Receiving control signals for connective tissue repair

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Introduction

The connective tissue of the human body plays an important role in its development and the main role in its aging. A person's age is determined by the age of his connective tissue (from the point of view of cosmetology). Slowing down the aging of connective tissue is one of the most important tasks of rejuvenating not only the skin, but the whole organism as a whole, as well as in solving aesthetic problems.

The main cellular elements of connective tissue are fibroblasts. These cells of mesenchymal origin are the main cells of the middle connective tissue layer of the skin, called the dermis. The main function of dermal fibroblasts is to participate in the metabolism of the intercellular substance. Condition and function of major extracellular components
connective tissue, collagen, elastic and reticular fibers and extracellular matrix depend on the activity of fibroblasts. Skin fibroblasts synthesize and secrete a large number of biologically active substances: various growth factors (KGF, EGF, FGF, TGF), components of the extracellular matrix (glycosoaminoglycans, hyaluronic acid,
chondroitin sulfate) and enzymes. With age, the number of fibroblasts in the skin decreases, and they become less active, the thickness of the dermis decreases, the moisture content decreases, as a result, the skin loses its elasticity and firmness.
- as a result, wrinkles appear. Aging of the skin in different parts of the body is uneven, open areas and skin in places of natural folds age faster. One of the main causes of aging is considereddecline
ability of skin fibroblasts to division and a decrease in the level of their synthetic activity. By stimulating these processes, the skin condition can be improved. To correct age-related changes in the skin, various methods are currently used (peeling, resurfacing, lifting),
physiotherapy methods (TNF, microwave, ultrasound, galvanic current, infrared radiation) and drugs (botulism toxin, extracellular matrix components - hyaluronic acid, connective tissue components, amino acids and enzymes). Many of these methodsstimulate
own skin cells, in particular - fibroblasts. An increase in the activity of fibroblasts and an increase in their number can also be achieved with the help of transplantation of autogenous fibroblasts to the areas of the skin where it is necessary. Before the real possible transplantation of autogenous fibroblasts, many methodological issues and safety issues of such procedures were solved [1]. Progress in this direction was achieved when they learned to cultivate (maintain the viability) of fibroblasts outside the body (in vitro). But even under optimal conditions in vitro human embryonic fibroblasts are able to divide a limited number of times (50 ± 10). The last phase of cell life in culture was defined as cellular aging, and the phenomenon is called the "Hayflick limit" [2]. Normal fibroblasts in culture retain the diploid karyotype, are able to grow only when attached to the surface

culture flask state, have the phenomenon of contact inhibition and have a limited lifespan, they are not oncogenic and have a low expression of histocompatibility antigens [3]. Scientific research and clinical development in this direction is going veryintensely, which is associated with the general development in the world of cellular technologies. It became possible to use fibroblasts cultured outside the body for the production of immunobiological medicines and therapeutic purposes. The use of cell cultures in the world of cosmetology began relatively recently, with the use of both allogeneic (foreign to the body) [4] and autogenous fibroblasts [5]. The results of world experience indicate the effectiveness of using one's own cells to slow down the aging process and improve the condition of the skin. The duration of the preservation of the effect after transplantation of autogenous cells ("Isolagen" USA) according to the results of world practice is up to 7 years. The explanation for this phenomenon may be that during the cultivation of autogenous fibroblastsin vitro

their reactivation ("rejuvenation") occurs, that is, a return to a state similar to the nature of mesenchymal stem cells. The cell culture obtained after trypsinization of the biopsy material contains both "young" and "old" cells. All these cells are placed in a medium containing embryonic serum, that is, in conditions somewhat similar to those existing in the embryonic state. At the same time, there is an active stimulation of the proliferation of "young" cells that retain high capacity for growth and division, and dilution and washing out of the culture of "old" cells that have lost the ability to proliferate. When transplanted back into the patient's skin, such a reactivated cell culture: actively populates the dermis, intensively synthesizes the entire complex of components of the extracellular matrix and growth factors [4, 5].

purpose of work

To obtain a group of effective control signals that allow regulating the processes: tissue proliferation of fibroblasts and maintaining their stable activity.

Hypothetical model of the control signal

The authors' working hypothesis is that, presumably, there are two classes of control signals (CS) that regulate
proliferative processes of the connective tissue of the body:

1. The first class of signals is, from a systemic point of view, information that an active process of proliferation of connective tissue is taking place in the body, accompanied by the formation of fibroblasts and stem cells, their mitosis and their replacement of damaged cells (or parts) of connective tissue. In this case, the natural response of the organism will be a comprehensive adaptation of the organism as a whole to the course of integral adaptation and its subsequent stabilization. It is natural to assume that the basic signal of this type is the issued CSbreeding

(alive) fibroblasts.

2. The second class of CS is a signal that informs the body about death of connective tissue cells and fibroblasts, in this case it can be assumed that the body's natural response to the signal will be an increase in the reproduction of its own fibroblasts. Note that this process, by its definition, is not equilibrium, it does not provide for a state of stabilization of the connective tissue, the basic signal of this type isdeath signal fibroblasts.

Due to the difference in the hormonal background of the male and female body, it can also be assumed that the control signals will be different in their structure.

Materials and methods

For holding signal recording was used: apparatus for electropuncture diagnostics, drug testing, adaptive bioresonance therapy and electro-, magnetic and light therapy by BAT and BAZ computerized "IMEDIS-EXPERT", Registration certificate No. FS 022a2005 / 2263-05 dated September 16, 2005

To obtain the fibroblast signal, cultures of human fibroblast cell material were used. The initial obtaining and cultivation of fibroblasts from a biopsy specimen is always carried out according to the standard technique. During cultivation, a medium containing 90% of the DMEM nutrient medium is used.4 and 10% fetal calf serum, cloning of fibroblasts, trypsinization with Versene solution and trypsin at 4°C. Then the cell suspension is plated on plastic Petri dishes and incubated under saturating humidity at 37 ° C, with

3-5% CO_2. On days 14–18, there is a sufficient growth of fibroblast colonies in culture [6]. The ability of fibroblast cells to proliferate and life expectancy in culture does not correlate with the age of the donor [7].

The signal was recorded from the culture of the grown fibroblast cells after opening the Petri dishes. living fibroblasts using a light probe (through a transfer, through all meridians), an inductor. The signal was summed up.

Then, for 7 days (every morning and evening), the signal of cell death (dying) in the culture was recorded. The signal was summed up.

On the 7th day, fibroblast preparations of potency D3, D6, D12, D15, D30 were prepared from the culture of fibroblast death cells by the method of potentiation according to Korsakov.

List of drugs received

Live female fibroblast signal. Live male fibroblast signal.

Signal (sum of signals) death of female fibroblasts. Signal (sum of signals) death of male fibroblasts. Potentiated female fibroblasts (organopreparation) of potencies D3, D6, D12, D15, D30.

Potentiated male fibroblasts (organopreparation) of potencies D3, D6, D12, D15, D30.

Basic indications for use

Recommendations: adaptation of the patient to the signal of fibroblasts and to potentiated drugs when the following conditions are met:

KMX ↓ + Pot Rev. fibroblasts ↑

1. To activate the proliferation of own fibroblasts with signs aging, scar tissue, traces of acne.

2. To eliminate possible problems and obtain the best result when further replanting of grown autogenous fibroblasts.

Contraindications for use

A contraindication to the use of all the above-described drugs is their constitutional inconsistency in the sense that not the condition is satisfied:

KMX ↓ + Pot Rev. fibroblasts ↑

This indicates that the price for the adaptive response of connective tissue repair will be higher than the benefit obtained from this response, and the use of the drug is inappropriate.

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