

Infrared spectral imaging and perspectives in cancer diagnostics

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Introduction: Benign cancer of vessels - Hemangioma occurs in 10-12 % of Caucasian children. There are 3 types of Hemangioma: Capillary, cavernous and mixed one. Despite the fact, that the identification different stages of hemangioma's are not problems, there is no single opinion about its origin that makes it difficult to classify and differentiate the Hemanangioma from other vessels cancer forms.

Aim: The experimental confirmation of preferable using of FTIR in diagnosis of children's Hemangioma.

Material and methods: To fix and make paraffin sections of post operational and biopsy tissue samples; Hematoxylin-Eosin tissue staining; immunohistochemical staining (Ki 67) and FTIR spectroscopy (Perkin Elmer Life Sciences, France). Retrieved spectrum was treated with Matlab 2008a.

Results and discussion: The research was held on capillary hemangioma samples received from 3 different patients, chose 3 different parts on each slide: 1. Skin portion, with typical proliferation activity; 2. Part with Hemangioma vessels; 3. Interstitial part.

The serial sections of each part for Hematoxylin-Eosin and immunohistochemical analysis against Ki 67 antibody were prepared.

Results showed that, all reviewed parts are actively proliferated. Although, only second and third parts have the similar absorption spectrum, however, both are presented with structurally and functionally different cells. The similar absorption spectrum of above mentioned parts indicate that second and third part, unlike the skin, are parts of benign cancer tissue, where the cells proliferate in an uncontrolled manner.

Conclusions: On the example of benign tumor tissue of vessels (children's Hemangioma) it has been established that:

1. Tissue parts with normal and uncontrolled growth of cells are characterized by distinctly different absorption spectrum of infrared rays.
2. The infrared spectral imaging can be used to identify and map the parts of the tissue with normal and uncontrolled growth of the cells.