

# SINGLE-CELL AND HIGH-RESOLUTION ANALYSIS OF ELEMENTS IN CELLS AND TISSUE CULTURES USING LA-ICP-MS

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**Key words:** Single-cell analysis, bioimaging, LA-ICP-MS, High-resolution analysis

Nickel (Ni) and titanium (Ti) are most commonly used as joint replacements. In some cases, such as inflammation, bacterial infection or increased mechanical stress can cause these elements to be released and penetrate surrounding tissue or even accumulate in specific organs. Only a few methods can be used for the analysis of ultra concentrations of ions in animal fluids and tissue, but almost no one can also characterize the distribution of the ion. Even though laser ablation inductively coupled plasma spectrometry (LA-ICP-MS) is an analytical method for analyzing an inorganic sample, especially geological ones, today, it is being used more and more to determine the distribution of elements in different types of biological samples. Bioimaging using LA-ICP-MS can be used to clarify questions of biomedical research such as bioaccumulation and bioavailability of elements in the tissues and provides insight into the basic chemical composition of living organisms.<sup>1, 2</sup>

The main objective is to develop a method to determine the distribution of elements at the cellular level, which means a mapping with a resolution at the level of micrometers. From a chemical point of view, a high-sensitivity method for the determination of selected elements (Ni, Ti) in tissues or even in individual cells will be developed and the behavior of these ions in the animal organism will be characterized.

## References

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