
**МАТЕРИАЛЫ КОНФЕРЕНЦИИ
И ШКОЛЫ**

**THE HYPOTHALAMIC-PITUITARY-ADRENAL AXIS UNDER STRESS
AND AGING: INDIVIDUAL VULNERABILITY IS ASSOCIATED
WITH BEHAVIORAL FEATURES AND EXPOSURE TIME**

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With aging, the incidence of stress-related diseases increases. However, the mechanisms underlying individual vulnerability to stress and age-related pathology are not yet clear. One of the promising approaches in this direction is to study the response of the key adaptive hypothalamic-pituitary-adrenal (HPA) axis to stress exposure in individuals that differ in their behavioral reactions under mild stress. The purpose of this study is to analyze the individual features of HPA axis reaction to acute stress exposure (mild immobilization for 2 hours, ASE) and the mechanisms underlying them on the model of young adult and aged rhesus monkeys with anxiety and depression-like behavior (DAB), compared to healthy age-matched control individuals with standard behavior (SB).

It was established that the HPA axis response to ASE in old primates with DAB in the afternoon, characterized by an increased vulnerability of humans and primates to stress, is significantly higher compared to old individuals with SB. These changes stems from distur-

bances in the circadian rhythm and mineralcorticoid receptor-dependent glucocorticoid negative feedback (MR–NF). Age-related smoothing of the circadian rhythm of cortisol secretion, the circadian rhythm of HPA axis stress reactivity and the weakening of HPA axis control by the MR-mediated negative feedback leads to the development of hypercortisolemia in old individuals with anxiety and depression behavior under basal conditions, as well as in response to stress exposure. In turn, hypercortisolemia and reduced secretion of DHEAS apparently contribute to the development of severe aging-related disorders in the function of the islet apparatus of the pancreas, thyroid gland, as well as neuropsychiatric and neurodegenerative diseases. Monitoring individual behavior and HPA axis functions are promising for early diagnosis and prevention of age-related pathology based on restoration of age-related dysfunction of the HPA axis.

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