Секция «Тезисы на английском языке»

## Early life proinflammatory stress impairs stress reactivity in adult rats

**Научный руководитель – Гуляева Наталия Валерьевна**

***Sokhranyaeva Liubov Sergeevna***

*Студент (магистр)*

Московский государственный университет имени М.В.Ломоносова, Биологический факультет, Кафедра высшей нервной деятельности, Москва, Россия

*E-mail: sohranyaeva@list.ru*

Depression in one of the most common diseases in the world. Current methods of diagnostic show low efficacy, therefore new ways to identify depression by biomarkers are being searched for [3]. The most important factor in depression development is stress, including early life stress [2]. Thereby the hypothalamus-pituitary-adrenal axis, that releases glucocorticoids in response to a stress, is considered to be a key player in pathogenesis of depression along with neurotrophic factors and proinflammatory cytokines. Theory suggests that long-term stress impairs the functioning of these systems, leading to changes in stress-reactivity and depression [1]. The purpose of this work was to study the influence of early life stress on the development of depression-like behavior and on the sensitivity to the acute stress in rats.

The depression-like behavior was induced in male Wistar rats by single intraperitoneal injection of bacterial lipopolysaccharide (LPS) at a dose of 50 $\mu$g/kg on days 3 and 5 after birth (DG, n=25). Control group (CG, n=16) was injected with equal volume of 0.9% NaCl. After 3 months, the depression-like behavior was indicated with following behavior tests: the sucrose preference test and the Porsolt swim test. The last one was considered as an equivalent to an acute stress, that was confirmed by increased plasma glucose level. In plasma and brain structures of decapitated rats levels of corticosterone (CS), neurotrophic factors BDNF and NGF, proinflammatory cytokine IL-6 were measured using enzyme-linked immunosorbent assay.

The injection of LPS in childhood caused a depression-like behavior in adult rats: time of active swimming in Porsolt test and sucrose consumption in response to the acute stress were decreased. In DG levels of CS in cortex and NGF in hippocampus were increased, while the BDNF level in plasma and cortex was decreased. In response to the acute stress in DG, compared to CG, levels of CS and BDNF did not change, but NGF level was higher in hippocampus.

Thereby we have shown that interoceptive early life stress caused depression-like behavior in adult rats. This behavior was linked to biochemical changes in glucocorticoids and neurotrophic factors systems. Moreover, in rats with depression-like behavior stress-reactivity of these systems was disrupted.

### Источники и литература

1) Cai S., Huang S., Hao W. New hypothesis and treatment targets of depression: an integrated view of key findings // Neurosci. Bull. 2015. №31(1). p. 61-74.

2) Nishi M., Horii-Hayashi N., Sasagawa T. Effects of early life adverse experiences on the brain: implications from maternal separation models in rodents // Front. Neurosci. 2014. №8:166.

3) Schmidt M.V., Wang X.D, Meijer O.C. Early life stress paradigms in rodents: potential animal models of depression? // Psychopharmacology. 2011. №214(1). p. 131-140.