

NANOSCAFFOLDS FOR BIOSYSTEMS SUPPORTING BIOLOGICAL PROCESSES FOR BIOMEDICAL AND BIOTECHNOLOGICAL PURPOSES

Ludomira Granicka, PhD, DSc

*Nalecz Institute of Biocybernetics and Biomedical Engineering, Polish Academy of Sciences
Department of Biomaterials and Biotechnological Systems
Laboratory of Engineering of Nanohybrid Regulation Biosystems*

Aim:

The aim of the proposed work is elaboration of the scaffolds for biologically active material (i. e. proteins, drugs and/or cells) immobilization and evaluation of produced system interaction with target cells.

Application:

The use of membrane nanoscaffolds can allow targeted and /or selective interaction with biological material regulating biological processes which may find direct biomedical and/or biotechnological applications.

A brief description of the work:

The implementation of the work is related to, among others the development of membrane nanoscaffolds, e.g. on the basis of hydrogels, their modification, examination of physicochemical properties, examination of cooperation with biologically active material, as well as the development of methodology of detection of the system.

Research will be carried out on the cells of selected cell lines, e.g. human fibroblasts. The structure and physicochemical parameters of membrane scaffolds in configuration with biologically active material will be analyzed.

The research envisages the use of spectroscopy, atomic force microscopy, electron microscopy and flow cytometry. The biosystem produced of nanoscaffold together with the incorporated biologically active material can be a means of anticancer activity or supporting the function of target cells.

The proposed project includes the following activities:

- construction of the nanoscaffold using selected polymers and nanoparticles;
- determination of the transport characteristics of the system, physicochemical stability of the membrane and membrane performance in a system with biologically active material;
- analysis of the function of target cells in the presence of the designed system.

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