

# ELECTRODYNAMIC INTROSCOPY

## Description

The developed technology - Electrodynamic Introscopy (EI) – opens a new direction of functional tomographic imaging. EI is based on the high-resolution (< 1mm) scanning of an area of interest with extremely low-intensive broadband electromagnetic field. The obtained multiparameter image chains are processed in real time with the aid of spectral, statistic and original methods of analyses. Thus, EI enables in vivo, non-invasive/nonionizing high-quality visualization&monitoring of the 3D dynamics of integral electrobiochemical parameters at tissue, cellular and sub-cellular levels in norm and pathology. Its utmost application is earlier cancer diagnosis and directed therapy, but EI can be also effectively applied for solving numerous pressing biomedical problems.

## Innovative Aspect and Main Advantages

The EI technology differs from known high-informative systems of functional imaging (first of all - PET) by its:

1. No ionizing radiation;
2. Sound cost/effectiveness (1-2 orders less), simple and fast investigation procedure;

3. Fundamentally different set of measurement parameters (which specifically made it firstly possible to in vivo monitor calcium waves of intercellular communication). EI also ensured discovery of a novel class of spatiotemporal electrophysiological phenomena, which may be specifically used as basically new tumor diagnostic criteria and input biofeedback data for developing effective methods of the directed therapy. For example, the EI technology makes it firstly possible to reveal /monitor areas of:

- mitochondrial abnormalities (see Fig.2, 3. Melanomas and nevi have been chosen as demonstrative objects because of their clearness);
- aerobic and anaerobic, i.e. malignant, type of tissue respiration, identify true tumor geometry with its microenvironment and preclinical distant micrometastases (< 1 mm)(see Fig. 2, 4).

## Areas of Application

Practically all medical disciplines, specifically: oncology - earlier diagnostics and targeted therapy (breast and skin cancers, proctology, gynaecology); inflammatory processes; mitochondrial diseases; pain visualization; real-time investigations of the organism response to various therapeutic/environmental factors; cosmetology.

## Stage of Development

Late stage (prototype of industrial sample).

A demonstration EI setup is available.

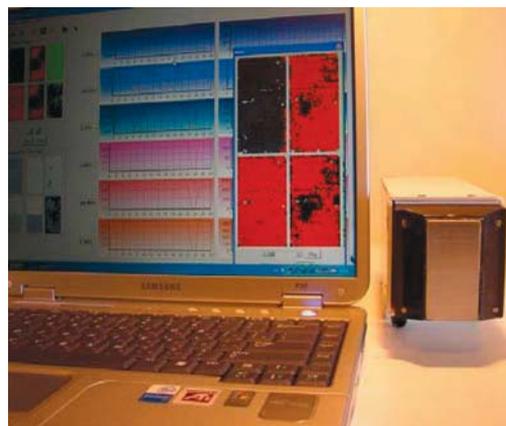


Fig.1. General view of the portable EI complex for investigation of external tissues



Fig.2. Photo of malignant melanoma region (impression of the scan-head 32x64mm can be seen).

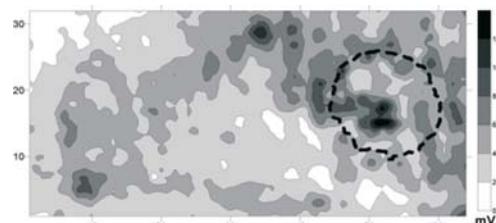


Fig.3. An EI pattern: mitochondrial abnormalities at the same region (the tumor visible boundary is marked with dotted line).

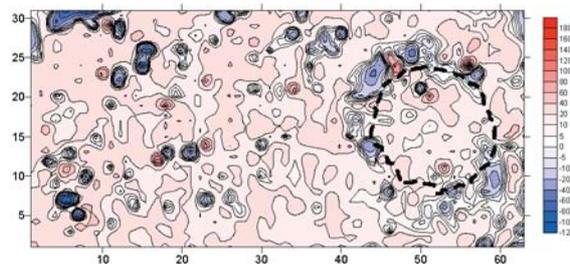


Fig.4. The same region. Another EI- pattern (intercellular level): metastatic process at the tumor microenvironment and distant areas (obtained in response to hypoxic test).

## Contact Details

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