

1. *Dolgikh M.S.*

The modern creation technologies of implanted bioartificial liver.

The liver transplantation is the most effective method for treating severe liver disease. The hepatocytes transplantation may serve as the perspective means for treating liver failure. This review analyzes the experimental approaches and perspectives on the adult hepatocytes use for the creation of implanting bioartificial liver module for hepatic failure treatment.

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2. *Nadolnik L.I.*

Stress and thyroid gland.

The review highlights the effects of acute and chronic stress on thyroid metabolism. Special attention is paid to the influence of stress and the direct effects of glucocorticoids on the thyroid status, the activities of thyrocyte iodine uptake, oxidation and organification as well as peripheral metabolism of thyroid hormones (deposition and transport of thyroid hormones, deiodinase activities in different tissues). The role of stress in the development of thyroid pathology is analysed and characteristic features of thyroid function alterations during impaired functioning of the pituitary-adrenal system are established. The mechanisms of the stress-induced impairments in thyroid functions are of interest for further research, taking into consideration serious consequences of thyroid deficiency for the body, even in subclinical thyroid insufficiency.

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3. *Romanova S.G., Romanov V.G., Serebrennikova G.A., Shtil A.A.*

Glycerolipids of alkyl type - modulators of tumoral cells destruction.

The review is summarizing current information on biological activity and search of the antineoplastic mechanism of action of alkyl glycerolipids. Special attention is paid to following problems: selective ability phosphorus alkyl glycerolipids, antineoplastic activity, cytostatic and cytotoxic effects of edelfosine and its analogues. The review contains set of the data known for today from the literature, on the possible mechanism cytotoxic actions of such connections.

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4. *Khairullina V.R., Tarasov G.P., Gerchikov A.Ja., Zarydiy F.S., Tjurina L.A.*

Study of structure-anti-arrhythmic activity; relationship of n-phenil acetamide derivatives and amides of aromatic carbonic acids.

Using the computer system SARD-21 (Structure Activity Relationship & Design) structural features of high- and low-effective anti-arrhythmic agents have been recognized and the influence of these features on the anti-arrhythmic properties has been evaluated. This information has been used for generation of the model for prediction of anti-arrhythmic effectiveness of pharmaceutical preparations with the 82%-level of recognition by two methods. The recognized structural parameters may be successfully used for design of new highly effective anti-arrhythmic drugs, and also for modification of structures of known anti-arrhythmic drugs for the increase of effectiveness of their anti-arrhythmic action.

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5. *Pivovarova E.N., Baginskaya N.V., Perepechaeva M.L., Il'nitskaya S.I., Dushkin M.I.*

Liver nuclear hormone receptor PPAR, LXR and RXR expression and blood lipid and glucose levels in susceptible and resistant to hepatocarcinogenesis strain of mice.

Earlier it was shown that male mice of the DD/He strain were highly susceptible to ortho-aminoasotoluene (OAT) induced hepatocarcinogenesis, and resistant to spontaneous liver tumor development as compared to the $\Delta\Delta$ 57BR/Mv strain. In the present work we have made a comparative investigation of peroxisome proliferator-activated receptor (PPAR), liver X-receptor (LXR) and retinoic X-receptor (RXR) mRNA levels in liver as well as concentrations of corticosterone, glucose, lipids and insulin in blood of male DD/He and $\Delta\Delta$ 57BR/Mv mice. Using the multiplex RT-PCR method it was found that PPAR- α , PPAR- β , RXR- α and RXR- β mRNA content was essentially decreased in the liver of DD mice as compared to mice of the $\Delta\Delta$ 57BR strain. No significant interstrain differences of LXR- α and LXR- β mRNA content were found. In DD mice there was more than the 3-fold decrease of blood content of corticosterone, which is involved in PPAR and RXR regulation. DD mice demonstrated a significant decrease in blood serum glucose and insulin concentrations as well as higher reactivity to insulin as compared with $\Delta\Delta$ 57BR mice. Elevated blood total cholesterol and cholesterol HDL level were found in DD mice whereas triglyceride content was basically the same in both mouse strains. It is known that glucocorticoids, PPAR and RXR play crucial role in transcription regulation of inflammation response. Therefore our data allow to suggest that decreased corticosterone level in blood, PPAR and RXR mRNA content in liver of the DD strain may lead to induction of inflammation by OAT exposure, resulting in a high incidence of tumorigenesis in this strain.

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6. *Safonova O.A., Popova T.N., Saidi L.*

Citrate influence on oxidative status of rats tissues under experimental toxic hepatitis.

The effect of citrate free-radical oxidation intensity and aconitate hydratase, superoxide dismutase and catalase activities in liver and blood serum of rats with experimental toxic hepatitis has been investigated. Citrate administration to rats with hepatitis decreased biochemiluminescence parameters and conjugated diene content in rats tissues, increased under conditions of CCl₄-induced liver damage. At the same time aconitase activity, decreased at the pathology, increases. The superoxide dismutase and catalase activities increased in at experimental toxic hepatitis, tended towards control values after citrate administration.

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7. Bardina L.R., Pronko P.S., Satanovskaya V.I., Aliyeva Ye.V.

Effect of catalase activators and inhibitors on ethanol pharmacokinetic parameters and ethanol and aldehyde-metabolizing enzyme activities in the rat liver and brain.

The effects of catalase regulators (aminotriazole, lead acetate, taurine, di-2-ethylhexylphthalate) on the preference for ethanol, its pharmacokinetics, and activities of rat liver and brain ethanol and acetaldehyde-metabolizing enzymes were studied. Lead acetate (100 mg/kg, i.p., 7 days), aminotriazole (1 g/kg, i.p., 7 days), and taurine (650 mg/kg, i.g., 14 days) decreased ethanol consumption under conditions of free choice (10% ethanol water), whereas di-2-ethylhexylphthalate (300 mg/kg, i.g., 7 days) did not exert any effect on this parameter. Taurine, lead acetate and di-2-ethylhexylphthalate significantly activated liver ADH, MEOS and catalase peroxidase activity. Aminotriazole also activated ADH and MEOS, but inhibited liver catalase. The activities of liver and brain AIDH as well as catalase were insignificantly changed by this treatment. The 7-day administration of lead acetate, di-2-ethylhexylphthalate and aminotriazole administrations significantly influenced the ethanol (2g/kg., i.p.) pharmacokinetic parameters: the area under the pharmacokinetic curve and the elimination half-life time were significantly reduced, whereas the elimination constant and clearance were increased. This unequivocally indicates accelerated ethanol elimination. The 14-day ingestion of taurine insignificantly changed the parameters of ethanol pharmacokinetics in rats.

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8. Vavilova T.P., Tarasenko I.V., Medvedev A.E., Ostrovskaya I.G.

The effect of various modes of surgical injury of rat buccal mucosa on the content of basic fibroblast growth factor and interleukins 1 β and 6 in the dynamics of reparative processes.

The content of basic fibroblast growth factor (bFGF) and also interleukins 1 β and 6 (IL-1 β and IL-6) has been investigated in rat buccal mucosa after its surgical injury by an erbium laser (Er:YAG laser) and a scalpel. The laser emission caused a sharp increase in the content of these regulators on the second day after treatment followed by decrease observed on the seventh day. These results may reflect synergistic effect of these peptide regulators in the wound defect. Changes in time-course of bFGF, IL-1 β and IL-6 release in the wound formed by the laser beam compared with the wound induced by the cutting instrument may promote earlier appearance of the proliferation phase.

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9. Globa A.G., Demidova V.S., Dikova O.N., Vishnevskiy V.A., Shchegolyev A.I.

The study of RNA markers in blood of patients with malignant tumors of gastrointestinal tract.

In order to develop a diagnostic panel, mRNA levels of tumor marker genes have been evaluated in capillary blood of patients with various malignant tumors of the gastrointestinal tract (GIT) by means of the method of reverse transcription combined with real-time PCR with detection of reaction products using TaqMan probes. Use of small volumes of capillary blood did not decrease sensitivity of this method. RNA expression of telomerase (mhTERT), alpha-fetoprotein (mAFP), carcinoembryonic antigen (mCEA) and cytokeratin-20 (mCK-20) was higher in most patients with tumors. Blood of donors or non-oncological patients contained much lower (trace) amounts of the RNA markers. The RNA markers are characterized by reasonably high specificity and sensitivity acceptable for diagnostic application. The mhTERT marker was the most universal one and exhibited the highest specificity and sensitivity. Combined determination of several RNA markers increased sensitivity of this method. It is concluded that determination of RNA markers in small volumes of capillary blood may be used for screening, primary diagnostics, and postoperative monitoring.

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10. Strelkova I.Y., Abdullaev S.A., Snigireva G.P., Bezlepkin V.G., Gaziev A.I.

Share of extracellular mitochondrial DNA with a mutations increases in the plasma of patients lung cancer after radiotherapy.

Quantitative and qualitative changes in circulating extracellular DNA (ec-DNA) of blood plasma are considered as markers for diagnosis and prognostic of tumor pathology. We investigated the content of mutant copies of the circulating extracellular mitochondrial DNA (ec-mtDNA) in blood plasma (using the enzymatic method, based on the cleavage of DNA with unpaired bases by CEL-I endonuclease) in 8 patients with lung cancer before and after radiotherapy, as well as in healthy young and elderly donors. It was found that in the plasma of healthy elderly donors share of ec-mtDNA with mutations (consisting of total circulating DNA) is much greater, than that of young donors. On the other hand, in the plasma of lung cancer patients (aged 70-76 years) before radiotherapy a substantial increase in the share of ec-mtDNA with mutations, compared with that of healthy elderly donors. Following radiotherapy, patients with lung cancer found a twofold increase of the proportion of ec-mtDNA with mutations in the total circulating plasma DNA. This increase is largely, perhaps due to the release of ec-mtDNA with mutations from dying tumor cells and cells damaged by normal tissues.

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