

expression of mRNA GluR2. The following step was to assess the effect of GDNF on animal survival to acute hypobaric hypoxia. It was shown that preventive intranasal application of the neurotrophic factor (4 µg/kg) increased animal resistance to acute hypobaric hypoxia which is manifested as significantly elevated the lifetime on the "height".

## CONCLUSIONS

Our data revealed that glial cell line-derived neurotrophic factor has strong antihypoxic and neuroprotective properties. Preventive GDNF application neutralizes the negative effects of oxygen deficiency by increasing the cell viability and maintaining of functional network activity in primary hippocampal cultures at a certain functional level.

## The Role Of The Medial Preoptic Area Glycinergic System In The Social Types Of Behavior Regulation

*Z.D. Zhuravleva<sup>1\*</sup>, P.A. Denisov<sup>1</sup>, M.D. Urazov<sup>1</sup>, V.S. Tovpiga<sup>1</sup>, A.V. Lebedeva<sup>1</sup>, A.B. Volnova<sup>2</sup>, A.A. Mironov<sup>1,3</sup>, I.V. Mukhina<sup>1,3</sup>, M.Ya. Druzin<sup>4</sup>*

<sup>1</sup>Lobachevsky State University of Nizhny Novgorod, 23 b. Gagarina ave., Nizhny Novgorod, Russia, 603950

<sup>2</sup> St. Petersburg State University

<sup>3</sup> Nizhny Novgorod State Medical Academy

<sup>4</sup> Umea University

\* Corresponding e-mail: zhuravlyova@neuro.nnov.ru

**Summary.** The medial preoptic nucleus is critically involved in the social type of behavior regulation, such as parental behaviour, social recognition, sexual behaviour, ect.. A big amount of studies are focused on the role of glutamate, GABA, serotonin, and dopamine systems of medial preoptic area (mPOA) in the social types of behaviour regulation. However, the role of glycinergic system in this nucleus has not been investigated.

**Key words.** Medial preoptic nucleus, hypothalamus, glycine, sexual behaviour, social recognition

Medial preoptic area (mPOA) is critically involved in the regulation of male sexual behavior in all vertebrate species in which its role has been studied. Electric stimulation of this area determines consummatory phase of sexual behavior, while mPOA lesions in model experiments inhibit this type of behavior. Furthermore, the studies performed with mPOA slices of male rats showed that fast inhibitory responses in mPOA neurons depend on GABA and glycine. Also mPOA is involved in social recognition regulation. Social recognition supersedes any social type of behavior, particularly sexual behavior. Therefore, after the determining the mPOA glycine role in the male sexual behavior regulation, mPOA glycine role in social recognition regulation was examined. A microinjection technique and bilateral cannulas implantation into the mPOA were used in both series of experiments. For sexual behavior patterns like session duration, duration of postejaculatory period, number of intromissions and ejaculations were recorded using video registration in freely moving males in the presence of females and then analyzed. For social recognition were used the social recognition test box,

## REFERENCES

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divided into three compartments by partitions, and SMART v3.0.01 software for tracking. Bilateral microinjection of an inhibitory neurotransmitter glycine (1 mM) in male rat mPOA authentically decreases ejaculation latency period, the duration of the postejaculatory period and the number of intromission in session; bilateral microinjection of glycine antagonist strychnine (20 µM) increases the duration of the postejaculatory period. In this case, presumably, glycine depletes some mPOA inhibitory effect on sexual behavior. These results are consistent with the literature, according to which the concentration of glycine in the mPOA decreases after ejaculation and increases before the next session. An opposite effect of strychnine on this parameter also supports this hypothesis. After bilateral microinjection of strychnine (20 µM) male rats authentically prefer middle section rather than section A (with resident male rat) or section B (with intruder male rat). After bilateral microinjection of glycine (1 mM) male rats prefer section B (with intruder male rat) rather than section A and middle section. Obtained data allow to suggest that the mPOA glycine stimulation probably

makes males more socially active and better contact with the stranger males, whereas strychnine microinjections strongly decreases social activity. Obtained data show that mPOA glycinergic system plays an important role in social type of behavior regulation and needs further investigations. The research was supported by the

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