Tweezers and scalpel for biotechnology

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The main obstacle to the implementation of biotechnology is the lack of a selective "scalpel and tweezers" for working with biosystems, microorganisms, microbes, viruses, biomolecules and particles with small sizes, including less than $10^{-9}$ m.

The idea of such a scalpel came to me in 1984. The reason was the painful search for effective methods of treating cancer and other complex diseases based on a synergistic approach. After numerous meetings with V.I. Ozhogin and S.P. Kurdyumov and discussions of the methods of MRI, EHF-therapy and SQUIDs (for MEG), the final solution for such an idea was formed.


In 1984, the proposed method of selective scalpel was tested on the basis of the growth of colonies of bacteria of the genus Proteus. Assistance in carrying out the experiments was provided by the staff of the Department of Microbiology of the IGMA L.D. Osipov and P.S. Timonov.

The results of the experiments carried out in April-May 1984 are shown in Pic. 1-4.

**Pic. 1. Experience scheme.**

**Pic. 2. Standard inoculation and growth of bacteria of the genus Proteus.**

**Pic. 3. Proteus growth, with synchronization, without microwave.**

**Pic. 4. Proteus growth, with microwave and synchronized.**

Instruments and experimental conditions: generator "LUCH-3" (frequency 2.375 GHz); thermostat TS-80; microwave resonator ($H_{101}$); SmCo magnet (cylinder, 6*8 mm$^2$); spot sowing; synchronization - cold ($5^\circ$ C, 8 h). Features of the results of the experiments: Fig. 3 - weakening of growth at the location of the magnet; Pic. 4 - cessation of growth at the location of the magnet (resonance ~ 2.8 MHz / Oe).

The decision to publish the results of 1984 was made by me after the events that have become known to me and occurred [1-7], including 2019-2020.