

## «Induction» Experiment

## INFLUENCE OF MICROGRAVITY ON THE LYSOGENIC CYANOBACTERIA

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The purpose of the experiment is to study the influence of microgravity at the level of prophage induction and peculiarities of their lytic development in lysogenic cyanobacterium culture. The main objectives are as follows:

- to study the influence of standard and space flight factors on growth characteristics of the lysogenic culture and level of prophage induction;
- to carry out analysis of physical-chemical properties of virus particles and DNA of induced prophages, as well as molecular-biological characteristics of their excision.

The cloned lysogenic culture of filamentous cyanobacterium *Plectonema boryanum* CALU 465 and the test culture will be used as a model for deter-

mination of the level of induction and accumulation of virus particles.

The methods of molecular virology will be applied, e. g., the electron microscopic analysis of morphology of virus particles, determination of kinetic and thermodynamic parameters of adsorption, physical-chemical characteristic of virions, polymorphism of restriction fragments length, genome hybridization, HPLC-analysis of the modified bases, creation of data bases and statistical data processing.

Obtained results will be a basis to develop the general concept for evaluation of reliability of a system of stabilisation of the intergenomic virus — host cell interactions for a wide range of living systems.

## «Gentrans» Experiment

EXCHANGE OF GENETIC INFORMATION BETWEEN BACTERIA  
IN MICROBIOCENOSIS UNDER MICROGRAVITY

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The purpose of the experiment is to study the exchange of genetic material between bacteria in microbiocenosis during space flights. The endophytic bacteria have a set of beneficial properties for plants, e. g., nitrogen fixation, phytohormone production, etc. They will be genetically modified and applied to simulate the exchange of genetic information between them and recipients during interaction with plants in space- and ground-based experiments.

The objectives are the following:

- monitoring of genetically modified bacteria

(GMB) in microcosm system;

- study of the influence of microgravity on plant — bacteria interrelations in flight;
- study of the mechanism of endophytes penetration into the plant root tissue;
- design of devices needed for seed inoculation and bacteria cultivation in space flight.

Obtained results will allow elaboration of a predictive model of genetic material transfer between bacteria, as well as a model of GMB spreading in the microcosm during the space flights.