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Changing of mechanical properties of bone tissue by loading and unloading hanging

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Studies performed in conditions of a microgravity models and microgravity models with putting on animal's feet. All tests were conducted on nonlinear laboratory rats (180-200 g). As a model of gravitational unloading we used antiorthostatic support model. All experiments were performed according to bioethical standards and were approved by local ethical committee of the Kazan Federal University. The femoral bones were dissected from all tested rats with following weight measurement, density evaluation and measurement of geometrical parameters. At the end, the stress tests with a three-points bending were performed. After testing Young's module an ultimate stress was calculated. It was investigated on different groups: Control, microgravity models for 7 days of unloading hanging and models 7 days of unloading hanging with putting on animal's feet for 3 hour every day. In hypogravitational models Young's module decreased slightly, but ultimate stress decreased significantly. In case of putting on animal's feet Young's module restores its value (deviation about 5%) and ultimate stress increases up to 33% (in comparison with hypogravitational models). Against the background of control group ultimate stress decreased up to 45%. These results emphasize that the bone strength can be decreased by influence of external forces.

Biography

Maxim Baltin has graduated from the Kazan Federal University with a bachelor degree in Physiology. He has graduated from the Kazan Federal University in the laboratory of motor neuro-rehabilitation.

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