

NANOPARTICLES IMAGING FROM BIOLOGICAL SAMPLES BY IR LASER LA SP ICP MS TECHNIQUE

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Nanoparticles (NP) find increasing use in diagnostic and therapeutic applications as tags for immunochemical labeling of proteins (antigens) in tissues and cells of living organisms. NP imaging by laser ablation technique combined with inductively coupled plasma mass spectrometry has recently been used for biological samples in single-particle detection mode (LA SP ICP MS).^{1,2}

Currently, UV lasers are almost exclusively used for NP ablation due to the high absorption of UV radiation by the sample, easy focusing, and the minimization of the fractionation effect. However, this radiation is strongly absorbed by the nanoparticles themselves, which causes their decay before the plasma torch and prevents their detection.

In our approach, we use a laboratory-built ablation system with a wavelength in the IR region and an ablation cell with a fast washout time, which allows us to effectively detect individual intact nanoparticles from biological samples with high transport efficiency. We have also developed an application that allows us to generate accurate and sharp distribution maps of NP on a sample.

The paper discusses the influence of UV and IR laser radiation on the quality of the resulting distribution maps of NP on a biological sample.

We gratefully acknowledge the financial support of the Czech Science Foundation (GA18-16583S) and the Ministry of Education, Youth and Sports of the Czech Republic under the project CEITEC (LQ1601) and MUNI/A/1359/2019.

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