The International Conference
"Biotechnologies, Present and Perspectives"
Suceava, Romania
9th Edition,
15th December 2023

ABSTRACTS

https://fiajournal.usv.ro/conference2023/

ISSN 2068 - 0819

INTRACELLULAR SYNTHESIS OF SELENIUM NANOPARTICLES USING YEASTS AND PROSPECTS OF THEIR APPLICATION IN FOOD INDUSTRY

Oksana SKROTSKA, *Oleksandr ZHOLOBKO
Department of Biotechnology and Microbiology,
National University of Food Technologies, Ukraine
skrotskaoi@nuft.edu.ua, *Zholobkoov@gmail.com

Abstract: The deficit of selenium in human body leads to the decrease of synthesis of selenoproteins, the lack of which negatively affects the glutathione peroxidase activity, which results in increased risk of thyroid gland diseases, diabetes, obesity and reproductive dysfunction. Consuming food products enriched with bioavailable selenium in form of nanoparticles might be the solution to problem. For the biosynthesis of selenium nanoparticles (SeNPs) we used *Saccharomyces cerevisiae* M437 cultivated on liquid Reader medium. Sodium selenite was added to culture liquid in 0.5-3 mM concentrations at the beginning of cultivation. Observations were carried out for 7 days. All investigated selenite concentrations, except for 0,5 mM, were toxic to the cells. However, even in non-viable cells we observed selenite biotransformation to SeNPs, since cells color turned from milky to red. At the same time SeNPs were not released into the culture medium and were bonded to the yeasts surface. We investigated the process of sodium selenite biotransformation and found out, that at its lower concentrations biotransformation rate was lower. Thus, while using selenite at 0.5 mM concentration the percentage of unreacted selenite ion was two times higher than while at 3 mM. In the future, yeasts containing selenium nanoparticles in bioavailable form can be used as food additive to recover selenium deficiency in human body and prevent diseases connected to selenium deficit in regions with low selenium content in food products.

Key words: *Saccharomyces cerevisiae, selenium nanoparticles, food products, biotechnology, yeast.*