

**coldinbiology&medicine**



**Current Problems in  
Cryobiology,  
Transplantology &  
Biotechnology**



**Annual Conference of  
Young Scientists**

**47**



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## Abstract book 'Cold in Biology and Medicine - 2023'

**'Cold in Biology and Medicine: Current Problems in Cryobiology, Transplantology, and Biotechnology'** is the conference of young scientists, organized by the Council of Young Scientists mutually with the administration of IPC&C and UNESCO Chair in Cryobiology. Conference is held annually in May. Conference is organized to encourage the young scientists' creative and intellectual initiative, shearing their research, making an insight for the academic community into scientific activity of young scientists, and making contacts between scientists. The participants of the conference can be young scientists, PhD- and university students. The working languages of the conference are Ukrainian, Russian and English. The conference covers the investigations devoted to various aspects of low temperature effect on biologicals:

- mechanisms of damage to biological objects under the influence of low and extremely low temperatures;
- low temperature storage of biological objects (human, animal or plant cells, tissues, organs), including preparation for storage, thawing;
- cultivation of cells and tissues, etc. the response of biological objects to low temperature;
- the mechanisms of natural resistance of living systems to the cold and the process of recovery from cold exposure cold adaptation of animals and plants;
- low temperature in medicine;
- experimental and clinical transplantation;
- cryobiological and cryomedical devices;
- low temperature banks and depositories etc.

## Characterization of the hepatoprotective activity of placenta cryoextract on liver lesions of various etiologies

I.V. Koshurba, M.O. Chyzh, F.V. Hladkykh

*Institute of Problems of Cryobiology and Cryomedicine of the National Academy of Sciences of Ukraine,  
Kharkiv, Ukraine*

**Introduction.** Recently, preparations obtained from biological tissues are increasingly being considered as hepatoprotective agents. The mechanism of action of organopreparations is complex and includes direct and indirect activating influence on regeneration processes. Activation of protein synthesis by drugs of biological therapy can be carried out due to the action of substances of a peptide or nucleic nature that are included in their composition.

**Aim.** To characterize the hepatotropic effect of placenta cryoextract (CEP) in experimental liver lesions.

**Materials and methods.** Studies of the hepatotropic effect of CEP were carried out under prophylactic, curative and curative-prophylactic modes of use on models of tetrachloromethane, D-galactosamine and paracetamol liver lesions in rats.

**Results.** It was established that the prophylactic five-day introduction of CEP leads to the leveling of *tetrachloromethane-induced* activation of lipid peroxidation and signs of cytolysis syndrome – the content of reactants with iobarbituric acid in liver homogenates was lower ( $p < 0.01$ ) by 35.6% compared to the indicators of rats with simulated tetrachloromethane hepatitis without treatment. The level of alanine aminotransferases after administration of CEP decreased ( $p < 0.001$ ) by 56.0%, the level of aspartate aminotransferases decreased ( $p < 0.001$ ) by 48.6%, compared to the indicators of rats treated with tetrachloromethane induced hepatitis without treatment. There was also a decrease ( $p < 0.001$ ) in the level of total bilirubin by 33.9% and a decrease ( $p < 0.001$ ) in the levels of direct and indirect bilirubin by 10.6% and 65.1%, respectively, relative to the indicators of animals with experimental toxic hepatitis.

Against the background of the introduction of placenta cryoextract in experimental *D-galactosamine-induced hepatitis*, the level of reactants with thiobarbituric acid decreased ( $p < 0.001$ ) by 43.8%, the level of alanine aminotransferases decreased ( $p < 0.001$ ) by 2.4 times, and the level of aspartate aminotransferases decreased ( $p < 0.001$ ) by 45.3%. The level of total protein increased ( $p < 0.01$ ) by 17.4% and the level of total bilirubin decreased ( $p < 0.001$ ) by 53.5% relative to the indicators of untreated animals.

The use of CEP shows pronounced hepatoprotective activity against the background of *paracetamol-induced hepatitis* in rats. This was indicated by an increase ( $p < 0.01$ ) in the value of the antioxidant-prooxidant index by 2.3 times, a decrease ( $p < 0.001$ ) in the activity of alanine aminotransferases and aspartate aminotransferases by 44.0% and 29.6%, respectively, as well as a decrease ( $p < 0.001$ ) of the level of direct bilirubin by 52.5% against the background of CEP administration relative to the parameters of rats without treatment.

**Conclusions.** The use of cryoextract of the placenta normalized metabolic processes in the liver and restored its functional state in models of tetrachloromethane, D-galactosamine and paracetamol lesions.