

Raman study of MDA-MB-231 cells affected by different types of nanoparticles

B.O. Golichenko¹, V.V. Strelchuk², O.F. Kolomys², Iu.M. Nasieka²

¹ *Department of Molecular Physics, Faculty of Physics, Taras Shevchenko National University of Kyiv, prosp. Glushkova, 2, Kyiv-03022, Ukraine.
E-mail: desilor@ukr.net*

² *The laboratory of optical submicron spectroscopy, V.E. Lashkaryov Institute of Semiconductor Physics, Natl. Acad. of Sci. of Ukraine. Prospect Nauky, 45, Kyiv-03028, Ukraine.*

MDA-MB-231 cells were studied by means of confocal Raman microspectroscopy. The cells of human breast adenocarcinoma were affected with carbon nanotubes, gold and ferum nanoparticles. Then they were deposited on the thin glass slides and fixed by fixed agent in order to eliminate their mobility and influence of the external environment.

The measurements of micro-Raman spectra were carried out using the spectrometer T64000 (Horiba, Jobin Yvon) in backscattering geometry. The Ar-Kr laser (Spectraphysics) with wavelength 514,4 nm was used as the excitation source. The confocal microscope BX41 (Olympus) was used to focus the laser beam on the cell and to obtain responding signal from the sample.

The experimental results showed the intensive fluorescence of the fixing agent. In order to avoid the fluorescence background, we irradiate each cell for 2-3 minutes before the start of the acquisition. The obtained spectra indicates, that the light with the wavelength 514,5 nm is not penetrates the cell (this situation was also observed for 488 nm laser line). The spectra of the control sample and samples with nanoparticles are very similar to the spectra of the phosphatidylcholine [1] and phosphatidylethanolamine [2].

1. Gaber B., Peticolas W. On the quantitative interpretation of biomembrane structure by Raman spectroscopy // *Biochimica et Biophysica Acta*.-1977.-**465**.-P. 260-274.
2. Krafft C., Neudert L., Simat T., Salzer R. Near infrared Raman spectra of human brain lipids // *Spectrochimica Acta Part A*.-2005.-**65**.-P. 1529-1535.