



BDNF protein (Khrimian et al., 2017), thereby maintaining cognitive function and expression also upregulation of the GPR158 which then controls expression of the plasma osteocalcin. Also, Overexpression of RbAp48 in the Dentate Gyrus of older mice alleviates the cognitive deficits of aging and restores histone acetylation (Pavlopoulos et al., 2013). In addition, the OCN binding in the Dentate Gyrus appear to boost the capacity to promote memory recognition by hippocampus development, while CA3 binding helps to recuperate a memory when partial signals are introduced (Besnard and Sahay, 2016). However, in a case when RbAp48 function is inhibited in an older mice or osteocalcin-deficient mice, both of these processes are mitigated. It should however be noted that, this complex molecular series of signals is completely different from those associated with Alzheimer's disease.

Conclusion: The ability of osteocalcin to facilitate cognitive and discriminating functions that are regulated by specific brain centers proof that various neurological deficits associated with aging can be reversed. This property classifies osteocalcin in the catalog of anti-geronic molecules just like the TIMP2 (Castellano JM, et al, 2017). Since a receptor for this hormone has been detectable in the brain, the possibility of this osteocalcin / GPR158 relationship to treat different age-related brain dysfunction is now increased. Further clinical investigation could proof futuristic therapeutic prophylaxis to various neurodegeneration disorders also.

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## **EFFECT OF ELECTRONIC CIGARETTES ON VASCULAR ENDOTHELIAL FUNCTION OF LABORATORY RATS**

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Introduction. Over the past few years, electronic-cigarettes (e-cigarettes) have become one of the most desirable alternatives to conventional tobacco cigarettes. The appearance, taste and features of use make them popular among adult smokers, as well



as among young people who have no smoking experience. Such popularity raises many concerns, as the risks associated with consumption of e-cigarettes have not been clearly identified, especially in the distant future.

The aim of our research was to assess the influence of the e-cigarette`s aerosol on the nitrate, nitrite, S-nitrosothiols and endothelin-1 levels in blood serum of laboratory rats. **Materials and methods.** The experiment was carried out on 30 WAG rats of both male and female rats, aged 10 weeks. The rats were divided into two groups: the first group – control animals (n = 10), the second group – rats (n = 20) have been exposed by inhalation of e-cigarettes aerosol for 90 days. The e-cigarettes aerosol intoxication model was reproduced using Boyarchuk chamber for simultaneous exposure of twenty rats to e-cigarettes aerosol during 15 minutes. Serum nitrite and nitrate levels were determined by the method described by K.M. Miranda. The sum of nitrite and nitrate was measured after the reduction of (NO<sub>3</sub><sup>-</sup>) to (NO<sub>2</sub><sup>-</sup>) by vanadium (III) combined with detection by the acidic Griess reaction. The (NO<sub>3</sub><sup>-</sup>) concentration was calculated by subtracting the (NO<sub>2</sub><sup>-</sup>) level from the total sum level. The serum S-nitrosothiols were measured spectrophotometrically. The serum endothelin-1 level was measured with an enzyme-linked immunosorbent assay kit (USA) following the manufacturer`s instructions. Statistical analysis of the data was carried out using the STATISTICA program (version 7.0). The results were expressed as median (Me) and interquartile range. Differences in values between groups were analyzed with the Mann-Whitney U test. P value of <0.05 was considered statistically significant.

**Results.** The nitrates` concentration Me - 23.93 [23.15; 28.11] µmol/L, p = 0.0002 and nitrites Me - 4.34 [3.17;5.27] µmol/L, p = 0.0001 in blood serum of second group were reduced significantly comparably with first group Me nitrates - 38.60 [36.14; 40.53] µmol/L and Me nitrites - 7.17 [6.23; 8.72] µmol/L due to inhalation effect by e-cigarettes` aerosol.

This indicates a decrease NO formation and activation of the free radical oxidation processes in rat organism of the second group. Determination the ET-1 concentration in blood serum of rats of the second group showed a significant increasing Me - 8.51



[8.16; 10.64] pmol/ml,  $p = 0.0001$  as compared to animals from the first group. - 6.30 [5.18; 7.88] pmol/ml. The suppression of the formation of nitrates and nitrites is possibly associated with the alkylation of NO-synthase by the pyrolyzed products of glycerol – are carbonyls. While e-cigarettes liquid is being heated to temperature 3000C, glycerol is being pyrolyzed with production the following carbonyls: formaldehyde, acrolein and acetaldehyde. It is known that excess production of carbonyl leads to acceleration of oxidative stress. Apoptosis activated by elevating free radical oxidation in endothelial cells and, as a consequence, the releasing ET-1 into the blood stream. Such endothelial dysfunction usually results, at least, to reduce NO bioavailability.

Conclusions. The results of this study show the exposure to e-cigarettes led to decreased concentration of nitrates and nitrites, and increased endothelin-1 in the blood serum of rats that indicate the development of endothelial dysfunction

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**EFFECT OF PRENATAL STRESS IN MATERNAL RATS ON THE  
STRUCTURE AND FRACTIONAL COMPOSITION OF LIVER LIPIDS IN  
THEIR ONE-MONTH-OLD OFFSPRING**

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Pathology of the digestive system occupies one of the first places in the structure of morbidity among the population of Ukraine and the world, and remains an urgent problem of clinical medicine. The number of people suffering from diseases of the gastrointestinal tract and hepatobiliary system is increasing every year in the world. The greatest concern is the fact that diseases of the hepatobiliary system among children have a chronic course, are prone to early manifestation and disability are a serious medical and social problem. A number of modern studies have highlighted that the source of many chronic diseases of the digestive system of adults, which lead not only to temporary disability, but to lifelong disability among adults, is the prenatal