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### Effect of L-arginine on cadmium induced oxidative stress in the liver of rats with different resistance to hypoxia

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The goal of the study was to estimate the effect of L-arginine, a nitric oxide precursor, on the activity of antioxidant enzymes (superoxide dismutase SOD, catalase CAT, glutathione peroxidase GPx, glutathione reductase GR), and the levels of lipid peroxidation processes in the liver of male rats with different resistance to hypoxia under cadmium (II) chloride intoxication. The influence of L-arginine in cadmium poisoning was investigated to ascertain whether this amino acid shows antioxidant properties prior to cadmium injection (preventive effect).

Our results suggest that the activity of antioxidant enzymes (SOD, CAT, GPx) is higher in animals presenting high resistance to hypoxia in the control group, and thus can serve as a compensatory reserve mechanism under unfavorable environmental conditions. Conversely, rats with low resistance to hypoxia display an increased tension of regulatory mechanisms and a decreased ability of antioxidant system, which results in the activation of lipid peroxidation processes under cadmium intoxication. We found that L-arginine lowered the level of lipid peroxidation in the livers of rats with low resistance to hypoxia compared with that of the cadmium-poisoned animals'. This indicates that L-arginine prevents damage to hepatocytes in experimental cadmium poisoning, while enzymatic activity tended to vary depending on L-arginine dose and cadmium toxicity levels. We conclude that cadmium intoxication decreases the activity of SOD, CAT, GPx and GR in rats with high resistance to hypoxia, whereas the activity of SOD, GPx and GR is higher in the livers of cadmium-exposed rats with low resistance to hypoxia. The treatment with L-arginine in cadmium intoxication caused alteration in the antioxidant enzymes activity, particularly in rats with high resistance to hypoxia.

We have demonstrated a significant protective role of L-arginine in the prophylactic therapy of cadmium intoxication, which suggests that this amino acid may be considered as an effective drug in the treatment of this condition.

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### Simple synthesis of fullerenol and estimation of its radioprotective properties

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Fullerene is the one of the carbon allotropes. Fullerene $C_{60}$ have 30 double bonds (60 $\pi$ electrons) which determine the excellent electron donor or acceptor capabilities of fullerenes. Because of the photochemical behavior, fullerenes can be effective radical scavengers or prooxidants. Chemical modification of the fullerene carbon cage by an attachment of various functional groups can be an effective way to increase functional capabilities of fullerenes.

The aim of our research was to accomplish a simple synthesis of fullerenol and to examine its radioprotective properties towards aqueous solutions of alcohol dehydrogenase (ADH).

Water-soluble fullerenol was synthesized via the direct solvent-free reaction of fullerene with a mixture of $H_2O_2$ and NaOH. The experimental investigation was carried out by UV-Vis, IR, $^1$H-NMR and mass spectrometry.

Solutions of ADH in a 20 mM Na-phosphate buffer (pH 7.4) with or without 75 μg/ml of fullerenol were exposed to 0–100 Gy of X-radiation (200 kV, 20 mA) under air. Irradiation of samples was performed in a glass beakers with gentle mixing with magnetic bar. The activity of ADH was measured after 1, 8 and 24 hours of incubation at 37°C and the radiation yield of inactivation of ADH was calculated.

Our investigations showed that fullerenol protect ADH against X-radiation. These results confirm radioprotective role of fullerenol towards this enzyme.