# Labelling of Antibodies by Nanoparticles and Their Utilization in the Analysis of the Biological Samples

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Immunochemical methods are commonly used for the analysis of biological samples not only in diagnostics but also in primary research. Based on the unique reaction between antibody and antigen, these methods are used to specifically identify target molecules in biologic complex samples. Their detection is possible using a label and a subsequent suitable detection method. Using antibodies labelled by metal-containing nanoparticles detected by Laser Ablation Inductively Coupled Plasma Mass Spectrometry (LA-ICP-MS), it is possible to detect the target antigen in samples and also to determine the elemental composition of the sample. Besides the amount of the element itself, the distribution of the element in the sample can also be analysed. Such an analysis could be useful, for instance, for cells and tissues used to study tumor microenvironments. The work deals with the binding of the DO-1 antibody, which recognizes the p53 protein, to 10nm gold nanoparticles. The resulting conjugates were used for antigen detection by western blot in cell lysates. The aim of this work was to optimize the western blot method using LA-ICP-MS detection for protein analysis in biological samples, to compare the method with the routinely used luminescence method, to detect the protein in different biologic samples and to show its advantages. Experimentally, suitable conditions were found for the western blot method using LA-ICP-MS for protein detection. The sensitivity of the method was demonstrated and the LA-ICP-MS seems to be a suitable method for quantification using appropriate protein standard.

**Awards Won:**