RAMAN APPROACH TO MONITOR THE INTERNALISATION OF PEG COATED COLLOIDAL GOLD NANOPARTICLES IN CELLS

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In the last decade gold nanoparticles (AuNPs) were proposed as targeted drug delivery platforms. The conventional method used to monitor the cellular internalization of AuNPs is fluorescence spectroscopy, when dye molecules as labels are needed.

In this work we propose Raman mapping as a label-free method for monitoring the internalisation of AuNPs in A549 cells. Raman mapping provides chemical information coupled with spatial information. Raman spectra of cells were analyzed by using principal component analysis (PCA).

Short chain PEG (PEG 200) was used for the one step synthesis of AuNPs, following a procedure reported previously [1]. In this case PEG 200 was the reducing agent and surfactant, as well. Moreover, PEG 200 as surface coating agent, confers high biocompatibility to the AuNPs, as proved by MTT assay. TEM micrographs revealed a spherical morphology and a mean diameter of 12 nm.

Raman mapping enableed the discrimination between cellular compounds and the label free detection of internalized AuNPs in cells.

References

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Acknowledgement

Financial support from UEFISCDI (Executive Agency for Higher Education, Research, Development and Innovation Funding) through grant PN-II-RU-TE- 2014-4-2211, grant PN-II-RU-TE-2014-4 0944 and grant PN-II-RU-TE-2014-4-1135 is highly acknowledged.