

## **DYNAMICS OF ENERGY METABOLISM IN THE RECOVERY PERIOD AFTER ACUTE HYPOXIA AND DURING PERIODIC HYPOXIA**

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Basic patterns and sequences of processes occurring in the body during various hypoxic treatments are poorly understood. The aim was to compare impact of different hypoxic regimen on dynamics of energy metabolism. Male Wistar rats were exposed to periodic hypobaric hypoxia (PHH) (6 séances at 5600 m, 1 hour each 3 days), or acute hypoxia (5600 m, 3 hours). The dynamics of oxygen consumption ( $VO_2$ ), body temperature ( $T_b$ ) and mitochondrial respiration by Chance was studied during 2 weeks. Four phases of physiological changes were found in both experiments, after acute hypoxia and during PHH. The first (near of 7 day) – hypometabolic phase, accompanied by decreasing of  $VO_2$ ,  $T_b$ , and increasing of FAT-dependent substrate oxidation,  $V_3/V_4$ , ATP/O. The second, transition phase is observed by 5-7 days after start, in which activation of metabolism was occurred. In the third phase (7–12 day or more) of recovery metabolism, or hypermethabolic, increased  $VO_2$ , decreased  $V_4$ , increased NAD-dependent substrate oxidation,  $V_3/V_4$ , ATP/O was found. The fourth, phase of adaptation, was characterized by normalization or reduction of  $VO_2$ . These results were correlated with changes in the expression of factors HIF-1 $\alpha$  and HIF-3 $\alpha$ , MnSOD. Thus, common regularities in the phase changes in the PHH and the period of recovery after acute hypoxia were found. *The work was supported by joint grant of SFFRs of Ukraine and Russia, №F53.4/038.*