

## **PHASE CHANGES IN ENERGY METABOLISM DURING CHRONIC STRESS**

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Chronic stress exerts multiple cellular and tissue effects associated with damage by lipid peroxides, and the disrupted barrier function. As a consequence, it may results in the syndrome of "stress-induced lung", violation of oxygen delivery to the tissues, and hypoxia. The aim of the study was to identify possible similar metabolic changes during chronic stress. In male Wistar rats, the dynamics of gas exchange, blood glucose, body temperature, oxidant and antioxidant system activity, as well as mitochondrial respiration by Chance under the influence of chronic stress (6-hour immobilization daily for 3 weeks) was investigated. It was identified 4 phase changes of energy metabolism in the dynamics of chronic stress. In the first phase, hypometabolic, instability oxidative metabolism, decreased oxidation of NAD-dependent substrates, significant elevation of FAD-dependent substrates oxidation and low MRU were found. The activity of superoxide dismutase (MnSOD) was increased. After seven immobilizations, second phase - shift in energy metabolism, was observed, and then the third phase (hypermetabolic) started. It was characterized by gradual increase in oxidative metabolism, the restoration of oxidation of NAD-dependent substrates, MRU, as well as optimizing balance of oxidant and antioxidant systems. The fourth phase was started after 15 immobilizations, and characterized by the development of adaptive reactions expressed in increased tolerance of energy metabolism to the impact of immobilization. The results are correlated with changes in the dynamics of blood corticosterone. Thus, in chronic stress we found the phase character of the energy metabolism rebuilding.