ДЛЯ ПОВЫШЕНИЯ КАЧЕСТВА ЖИЗНИ ПАЦИЕНТОВ ТЕРАПЕВТИЧЕСКОГО И ХИРУРГИЧЕСКОГО ПРОФИЛЯ

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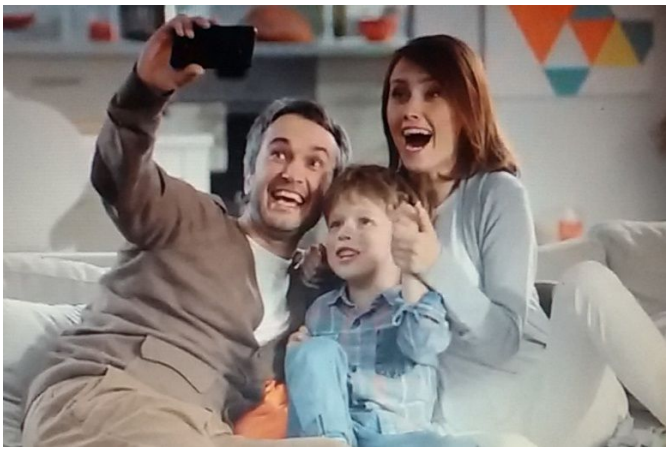
**Представлены современные эффективные лекарственные препараты, которые получены с использованием биотехнологических методик генной инженерии. Рассмотрены основные применения в хирургической и терапевтической клинической практике: современный рекомбинантный пробиотик V поколения Субалин, который был синтезирован украинскими учеными для медикаментозного лечения дисбактериоза кишечника, рекомбинантные альфа-интерфероны Роферон-А (альфа-2а) и Альтевир (альфа-2b).**
**Ключевые слова: генная инженерия, лекарственные препараты, Субалин, Роферон-А, Альтевир**

**Introduction.** It is difficult to maintain the proper balance of microflora in our days. Malnutritional diet, the use of antibiotics, stresses – all is detrimental to our health. Nowadays, therapeutic and prophylactic use of probiotics is common in the world. Probiotics – are medicinal preparations based on representatives of normal human intestinal microflora. To date, V generations of probiotics are identified [1]. Currently, hepatitis C occupies a significant place in the structure of morbidity and mortality. In the world of chronic hepatitis C (CHC) It affects about 3% of the population, or about 180 million people. Malignancy develops most often during infection HCV 1b. Experts say that in the near future HCV will represent a huge medical and economic problem [1-2].

**Materials and methods**. In this article we have analyzed the feasibility and benefits of the use of modern recombinant probiotic Subalin for pharmacological treatment of intestinal dysbiosis and based on the reviewed literature to summarize information on current antiviral drugs, which are used for medical treatment of viral hepatitis C.

**The results of the study.** The recombinant probiotic generation V - Subalin, is comprised of live bacteria, obtained through the means of genetic engineering by a group of Ukrainian scientists NGO "Vector" on the basis of the strain Bifidobacterium subtilis 2335/105. It contains the recombinant plasmid with the gene of human α2-interferon and has no analogues in the world medical practice. It also shows polytropic therapeutic effects (immunomodulating, antibacterial, antiviral, antitumor). Bifidobacterium subtilis are widespread in nature and, in particular, in food (bread and milk), water, air. The human body and B. subtilis are have coexisted for millions of years. It inhibits the growth of pathogenic and conditionally pathogenic flora, creates favorable

conditions for the normalization of the qualitative and quantitative composition of intestinal microflora (bifidobacteria, lactobacilli, escherichia coli). Bifidobacterium subtilis exists in the spore state, so it allows you to use the drug in conjunction with antibacterial drugs. Resistant to aggressive gastrointestinal tract. It promotes the development of alpha interferon - antiviral and immunomodulatory effects. Subalin helps normalize microflora, prevents and cures dysbiosis in patients receiving antibacterial agents, reduces the level of endogenous intoxication, improves the body's resistance to viral infections. Shows polytropic therapeutic effects (immunomodulating, antibacterial, antiviral, antitumor). Use in treatment: viral hepatitis A, B, C, bacterial and viral - bacterial meningoencephalitis, intestinal dysbiosis. In order to promote it in the pharmaceutical market in 2015, the media began an active advertising campaign of the domestic product [3-4].

Interferon alfa-2a (Roferon-A), one vial contains 18 million IU of recombinant interferon alfa-2a and 0,005 mg of human serum albumin, the minimum combination therapy Roferon-A with ribavirin it lasts 6 months. Initial dose - 6 million IU 3 times a week for 3 months, maintenance dose - 3 million IU 3 times a week for a during 3 months. Another major mechanism of type I interferon alpha (IFNα) is to stimulate apoptosis in malignant cell lines. Previous studies have shown that IFNα can cause cell cycle arrest in U266, Daudi, and Rhek-1 cell lines [5]. Interferon alfa-2b (Altevir) exhibits a nonspecific antiviral and antiproliferative activity, gives the synthesis of viral RNA and viral proteins in the cell and stimulates the process of antigen presentation to immunocompetent cells, has the ability to stimulate the phagocytic activity of macrophages and cytotoxic activity of T-cells and "natural killer" involved in antiviral immunity. PEG-interferon alpha-2b acts as a multifunctional immunoregulatory cytokine by transcribing several genes, including interleukin 4 (IL4). This cytokine is responsible for inducing T helper cells to become type 2 helper T cells. This ultimately results in the stimulation of B cells to proliferate and increase their antibody production. This ultimately allows for an immune response, as the B cells will help to signal the immune system that a foreign antigen is present [6]. It is used at a dose of 3 million IU 3 times a week during 24-48 weeks, is usually taken as subcutaneous or intramuscularly. Interferons

are used in combination with ribavirin. Ribavirin is a synthetic nucleoside which is structurally similar to guanosine [7].



This therapy is effective in about 75% after a year of treatment. This method has serious side effects: headache, dizziness, insomnia, confusion, increased tone of smooth muscles, tremors, changes in blood pressure indicators, aplastic, hypoplastic anemia, dryness of the oral mucosa, nausea, vomiting, diarrhea, changes in TSH levels, thyroid dysfunction, arthralgia, myalgia, allergic reactions. A new class of drugs - anti-virus agents a direct action - sofosbuvir. It suppresses the replication of hepatitis C virus. Has been developed US pharmaceutical company Gilead Sciences. Good results sofosbuvir combination of ribavirin and for less frequent genotypes 2 and 3, and combinations of the same drugs plus pegylated interferon-alpha for the most prevalent genotype 1.

**Conclusion.**

1. Subalin – is the medication without counterparts,which is composed of Bifidobacterium subtilis, and has been in coexistence with a man for millions of years. Polytropic therapeutic effect increases the effectiveness of treatment and helps to avoid polypharmacy in pharmacotherapy dysbiosis.

2. Treatment during the first six months is more effective than once hepatitis C has become chronic. Sofosbuvir with ribavirin and interferon appears to be around 90% effective in those with genotype 1, 4, 5, or 6 disease. Sofosbuvir with just ribavirin appears to be 70 to 95% effective in type 2 and 3 disease but has a higher rate of adverse effects.

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