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1. Kugaevskaya E.V.

Angiotensin converting enzyme and Alzheimer's disease.

Alzheimer's disease (AD) is an incurable degenerative disease of the central nervous system, leading to dementia. The basis of AD is neurodegenerative process that leads to death of neurons in the cerebral cortex. This neurodegenerative process is associated with the formation of neurofibrillary tangles in the brain and the deposition of senile plaques, the main component of which is a beta-amyloid peptide (Ab). Risk factors for AD are age, as well as hypertension, atherosclerosis, diabetes and hypercholesterolemia in the pathogenesis of which involved angiotensin converting enzyme (ACE) â€“ key enzyme of the renin-angiotensin (RAS) and kallikrein-kinin (KKS) systems. Recently it was discovered that ACE, along with other metallopeptidases, participates in the metabolism of Ab, cleaving the bonds at the N-terminal and C-terminal region of the molecule Ab. The role of the ACE in the degradation processes of Ab takes an interest. It is associated with the fact that the using of ACE inhibitors is the main therapeutic approach used in the treatment of various forms of hypertension and other cardiovascular diseases. However, until now not been resolved, can be used antihypertensive drugs that inhibit RAS for the treatment or prevention of AD. Currently, there are numerous studies on finding the relationship between RAS and AD.

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2. Alessenko A.V.

The potential role for sphingolipids in neuropathogenesis of Alzheimerâ€™s disease.

The review discusses the functional role of sphingolipids in the pathogenesis of Alzheimer's disease. Certain evidence exist that the imbalance of sphingolipids such as sphingomyelin, ceramide, sphingosine, sphingosine-1-phosphate and galactosylceramide in the brain of animals and humans, in the cerebrospinal fluid and blood plasma of patients with Alzheimer's disease play a crucial role in neuronal function by regulating growth, differentiation and cell death in CNS. Activation of sphingomyelinase, which leads to the accumulation of the proapoptotic agent, ceramide, can be considered as a new mechanism for AD and may be a prerequisite for the treatment of this disease by using drugs that inhibit sphingomyelinase activity. The role of sphingolipids as biomarkers for the diagnosis of the early stage of Alzheimer's disease and monitoring the effectiveness of treatment with new drugs is discussed.

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3. Ryzhakova O.S., Zavalishina L.E., Andreeva Ju.Ju., Solovyeva N.I.

Interstitial collagenase, gelatinases A and B and their endogenous inhibitors in squamous cell cervical carcinomas.

Interstitial collagenase and gelatinases are matrix metalloproteinases (MMP), which play the key role in tumor invasion and metastasis. The aim of this study was to elucidate the peculiarities of expression of interstitial collagenase (MMP-1), gelatinases A and B (MMP-2 and MMP-9) and their endogenous tissue inhibitors TIMP-1 and TIMP-2 as invasive factors of squamous cell carcinomas (SCC) of human cervical cancer. The study was carried out using 24 specimens of SCC and 11 specimens of adjacent to tumor morphologically normal tissue. All carcinoma specimens expressed E7 HPV-16 gene. It was shown that the increase of MMP-1 and MMP-9 expression and low of TIMP-1 and TIMP-2 expression makes the main contribution to the destructive (invasive) potential of SCC. The change of MMP-2 expression is not so significant and it is less influenced to the destructive potential. Moreover, substantial expression of MMP-1, MMP-2 and MMP-9 was registered in the specimens of morphologically normal adjoining to tumor tissue. This expression was found to make an additional contribution to the destructive potential of cervical tumor.

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4. Sukhanova T.V., Artyukhov A.A., Prudchenko I.A., Golunova A.C., Semenikhina M.A., Shtilman M.I., Markvicheva E.A.

Delta-sleep inducing peptide entrapment and release from polymer hydrogels based on modified polyvinyl alcohol .

The aim of the study was to entrap delta-sleep inducing peptide (DSIP) in cross-linked poly(vinyl alcohol)-based hydrogels of different structures and to evaluate peptide release kinetics from these hydrogels using an in vitro model. Isotropic and macroporous hydrogels on the basis of poly(vinyl alcohol) acrylic derivative (Acr-PVA) as well as macroporous hydogels containing epoxy groups which were synthesized by copolymerization of this monomer with glycidyl methacrylate. The isotropic hydrogels were fabricated at positive temperatures while the macroporous hydrogels (cryogels) were prepared at the temperatures below zero. The peptide was entrapped into macroporous modified PVA hydrogels by addition of a peptide solution on previously fabricated matrices, while into PVA-GMA hydrogels containing epoxy groups peptide immobilization was carried out by incubation of hydrogel matrices in the peptide solution. In the case of isotropic hydrogels the peptide was added into the polymer mixture at a hydrogel formation reaction. The peptide release kinetics was studied by incubation of hydrogels in PBS (pH 7.4), in physiological solution (0.9% NaCl) and in water. DSIP concentration in supernatants was determined by phase-reverse HPLC. DSIP release from the macroporous PVA hydrogel after 30 min incubation was 74, 70 Ð¸ 64% in water, PBS and 0.9% NaCl, relatively, and it was completed in 3 hs. From the isotropic hydrogel the release neither peptide nor products of its degradation was not observed even after 48 hs of incubation. For freshly prepared hydrogel the release kinetics was as follows: 27 and 78% in 30 and 33 hs, relatively. In the case of the lyophilized hydrogel samples the peptide release was 63% in 30 min incubation while drying patterns at room temperature for 3 days resulted in significant peptide loss because its structure damage.

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5. Petushok N.E., Grohovskaya T.Ch., Melnichenko N.G., Pronko S.P.

Influence of ethanol-metabolising systems on intensity of lipid peroxidation processes in gastrointestinal tract of rats.

The effects of some ethanol-metabolising systems (aldehyde dehydrogenase, catalase, cytochrome P450 2E1) on activation of lipid peroxidation (LPO) processes in gastrointestinal tract of rats have been studied using inhibitors of these systems. The intensity of LPO processes was evaluated by thiobarbituric acid-reactive products and chemiluminiscence intensity. It was found, that the acetadehyde metabolism play the main role in the indiction of lipid peroxidation in the gastrointestinal tract of rats.

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6. Tkachev V.O., Zaikovskaya M.V., Troitsky A.V., Luzgina N.G., Shkurupy V.A.

Oxidised dextrans influence on reactive oxygen species generation by murine peritoneal exudate phagocytic cells.

The effects of oxidized dextrans of different molecular weight on reactive oxygen species production and transmembrane mitochondrial potential of macrophages and neutrophils have been studied in vivo and in vitro . Oxidised dextrans demonstrated moderate direct antioxidant ability but induced intracellular oxidative stress through the increase of oxygen radical generation. This effect of the investigated compounds amplifies the cytotoxic and bactericidal potential of phagocytes and can influence isoniazid metabolism, thus increasing its efficiency in therapy of infectious diseases.

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7. Zverinsky I.V., Melnichenko N.G., Poplavsky V.A., Sutko I.P., Telegin P.G., Shlyahtun A.G.

The effect of berberine administration of evaluation of the functional state of rat liver after ligation of common bile duct.

On the eighth day after ligation of the common bile duct in rats a significant increase in the serum content of total lipids, cholesterol bilirubin and ALT, alkaline phosphatase, and gamma-glutamyltransferase was observed. In the microsomal fraction there was a marked decrease in the content and activity of microsomal monooxygenases. Introperitoneal injection of berberine (10 mg/kg) for 6 days caused a partial normalization of permeability of hepatocytes plasma membranes and activity of microsomal flavin-containing monooxygenases. It is suggested that berberine is a substrate and inducer of flavin-containing monooxygenases. Membrane-stabilizing effect of berberine is probably realized at the level of inhibition of prooxidant status of liver cells.

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8. Dolgushin M.V., Davydova N.S.

Influence of vibration-induced stress on functional-metabolic status of blood leukocytes.

The chronic stress in albino rats caused by exposure to the whole-body vibration induced the significant changes in the functional-metabolic status of the blood cells. It involved the phagocytosis level and the lysosomal cationic proteins in the neutrophils, oxidative and hydrolytic processes in the neutrophils and lymphocytes. All the determined intracellular parameters revealed the differentiated response to stress as well as to the additive combined administration of the antioxidants (glycine and alpha-tocopherol acetate).

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9. Isay S.V., Kafanova T.V., Kim N.U.

An example of oscillatory (cyclic) reaction for prostaglandin chemistry.

It is shown an ability of prostaglandin A to the oscillatory reaction which has significance both the theoretical and practical if prostaglandins are used for therapy.

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10. Grekhova A.K., Gorbacheva L.B., Ivanova N.A., Efimenko I.A., Osipov A.N.

Comparative studies on the genotoxic activity of a new palladium (II) acidocomplex vs cisplatin in human blood lymphocytes .

A comparative study on the genotoxic activity of cisplatin versus morfozol, the first representative of a new class of cation-anion complexes of palladium [AH] [PdCl] (where A-methylmorpholine) has been performed using human lymphocytes in vitro. The results of the DNA-DNA cross-linking activity investigations showed that both compounds studied exhibited biphasic dose-effect relationship: a linear decrease in the DNA percent in the comet tail and the region of the "plateau". However, in the "plateau" region, morfozol reduced the DNA percent in the comet tail up to 6 times while cisplatin caused a 2-fold decrease only. Morfozol, like cisplatin, inducing DNA-protein cross-linking and generating reactive oxygen species, was more effective than cisplatin.

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