

## SUPPLEMENTARY MATERIALS

### The Biochemical Model of the Synapse in Turpaev's Studies

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Received April 17, 2018

Supplementary file S66

### INFLUENCE OF NO DONORS AND INHIBITOR OF NO-SYNTASE ON DEFENSIVE REFLEX CONDITIONING IN SNAIL

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Nitric oxide (NO) is known as one of the most important signaling molecules regulating the body's physiological functions and cell metabolism. NO is continuously produced in almost all organs and tissues by enzymatic process. Its functional role can be noticed to the central and peripheral nervous system, cardiovascular system, blood supply. NO is a natural regulator of arterial tone, and its compounds are widely used in modern cardiology clinic. As drugs, having a hypotensive effect, often use drugs - NO donors based on organic nitrates. NO-synthesizing NADPHd-positive neurons were histochemically identified in various ganglia of terrestrial snails (*Helix lucorum*). NO acts as an intercellular messenger and signal molecule in various parts of the nervous system in mollusks and mammals. It is discovered that NO coordinates a number of behavioral programs in mollusks, it is found that NO is involved in the processes of learning and memory.

This work was designed to study the influence of an exogenous NO donor sodium nitroprusside, NO donor DNIC, nonspecific neuronal NO-synthase inhibitor L-NAME on the acquisition of defensive reflex food aversion conditioning in terrestrial snail. The study was performed with solution of the following pharmacological agents: 100 mg/kg L-NAME, 500 µg/kg sodium nitroprusside (SNP), and 20 mg/kg DNIC. L-NAME, sodium nitroprusside, and DNIC, were dissolved in physiological saline (0.1 ml) and administered daily into the sinus node of snails 30 min before the start of learning. Control snails received an equivalent volume of physiological saline in the same period. In the course of experiments it was found that the chronic administration of exogenous NO donor SNP accelerates the formation of defensive reflex conditioning of snails in comparison with animals administered by the saline. Chronic introduction of DNIC also accelerates defensive reflex conditioning of snails. The daily blocking of NO-synthase by L-NAME before the defensive reflex conditioning, on the contrary, restrained the learning of terrestrial snails compared to the control group. The obtained results show that in this form of learning we studied, NO modulate the process of learning.

Supported by RFBR (grant 18-015-00274).