

**МІНІСТЕРСТВО ОХОРОНИ ЗДОРОВ'Я УКРАЇНИ  
ВИЩИЙ ДЕРЖАВНИЙ НАВЧАЛЬНИЙ ЗАКЛАД УКРАЇНИ  
«БУКОВИНСЬКИЙ ДЕРЖАВНИЙ МЕДИЧНИЙ УНІВЕРСИТЕТ»**



## **МАТЕРІАЛИ**

**101 – ї**

**підсумкової наукової конференції**

**професорсько-викладацького персоналу**

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Under normoxic conditions, HIF is destroyed by prolyl hydroxylase with ferrous iron. With hypoxia, a cascade of reactions occurs, activating HIF;  $\alpha$  - and  $\beta$  -subunits form a heterodimer, move to the nucleus and interact with special sequences in HRE gene promoters (hypoxia responsive elements), which leads to the expression of HIF-dependent genes. In acute (short-term) hypoxia, processes occur: transition to glycolysis, activation of the mechanism of cell defense against apoptosis, production of growth factors. With prolonged chronic hypoxia in the first stages, both HIF factors are activated, HIF-1 dominates. Gradually, with moderate and prolonged hypoxia, switching to HIF-2 switches. Angiogenesis intensifies, forming an inferior microvascular bed (sinuosity, vascular jumpers), additional cell proliferation occurs, and interstitial fibrosis develops. With continued prolonged hypoxia, HIF induces apoptosis, leading to cell necrosis.

HIF reduces oxygen consumption in mitochondria by inhibiting conversion of pyruvate to acetyl CoA, suppressing mitochondrial biogenesis and activating autophagy of mitochondria concomitantly with reduction in reactive oxygen species production. In addition, metabolic reprogramming in response to hypoxia through HIF activation is not limited to the regulation of carbohydrate metabolism; it occurs in lipid metabolism as well. Recent studies using in vivo gene-targeting technique have revealed unexpected, but novel functions of HIF in energy metabolism in a context- and cell type-specific manner, and shed light on the possibility of pharmaceutical targeting HIF as a new therapy against many diseases, including cancer, diabetes, and fatty liver.

**Rohovyi Yu.E.**

### **THE ROLE OF PROBIOTICS IN THE CORRECTION OF PROXIMAL TUBULE DAMAGE WITH IRRITABLE BOWEL SYNDROME**

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The purpose and objectives: to find out protective effect of the probiotic "Alflorex", the condition of the proximal nephron of the kidney, pro-inflammatory cytokines in blood plasma, anaerobic microflora of the large intestine and the general condition of patients on the Likert scale for irritable bowel syndrome with constipation and diarrhoea.

60 patients with irritable bowel syndrome were examined including 18 men and 42 women aged from 28 to 62 years. Among them irritable bowel syndrome with constipation was found in 28 patients, and irritable bowel syndrome with diarrhea – in 32 ones. The drug "Alflorex" was administered in the dose of 1 capsule per day in the morning after meal with a glass of water. The duration of the course was 4 weeks.

The article analyzes a protective effect of probiotics on the state of the proximal nephron of the kidneys, proinflammatory cytokines of blood plasma, anaerobic microflora of the large intestine and the general condition of patients on the Likert scale with irritable bowel syndrome associated either with constipation or diarrhea.

Pathogenesis of irritable bowel syndrome is explained by the influence of chronic stress and psychogenic maladaptation with the development of anxiety reaction, which leads to hyperactivation of APUD system cells (EC-enterochromaphin, Mo - cells), which produce biologically active substances such as serotonin, motilin, substance P. The latter contribute to the development of local inflammatory process with an increase in the level of proinflammatory cytokines in the blood plasma, disorder of intestinal barrier function, and its hyperkinetic state. Hyperfunction of the large intestine under these conditions should be reduced to energy deficiency and increased use of bifidum, B.Lactis to ensure the regeneration of the intestinal epithelium. The decrease in the level of bifidum, B. Lactis causes the development of dysbacteriosis, intoxication, an increase in the products with an average molecular weight and the activation of lipid peroxidation processes. The latter cause damage to the proximal nephron with the development of tubular type proteinuria, disorder of proximal reabsorption of sodium ions. The drug "Alflorex" administered for patients with irritable bowel syndrome leads to the elimination of dysbacteriosis



with the growth of anaerobic microflora, *B. Bifidum*, *B. Lactis*, a decrease of proinflammatory cytokines in plasma, improved the general condition of patients on Likert scale.

Against the ground of the drug "Alflorex" in patients with irritable bowel syndrome, the functional state of the kidneys was restored with a decrease in the manifestations of tubular proteinuria and increase in proximal reabsorption of sodium ions.

**Semenenko S.B.**

**CIRCADIAN CHARACTERISTIC OF KIDNEY EXCRETORY FUNCTION INFLUENCED BY NITROGEN MONOXIDE SYNTHESIS BLOCKADE UNDER PHYSIOLOGICAL CONDITIONS OF PINEAL GLAND WITH PECULIARITIES OF MELATONIN EFFECT**

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The features of chronorhythmic alterations of excretory renal function under the physiological conditions of the pineal gland (PG) under the influence of a blockade of nitrogen monoxide synthesis (NO) and melatonin correction were investigated.

The experiments were conducted on 72 mature non-linear albino male rats with their body mass 0,15-0,18 kg. The animals were kept under vivarium conditions at a stable temperature and air humidity fed on a standard dietary intake. The control group included animals (n=36) kept under conditions of usual light regimen (12.00L:12.00D) during 7 days. The experimental group included animals (n=36) injected with N-nitro-L-arginine (L-NNA) in the dose of 20 mg/kg during 7 days under the normal conditions of pineal gland (12.00L:12.00D) and melatonin in the dose of 0,5 mg/kg during 7 days simultaneously. On the 8<sup>th</sup> day the animals were exposed to 5% water load with heated to room temperature water supplied and the parameters of the kidney excretory function under conditions of forced diuresis were investigated.

At blockade of NO synthesis under conditions of melatonin, significant changes in the daily diuresis rhythm were observed. The architectonic rhythm of urination was inverse in relation to the chronograms of animals that were under conditions of hyperfunction of the PG with blockade of synthesis of NO and control animals. The batiphase of rhythm was detected at 12.00 hr, the maximum rhythm displacement was shifted from 8.00 hr to 16.00 hr relative to the control group of animals and in animals that were administered L-NNA in the background of hyperfunction of the PG it was at 20.00 hr. The chronorhythmic rearrangements in animals that blocked the synthesis of NO on the background of hyperfunction of the PG and permanent illumination suggest that the blockade of NO synthesis and the use of melatonin changes the phase structure of the rhythm. The administration of melatonin against the backdrop of oppression of the synthesis NO caused a decrease in the daily diuresis in comparison with the control group. The combination of blockade of synthesis NO with the correction of melatonin in animals with hypo- and hyperfunction of PG in conditions of blockade NO synthesis had no additive effect.

**Tymofiychuk I.R.**

**SEX HORMONES PARTICIPATION IN THE PATHOGENETIC MECHANISMS OF ALZHEIMER'S DISEASE**

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In scientific works of recent years increasing attention is paid to the influence of sex hormones on behavioral reactions, and mental activity. There is a lot of evidence that sex hormones are actively involved in the processes of neurogenesis, synaptogenesis, affecting the energy balance of neurons by regulating the functions of mitochondria. The higher incidence of Alzheimer's (AD) in women during menopause causes scientists to think about the influence of sex hormones on the development of neurodegenerative diseases. In this literature review, we set the goal to analyze the