

NATIONAL INSTITUTE OF RESEARCH AND DEVELOPMENT “VICTOR BABES”

1. Characterization and quantification of angiogenesis and proliferation in nanostructured polymer implants by immunohistochemistry Cristiana Tanase

Immuno-labelling with CD34 and EGFR reveals with accuracy the development of the vascular network in correlation with stage of the evolution.

The understanding of angiogenesis mechanisms in nanostructured polymers needs a better characterization of osteointegration in macro porous biomaterials.

Financed contract : CEEEX 42 Nanomed

2. Interactions of caveolin-1 and angiogenic markers – VEGF, bFGF – in human glioblastoma, Tanase Cristiana

VEGF and bFGF expression was revealed in all studied tumors, with a higher score in highly aggressive ones.

Caveolin-1 was expressed in some cases only in the endothelial cells and in others in endothelial and tumor cells.

The goal of these studies was to evaluate functional interrelation between caveolins and angiogenic markers, in glioblastoma tumorigenesis, that will be of major interest as possible therapy targets.

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3. Immunohistochemical analysis of Apaf 1 (apoptotic protease activating factor 1) and catB (cathepsin B) correlated with apoptosis in pituitary adenomas

Immunohistochemical analysis using anti Apaf-1 polyclonal antibodies evidenced that the expression of this protein has a trend that negatively correlates with proliferation factors.

The absence of Apaf-1 expression was demonstrated in the most of invasive adenoma with increased KI67 proliferative index.

In low invasivity adenoma Apaf-1 expression was variable, with zonal positivation.

Most of non-invasive adenoma presented positive Apaf-1 reaction, with zonal or diffuse aspect.

Catepsin B presented a diffuse intra-cytoplasmic aspect, with rare granular aspects at cytoplasmic membrane level, suggesting enzyme redistribution in cytosol and implication in apoptotic processes.

4. In vitro testing immunomodulatory effects of natural extracts formulated as nanostructured glycerol-water compounds

Several natural extracts formulated as nanostructured glycerol-water compounds were tested in vitro in order to select the presenting the optimum rate - bioactive efficacy for cosmetic applications / human health and ecosafety.

The level of immune and inflammation markers in peripheral blood mononuclear cells in experimental system in vitro indicate the immunomodulatory and anti-inflammatory effects of natural extracts tested.

The experimental data did not reveal cytotoxic or cytopathic effects of the products in this experimental model.

5. Innovative methods of photodynamic therapy with novel nanostructured photosensitizers

– from synthesis to clinical trial

The project aims to investigate the following issues:

1. Synthesis of photosensitizing porphyrin and phthalocyanine compounds, with defined photo-chemical and –physical properties for biomedical purpose
2. Conditioning of photosensitizers into hydrogels and supramolecular structures (nanoparticles) for improving their photosensitivity
3. In vitro toxicological studies using normal cells and neoplastic cell lines
4. In vivo toxicological studies using animal models of cancer
5. Clinical trial phase I on patients with dermatological forms of cancer.

Fundamental research will be performed for elucidating the action of the mentioned compounds at cellular level (cellular localization of photosensitizers, cellular apoptosis, and interference with the immune system).

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