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**Study of the ionizing radiation protection activity of two natural amino acids N-acetyl-L-cysteine and trimethylglycine**

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The discovery and use of appropriate ionizing radiation protectors could significantly reduce the risk of acute radiation syndrome or chronic radiation damages (leukemia or solid tumors) after irradiation with relatively high doses radiation. During the last years of research, it was discovered that natural and cellular metabolites could be used for prevention against ionizing radiation, as non-toxic ionizing radiation protectors. The current study was focused to examine the ionizing radiation protection activity of two natural amino acids N-acetyl-L-cysteine and trimethylglycine (betaine,  $(\text{CH}_3)_3\text{N}+\text{CH}_2\text{CO}_2$ ) and their ability to prevent the development or to reduce the extent of the radiation damage. The whole survey was performed on peripheral blood lymphocytes cell cultures of healthy donors. We have used multiple methods to determine the radiation dose, the concentration of the examined substances and to analyze the radiation protection activity of the test substances. For the current survey, we used research methods such as cellular culturing, ELISA-test, dicentric chromosomes assay IR-induced cytokinesis-block micronucleus assay for generated micronuclei (MNs) in bi-nucleated cells, RT-PCR, DNA-labeling and assay of the oxidative stress. The survey results showed significant reduction of the radiation-induced DNA damages, especially in combination of both analyzed substances. Those results show correlation to the strong anti-oxidative stress activity of both amino acids.

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