# Characterization of Selenium Nanoparticles Biologically Synthesized by *Saccharomyces cerevisiae*

Pereira, A.G.; Gerolis, L.G.L; Pedrosa, T.A.; Gonçalves, L. S.; Silva, J.M.J.M.; Sousa V. P.; Neves, M.J.

Lab. Radiobiologia - Centro de Desenvolvimento da Tecnologia Nuclear - CDTN/CNEN, Caixa Postal 941, UFMG - Pampulha, CEP: 30123 970. Belo Horizonte, MG, Brasil.

**INTRODUCTION:** Selenium is an essential element for the health of mammals. Selenium-compounds participate in the balance of redox system, in the immune system functions, and can have anticancer effects. The main pathway of selenium incorporation by organisms is the ingestion of foods high in selenium. Selenium availability is due to the presence of this element in soil and its absorption by plants, or in food supplementation. Usually, diets are limited to the ingestion of food supplemented with selenites, selenates, and other organic selenium-compounds. These have redox states, +6, +4, and -2. Their benefits or harmful effects are subjects of many studies. However, there is not much information about the applications of selenium in its elemental form ($Se^0$), typical of nanoparticles. Our aim was to produce and characterize selenium nanoparticles synthesized by *S. cerevisiae* using the sodium selenite as a precursor. **MATERIAL AND METHODS:** *S. cerevisiae* synthesized selenium nanoparticles from a sodium selenite solution with 1mM of selenium. We used SEM and TEM to analyze size, form and exiting of nanoparticles from cells. EDS was the tool to demonstrate chemical mapping and composition of the samples. We also evaluated the influence of light and oxygen conditions in the synthesis. **RESULTS AND DISCUSSION:** *S. cerevisiae* synthesized nanoparticles after 48h in YNB broth, but only at the intracellular compartment. The SEM and TEM images showed that NPs have about 200nm and were found at extracellular space after 96h. EDS revealed the presence of selenium in samples. By SAED we identified that nanoparticles are amorphous. Nanoparticles were present either in absence of light and oxygen. **CONCLUSION:** It is possible to produce nanoparticles through biological pathway. *S. cerevisiae* synthesizes nanoparticles only at the intracellular compartment, and after 96h it expels them to the extracellular space. Oxygen and light have no interference in synthesis.

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