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Конференція внесена до Реєстру заходів безперервного професійного розвитку, які проводитимуться у 2023 році №5500074

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exposure, which activate the formation of reactive oxygen species and, along with the direct destruction of cells and organelles, are triggers of metabolic processes dysfunction.

The aim of the study. To determine the influence of melatonin on the level and chronorhythms of changes in the total antioxidant activity (TAOS) of the rat's blood serum with toxic hepatitis under the conditions of different functional activity of the pineal gland (PG).

Material and methods. Experimental studies were carried out on white non-linear male rats weighing 170±10 g. For 14 days before the beginning and throughout the experiment, the animals were kept under different conditions of the light regime (simulation of different functional activity of the pineal gland): group A - PG normofunction - (12 hours of light: 12 hours of darkness); group B – PG hypofunction - (24 hours of light: 0 hours of darkness); group C – PG hyperfunction - (0 hours of light: 24 hours of darkness). Daylight lamps with an intensity of 1500 lux were used in the experiment. On the 15th day of light exposure, subgroups were formed in each group of animals: I - control - continued to be kept under the appropriate conditions of the light regime; II – animals were injected intragastrically with melatonin solution (3 mg/100 g of body weight) every day at 8:00 a.m.; III – 50% oil tetrachloromethane solution in a dose of 0.25 ml/100 g of mass was administered intragastrically to the animals twice (every other day); IV – after tetrachloromethane intoxication (see group III), animals received melatonin for 7 days (see group II). Animals were euthanized by decapitation under light ether anesthesia at 8:00 a.m. and 8:00 p.m. TAOS of blood was shown as a percentage of inhibition of spontaneous peroxide oxidation of endogenous lipids of the brain (according to the content of malondialdehyde). Statistical processing of the obtained results was carried out using the Student's parametric t-test.

Results. Analyzing the obtained results, was established that the TAOS has a rhythmic activity during the day with a predominance in the evening hours. Under the conditions of different functional activity of the PG, this rhythm is preserved, however the absolute values differed under the conditions of hypofunction of the PG (group B1 by 9% and 6% lower at 8:00 and 20:00, respectively, compared to animals of the A1 group) and hyperfunction of the PG (group C1 at 18-20% exceeded the indicators of group A1). When melatonin was administered, the TAOS tended to increase in all groups of animals compared to the control with the highest probability under conditions of normofunction of the PG (13-15%, respectively, at 8:00 a.m. and 8:00 p.m.). Intoxication of animals with tetrachloromethane caused changes in both the chronorhythm and the absolute values of TAOS. There was a tendency to reversion of the rhythm with predominance of activity in the morning hours regardless of lighting conditions. As for the absolute values, the decrease in activity was from 17% (group III at 8:00 a.m.) to 40% (group VIII at 8:00 p.m.). In tetrachloromethane intoxication condition, the introduction of melatonin contributed to the restoration of the TAOS rhythm in the blood with a predominance in the morning hours and contributed to an increase in indicators in all groups of animals approaching the level of control values: in the AIV group by 30% (8:00) and 46% (20:00); in the VIV group by 16% (8:00 a.m.) and twice at 8:00 p.m.; in the CIV group by 21% and 37% at the corresponding hours.

Conclusions. Under the conditions of toxic hepatitis, melatonin shows a positive effect on the total antioxidant activity of the blood and increases its level under conditions of different functional activity of the pineal gland (the most likely changes are observed under conditions of hypofunction of the gland). In addition, melatonin exhibits the properties of a regulator of the daily rhythms of the TAOS of the blood, which arise during the development of oxidative stress due to toxic liver damage.

Lukan Yu.R.

SYNTHESIS AND PHYSICOCHEMICAL PROPERTIES OF $AgInS_2$ NANOPARTICLES

Department of Medical and Pharmaceutical Chemistry
Bukovinian State Medical University

Introduction. The semiconductor material of group I-II-VI, $AgInS_2$, due to its unique photoelectric and catalytic properties, is widely used in the field of photovoltaic solar cells and low-toxic photostable molecular analyzers. The advantages of these quantum dots (QDs) are that their

properties can be altered not only by changing the size of the quantum dots, but also by changing their composition, the ratio of concentrations of precursors and stabilizer, the nature of the stabilizer, the temperature of the mixture during synthesis and post-synthetic heat treatment, and the formation of a passivating membrane.

Nowadays, various strategies for synthesizing $AgInS_2$ nanoparticles (NPs) have been proposed, such as hydrothermal, solvothermal and hot injection synthesis, as well as synthesis in an aquatic environment. Compared to approaches based on organic substances, the synthesis in an aquatic environment is more reproducible, inexpensive, environmentally safe, and biocompatible, and the prepared samples are water-soluble, which is especially important for further biomedical implementing. The composition of ternary QDs can be controlled by the synthesis conditions, most studies usually focus on optical and/or photovoltaic properties which depend on the composition of the QDs.

The aim of the study. The aim of the work was the introduction of $AgInS_2$ nanoparticles into crystals of ionic salts from the aquatic phase to obtain promising photoluminescent (PL) materials.

Material and methods. PL spectra were recorded at room temperature using Ocean Optics USB2000+ (powder analysis) and USB650 (solution analysis) spectrophotometers with SpectraSuite software. A solid-state laser with a wavelength of 405 nm was used as an excitation source.

Results. Photoexcitation in quantum dots creates an exciton that is limited by the volume of the semiconductor nanoparticle. Due to the quantum-size effect, the decrease in the diameter of the quantum dot leads to an increase in the energy of the forbidden zone and discretization of the energies of electronic levels. As a result, the absorption and emission spectra of quantum dots depend significantly on their size and shift to the short-wavelength area as the diameter of the nanoparticle decreases.

The radiation of semiconductor nanoparticles can be characterized by four main parameters: brightness, the position of the photoluminescence maximum, the spectral width of the radiation (purity of color), and the stability of the radiation in time.

Conclusions. A clear dependence of the effect of the initial ratio between the indium and silver precursors and the heat treatment time on the optical properties and photostability has been established: an increase in [In]:[Ag] and the duration of the post-synthetic heat treatment leads to an increase in the photoluminescence intensity and photostability for $AgInS_2$ and $AgInS_2$/ZnS QDs.

The results of atomic adsorption spectroscopy indicate that the formation of the ZnS membrane on the surface of $AgInS_2$ quantum dots is not due to the epitaxial growth of ZnS on the surface of the particles, but due to the cation exchange between Zn^{2+} and In^{3+}.

Panasenko N.V.

SYNTHESIS AND ANTIMICROBIAL ACTIVITY OF 4-NITROIMIDAZOLE-5-THIOACETIC ACID HYDRAZIDES

Department of Medical and Pharmaceutical Chemistry
Bukovinian State Medical University

Introduction. In modern methodologies of the rational construction of new biologically active substances and leader compounds for the creation of medicinal products, imidazole-containing structures play a key role due to their powerful medical and biological potential. An important place among imidazoles is owned by various types of their functionalized derivatives, which are characterized by antibacterial, antifungal, anticancer, antituberculosis and mutagenic effects.

The aim of the study. In general, the nitroimidazole scaffold turned out to be very effective for the design of a wide range of bioactive compounds with pronounced antimicrobial and antituberculosis effects, selective agonists of the histamine H_3 receptor, inhibitors of mitogen-activated protein kinases. Modification of the nitro-containing imidazole cycle with other functional