

# Technical and technological perspective in tissue characterization by Electrical Impedance Spectroscopy

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In order to characterize biological tissues, electrical impedance measurement (often called bioimpedance) is used in different clinical fields and is considered among the most promising techniques.

The method of bioimpedance measurement is quite simple and fast, totally non-destructive and not bleeding. It has the ability to highlight anomalies in biological tissues by detecting changes in the impedance of the examined part of the body.

It, essentially, consists of the application of a low intensity electrical current injected at set frequencies into the body through surface electrodes, and in the measurement of the resulting voltage over a selected part of the body. Spectral impedance is defined as the complex relation between this voltage and the current computed for each considered frequency.

This keynote presents the progress of the research group now operating in different clinical area from the idea to utilize impedance measurements to characterize biological tissues to studies on the capability of EIS measurements to real clinical monitoring.

Impedance measurements have been successfully used to evaluate the bone integration of metallic implants, drug delivery and muscle electrical properties in different physiological conditions.

As technology up-to-date studies on measurement techniques and instrumentation are part of biomedical engineering work, different proof demonstrator and measurement lay out are designed and implemented.