

tiation, specific functioning and metabolism of osteoblasts, osteocytes and osteoclasts, as well as their morpho-functional interactions during osteogenesis and resorption;

— to study intensity of osteoplastic and resorptive processes in bones using ultrastructural criteria worked out by the author;

— to define peculiarities of specific metabolism of the osteogenic cells (including changes in  $\text{Ca}^{2+}$ -balance);

— to study organisation of the vascular-cellular complexes in osteogenic and resorptive zones and bone compact substance;

— to establish mechanisms of correction of the os-

teoporotic remodelling by biphosphonates or other protectors.

Objects of investigation will be the bones of white rats or mice (3-4 weeks old), which were at the space station for 7-14 days and have been returned to the Earth. The methods of histology, electron microscopy, autoradiography (with  $^3\text{H}$ -thymidine,  $^3\text{H}$ -glycine,  $^{45}\text{Ca}$ ), cytochemistry, osteodensitometry will be used.

Obtained data on cytological mechanisms of gravity-dependent changes in the bone tissue will be important for working out recommendations as regards their correction.

#### «Regeneration» Experiment

### REGENERATION OF FISH DERMOSKELETON IN MICROGRAVITY

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The purpose of the experiment is to study the influence of microgravity on periosteal ossification in order to determine the cause of the bone calcification disturbance.

From this point of view, a study of the influence of microgravity on development of the dermoskeleton is the most important, because its bone elements (rays of fins and scales) are of periosteal origin.

A convenient object of investigation is a dermoskeleton of the small aquarium fish *Poecilia reticulata*. Two approaches can be used to meet this objective, namely:

— to experiment with the larvae, which have no bone skeleton yet. Study of the structure of dermoskeleton elements after landing will permit clarifying the influence of microgravity on initiation of ossification and development of dermoskeleton elements.

— to experiment with the adult fishes with partly (2/3) amputated caudal fins. A comparative analysis of the amputated part of fins and their regenerates after landing will permit to find out the influence of microgravity on periosteal ossification.

Histological, histochemical and electron-microscopy methods will be used.