STUDIA UNIVERSITATIS BABEŞ-BOLYAI BIOLOGIA, LXI, 1, 2016 (p. 19-20)

=== ORAL PRESENTATION ABSTRACTS ===

The Use of Plant *In Vitro* Systems for the Synthesis of Noble Metal Nanoparticles

Gina Cogălniceanu [1,✉], Monica Mitoi[1], Alexandru Brinzan[1], Gabriela Hristea[2] and Magdalena Lungu[2]

Nanomaterial synthesis using biological organisms is a new research area, defined as nanobiotechnology. In order to prospect and develop green synthesis methods for noble metal nanoparticles (NM-NPs) extracellular and intracellular synthesis using bacteria, fungi, yeast or plants are extensively explored. Noble metal (Au, Ag, Pt, Rh, Pd) nanoparticles are the subject of intensive research, involving synthesis, characterization and applications. Due to their chemical, physical and optical properties, metal nanoparticles are very atractive for a wide range of biomedical applications, such as molecular detection and diagnostics, antibacterial activity, transport of drugs, cancer therapy. Biosynthetic methods using plant extracts proved to be simple and viable alternatives to conventional methods and suitable for developing large scale production. Biotechnological methods of NM-NPs synthesis using plant extracts are advantageous compared to the physico-chemical procedures: i) the synthesis does not require toxic solvents or additives; ii) does not result in toxic wastes for human and the environment; iii) the reactions are not energy dispersive, are relatively fast and in a single phase.

Plant in vitro systems have unexploited advantages for NPs production due to the fact that they are pathogen-free, are independent of seasonal and meteorological variations, are able to produce high amount of cellular mass all year long, offer the possibility to modulate the content of metabolites involved in NPs synthesis using elicitors and/or precursors.

[1] *Institute of Biology Bucharest, Romanian Academy, 296 Splaiul Independentei, Bucharest.*
[2] *National Research & Development Institute for Electrical Engineering, INCDIE ICPE-CA, Splaiul Unirii 313, 030138, Bucharest, Romania.*
✉ ***Corresponding author: Gina Cogălniceanu**, Institute of Biology Bucharest, Bucharest, E-mail: gina.cogalniceanu@ibiol.ro*

The aim of this research was to develop a fast, easy, efficient and environmentally friendly methodology of NM-NPs biosynthesis with potential applications in medical, cosmetic, industrial, agriculture field. We used as reducing and stabilizing agent in NM-NPs biosynthesis crude extract of strawberry callus cultures. The NM-NPs obtained were characterized by UV-Vis spectroscopy, TEM, SEM, Zeta Potential Analizer. The NM-NPs size, morphology and stability recommend them for targeted further applications.

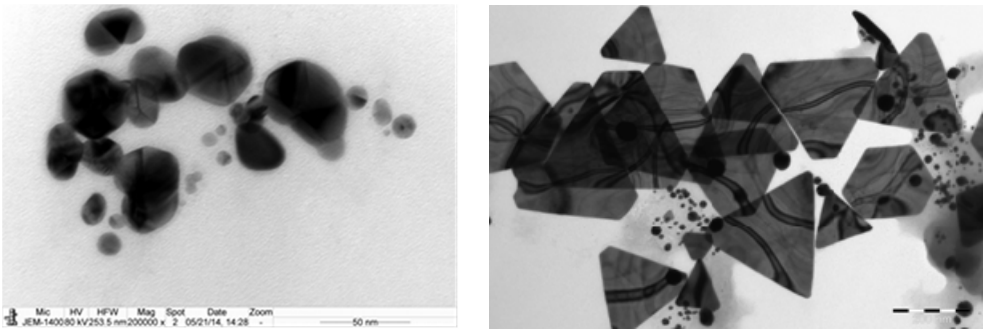

Figure 1. Nano-silver (left) and nano-gold (right) synthesized by crude extract of strawberry callus cultures.