

Recombinant vaccines, bioproducts and novel molecular diagnostics

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The title of the presentation represents research areas of the Intercollegiate Faculty of Biotechnology (ICB) in Gdansk. As the name “intercollegiate” suggests, the faculty belongs to two scientific institutions of Gdansk, the University of Gdansk and Medical Academy, which is the only faculty of this kind in Poland. The faculty, established in 1993, continues the tradition of the high level molecular biology introduced in Gdańsk initially by Prof. Karol Taylor. The eight research groups belonging at present to the faculty are involved both in fundamental and applied science. The main theme of research and educational activity of ICB is the application of molecular biology methods and technologies for biomedical purposes. The ICB research groups collaborate closely with other laboratories within both universities, and it was the basis of the establishment of EU funded Centre of Excellence named BioMobil. The students of the faculty take the advantage of the unique situation of ICB, participating in the courses offered by both universities.

The examples of biomedically-oriented research projects carried out at ICB include:

- Development and implementation of molecular diagnostic of human viral diseases (hepatitis B and C viruses, HIV, cytomegalovirus, human papillomavirus)
- Molecular studies on new photosensitizers applied in photodynamic method of cancer diagnostic and treatment
- Mechanisms of action of tumor necrosis factor (TNF) in vitro and in vivo
- Structural and functional studies of herpesvirus glycoproteins and search for viral proteins responsible for modulation of host immune response after infection with herpesviruses
- The use of viral vectors for construction of recombinant vaccines
- Studies of function and structure of hepatitis C virus glycoproteins - search for new methods of therapy
- The use of baculovirus expression system for protein expression (e.g. recombinant reagents for diagnostic kits)

The Department of Plant Protection and Biotechnology carries out several research projects, including the identification and differentiation of plant pathogenic bacteria, micropropagation of endangered plants (orchids and carnivorous plants) and studying plant tissue cultures as a source of pharmacologically important secondary metabolites. The remaining research subjects in ICB are more basic molecular biology projects, e.g. the studies of the role and mechanisms of the chaperone proteins action in different cellular processes or the analysis of broad-host-range plasmid DNA replication.

For the production and analysis of recombinant proteins various prokaryotic and eukaryotic expression systems are used in the ICB laboratories. Modern equipment like: FPLC, HPLC, stopped flow apparatus, fluoroimager, confocal laser microscope, sequencers and plasmon surface resonance apparatus Biacore 2000 is employed in the analysis of bioproducts.

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