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## The skin electro dynamic clustering: phenomenological study

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Visualization of the skin electrical landscape (SEL) remains a problem in spite of a large number of fragmented data supporting its diagnostic value. The developed method of the skin electrodynamic introscopy firstly enabled adequate SEL imaging, i.e.: its non-invasivity and high-enough resolution, which lead to discovery of a whole series of basically new phenomena of the skin patterning, specifically functional spatiotemporal clustering in parameters of spectral impedance. These phenomena supposedly reflect processes of intercellular (e.g. Ca<sup>++</sup>) signaling and cooperative metabolic processes happening at the cellular and sub-cellular levels in normal and pathologically changed tissue. Herewith, we present overview of our findings including detailed analysis of the SEL phenomena happening at the skin areas (32x32 and 32x64 mm) with melanoma and nevus. Non-thermal microwaves, weak magnetic field, and hypoxia were mainly used as test influences. It was shown that healthy skin can be characterised by chaotic low-amplitude dynamics, which is rather resistant to the applied influences. On the contrary, SEL of the areas with malignancies demonstrated extreme sensitivity and broad variety of initial and particularly test-induced transformations like, e.g., appearance of high-amplitude and large-scale clustering, which can spread far from the tumor visible margins. We believe that this technology and results may be used in various areas of biomedicine, e.g. for: earlier oncodiagnosics, personalized/controlled therapy, study of the influence of various environmental and pharmaceutical factors.

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