



**СЕКЦІЯ 10**  
**ГІГІЕНА СЕРЕДОВИЩА І ВИВЧЕННЯ НОВИХ АНТИМІКРОБНИХ РЕЧОВИН**  
**В ЕКСПЕРИМЕНТІ І КЛІНІЦІ**

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**SUBACUTE TOXICITY OF SPHERAL SILVER NANOPARTICLES IN RATS**

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Silver nanoparticles (SNP) are nanoparticles of silver of between 1 nm and 100 nm in size. They are becoming increasingly prevalent in consumer products. Numerous shapes of nanoparticles are constructed depending on the application at hand. Commonly used silver nanoparticles are spherical, but diamond, octagonal, and thin sheets are also used.

Their extremely large surface area permits the coordination of a vast number of ligands. The properties of silver nanoparticles applicable to human treatments are under investigation in laboratory and animal studies, assessing potential efficacy, toxicity, and costs.

Although silver nanoparticles are widely used in a variety of commercial products, there has only recently been a major effort to study their effects on human health. There have been several studies that describe the *in vitro* toxicity of silver nanoparticles to a variety of different organs, including the lung, liver, skin, brain, and reproductive organs.

The aim of the work was to provide the hygienic assessment of harmful effects of spherical silver nanoparticles obtained by the method of photostimulated synthesis.

Three groups of animals (8 rats in each group) were daily intraperitoneally administered with a SNP solution (5 mg/kg, 1 mg/kg and 0.1 mg/kg concentration). Fourth group - biological control for 14 days. On 14<sup>th</sup> day, the animals were removed from the experiment by decapitation under mild ether anesthesia.

The following changes in the internal organs of rats were observed after the introduction of spherical nanosilver in a dose of 5 mg/kg: pronounced venous perfusion of the cortical and cerebrospinal fluid and the papilla of the kidney, the reversible swelling of the epithelium of the convoluted tubules with prevalence in the form of hydroperic swelling (72% p <0.05), reversible swelling of hepatocytes (44%, p <0.05), pronounced venous plethora of central and peripheral hepatic lobes, reversible swelling of nuclei of cardiomyocytes (28%, p <0.05), pronounced venous plethora myocardial infarction, uneven venous plethora of walls of respiratory departments of lungs (68%, p <0.05). Morphological changes in the studied organs of animals of other groups were not detected.

The intensity of pathomorphological changes under the effect of silver nanospheres increased in a line: heart, liver, lungs, kidneys.

So, silver nanospheres have a pronounced toxic effect at the dose 5 mg/kg. The target organs for the spherical SNP are kidneys, liver, heart, lungs, and brain.

**Blinder O.O.**

**PREVALENCE OF METHICILLIN-RESISTANT STAPHYLOCOCCUS AUREUS**  
**AMONG PATIENTS WITH INFLAMMATORY PROCESSES IN CHERNIVTSI REGION**

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Antimicrobial resistance stays a major global health concern, last years. It was called by World Health Organisation as one of the most urgent health threats of our time. Methicillin-resistant *Staphylococcus aureus* (MRSA) infection is still a major global healthcare problem. The clinical significance of MRSA is due to the fact that such strains are resistant to all  $\beta$ -lactam antibiotics: penicillins, cephalosporins, carbapenems. It is known from the literature about the geographical differences in the MRSA prevalence.

The aim of our study was to study the prevalence of MRSA among clinical strains of staphylococci, that were isolated in 2019 from patients with different pathology in the Chernivtsi