

## Division 5

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### **WORKING OUT SPACE CELL BIOTECHNOLOGY, THE METHODS OF SPACE PLANTING, WASTE UTILIZATION, AND EQUIPMENT MONITORING («Biolaboratory», «Biomedcontrol» Projects)**

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**Introduction.** Space biotechnology is one of the promising fields of space technology. The unique conditions of microgravity open up a prospect for obtaining a better separation of cell and biologically active substances, as well as growing protein crystals and other biopolymers. However, manufacturing biopolymer crystals in orbit is the only short-term practical benefit, which may be derived from space biotechnology. All the other areas require profound basic research carried out in close cooperation of biologists, mathematicians and designers.

Having an experience of performance of biotechnological experiments at Salyut and Mir orbital stations, Ukrainian scientists propose new basic and

applied research for experiments on board the URM.

In order to meet some priority objectives of CELSS creation, Ukrainian scientists propose the following:

- working out space technologies for alga cultivation on orbit;

- selection and testing of inert organic and mineral materials with different additives of bioactive compounds and fertilizers with a prolonged effect, as substrates for plant growing in space;

- use of oligochaetae (Californian worm) for food waste utilization;

- use of daphnia as a biotest for control of general toxicity and mutagenicity of the environment, in particular, water and air in a cabin of space vehicles.

#### **«Daphnia» Experiment**

### **DAPHNIA AS BIOTEST ON GENERAL TOXITY AND MUTAGENEITY OF ENVIRONMENT IN SPACE VEHICLES**

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The purpose of the experiment is to create a system for biological control over total toxicity and mutagenicity of the environment in space vehicles. The main objective is to develop a semi-automatic device for daphnia-biotest. The device output will be

connected to a computer for estimation of the total toxicity and mutagenicity of the environment inside space vehicles under the influence of microgravity and high-energy radiation.

Drinking and service water, aero- and gaseous