



**XI RUSSIAN SCIENTIFIC CONFERENCE IN  
OZONE-THERAPY  
VI INTERNATIONAL JOINT CONFERENCE  
RUSSIAN-IMEOF-AEPROMO**

**Ozone: active forms of oxygen, nitric oxide  
and high-intensity physical factors in biology and medicine.**

**Nizhny Novgorod, September 19<sup>TH</sup>-21<sup>TH</sup>, 2018**

**ORGANIZERS:**

Health Ministry of Russian Federation,  
Privolzhsky Research Medical University,  
Russian Federal Center of Nuclear Research,  
Federal Scientific Clinical Center of Physical and Chemical Medicine,  
The International Medical Ozone Federation (IMEOF),  
Russian Association of Ozone Therapists  
Spanish Association of Medical Practitioners in Ozone Therapy (AEPROMO)

**SCIENTIFIC COMMITTEE**

Karyakin N.N. Doct. Med. Sci., Rector of Privolzhsky Research Medical University (Nizhny Novgorod)  
Sergienko V.I. Academician of RAS, Scientific Director of Research Federal Scientific Clinical Center of Physical and Chemical Medicine (Moscow) →  
Peretyagin S.P. Professor, President of Russian Association of Ozone Therapists  
Boyarinov G.A. Professor, Head of Anesthesiology and Reanimatology Department of Privolzhsky Research Medical University (Nizhny Novgorod)  
Selemir V.D. Doct. Phys-Math. Sci., Correspondant Member of RAS, Russian Federal Center of Nuclear Center (Sarov)

Abstract Book¶

AEPRMO, 2018 © Revista Española de Ozonoterapia Vol.8 No. 2 Supplement 1 2018, ISSN 2174-3215 ¶

XI RUSSIAN SCIENTIFIC CONFERENCE IN OZONE THERAPY ¶

VI INTERNATIONAL JOINT CONFERENCE RUSSIAN-IMEOP ¶

¶  
¶

¶

## ¶ NITRIC OXIDE AND LONG-TERM SENSITIZATION IN TERRESTRIAL SNAIL ¶

¶

V.V. Andrianov<sup>1</sup>, T.Kh. Bogodvid<sup>1,2</sup>, A.Kh. Vinarskya<sup>3</sup>, I.B. Deryabina<sup>1</sup>, L.N. Muranova<sup>1</sup>, Kh.L. Gainutdinov<sup>1</sup> ¶

¶

<sup>1</sup>Kazan Federal University (Institute of Fundamental Medicine and Biology), ¶

<sup>2</sup>Volga Region State Academy of Physical Culture, Sport and Tourism, Kazan, ¶

<sup>3</sup>Institute of High Nerve Activity and Neurophysiology of the Russian Academy of Sciences, Moscow, Russia ¶

¶

Long-term sensitization (LTS) is a form of a long-term plasticity, in which there are signs of both nonassociative and associative learning. Previously, we found that the production of LTS in terrestrial snails depends on calcium ions; it was shown that LTS is accompanied by a decrease in the membrane and threshold potentials of the command neurons of the defensive reflex. Nitric oxide (NO) is considered in present as a new signaling molecule, which plays the role of a universal regulator. There is a lot of evidences of its involvement in plasticity-related processes. Therefore, the aim of this investigation was to study the dynamics of NO products during elaboration of LTS in the terrestrial snail. ¶

The terrestrial snail *Helix lucorum* was chosen as an object for experiments. LTS of defensive reflex closure of the pneumostome was received by application of electrical stimuli in the head 4 times a day with intervals of 1.5-2 hours for 4 days. We studied the change in the production of NO during elaboration of LTS using the electron paramagnetic resonance (EPR) spectroscopy method. EPR measurements were carried out in the X-range spectrometer EPR-ER-200 of Bruker company at a temperature of 77 K. Typical EPR spectra of nervous system and heart tissues represent triplet signals from the spin trap complex with iron and nitrogen oxide. The intensity and area of these signals is a measure of the amount of NO that is produced for the time being the spin trap in the animal's body. The obtained results show that after the elaboration of LTS of the defensive reflex, the intensity of NO production in the examined tissues of the snail decreases. ¶

The work is performed according to the Russian Government Program of Competitive Growth of Kazan Federal University (No. 17.9783.2017/8.9) and Russian Foundation for Basic Research (grant 18-015-00274\_a). ¶

¶

**Keywords:** nitric oxide, nerve system, long-term sensitization ¶