

Genetics & Applications

An Aspiring Interdisciplinary Journal of Genetic Research

special edition



ABMBBIH

CONFERENCE 2023

International Conference of
Biochemists and Molecular
Biologists in Bosnia and
Herzegovina

ISSN 2566-2937

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Book of abstracts

International Conference of Biochemists and Molecular Biologists in
Bosnia and Herzegovina - ABMBBIH

May, 2023

Indexed/Abstracted

This journal is indexed or abstracted by:

EBSCO, DOAJ, CAB Abstracts, Google Scholar, Global Health database, Crossref, Index Copernicus, EuroPub, Scilit and MIAR.



The Official Publication of the
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REDUCED AND OXIDIZED GLUTATHIONE AFFECTS SMOOTH MUSCLE CONTRACTILITY AND ANTI-OXIDANT ENZYMES ACTIVITY IN ISOLATED ILEUM OF MALE RAT

Grahovac Tanja, Vidonja Uzelac Teodora, Nikolić-Kokić Aleksandra, Tatalović Nikola, Oreščanin Dušić Zorana, Blagojević Duško

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Normal redox status of the cell is maintained by a number of enzymes, such as superoxide dismutase, catalase, glutathione peroxidase and low molecular weight antioxidants, such as ascorbate, tocopherols and glutathione. Maintaining high levels of reduced glutathione enhances antioxidant defense and preserves cellular homeostasis. The aim of this study was to examine whether, to what extent and in what way changes in physiological processes occurred in conditions when cellular redox homeostasis is in imbalance. The experiments were performed on isolated ileum of male Wistar rats, electrically stimulated and treated with cumulative doses of reduced or oxidized glutathione. The activity of antioxidant enzymes (catalase, glutathione reductase, glutathione peroxidase, copper–zinc superoxide dismutase and manganese superoxide dismutase) was determined in treated ileum. Glutathione in both forms decreased amplitude of ileum contractions. Cumulative doses of oxidized glutathione led to higher glutathione reductase activity while the addition of reduced glutathione increased activity of glutathione peroxidase. The results showed that maintenance of cellular redox homeostasis have influence to physiological processes.

Keywords: redox homeostasis, oxidative stress, antioxidant enzymes, ileum, rat

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