

Research and Activities in the Protein Chemistry Laboratory of Jagiellonian University Faculty of Biotechnology

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The Protein Chemistry Laboratory is a modern and quickly developing institution on the field of biotechnology. We are conducting both the scientific research as well as offer specialistic services and products. The service and production part of our laboratory is separated as limited liability company named Biocentrum.

The scientific activity of the Protein Chemistry Laboratory is mainly directed toward isolation and characterization of the proteinase inhibitors and toward discovery of new antibacterial peptides. One of our latest scientific projects is focused on staphostatins, a novel family of the cysteine protease inhibitors from *Staphylococci*. These quite recently discovered small proteins have unique mechanism of action as well as distinct conformation of polypeptide chain. Still many of staphostatins features remain to be uncovered. Particularly interesting for us is the role of these inhibitors in virulence mechanisms of the pathogenic *Staphylococci* strains.

The second recently realized broad project of the Protein Chemistry Laboratory is focused on hemocidins. This name concerns a novel class of bactericidal and fungicidal peptides derived after limited proteolysis of heme-binding proteins, particularly hemoglobin and myoglobin. Hemocidins kill microorganisms in concentration range from several to tens of micromol/L. The studies on the mechanism of its action suggest that these peptides mimic action of the classical alpha-helical antibiotics, causing selective disruption of bacterial membranes via a “carpet-like” mechanism. Both production and application of hemocidins as drugs or conservants were claimed in patent and we are presently working on physiological significance of hemocidins in human body. Our recent results prove that hemocidins are intensively produced in female urogenital tract during menstruation and are an important unspecific bactericidal mechanisms that maintain human vaginal homeostasis.

The service and production part of our laboratory, acting under business name of Biocentrum Ltd, has three major areas of activity. The first field comprises specialized services in the area of protein chemistry. At competitive prices we offer automatic sequencing of proteins and peptides, amino acid analysis including gas-phase hydrolysis, preparation of HPLC peptide maps, 1D as well as 2D electrophoresis for proteomics and other. The second field of Biocentrum activity is focused on developing of monoclonal antibodies. We perform all steps in development of hybridoma cell lines and the obtained antibodies may be offered both as unprocessed cell culture medium as well as isotyped and purified monoclonal antibodies. Besides of monoclonal antibodies we offer also a variety of polyclonal ones, e.g. directed toward popular proteinase inhibitors from human blood.

The last area of company activity is production of highly purified proteins, proteinases and their protein inhibitors. We are a supplier of many world-wide companies as Sigma-Aldrich, Serva Electrophoresis and MP Biomedicals.

Our team is widely open for scientific and business cooperation. Highly qualified professional personnel as well as rich and often unique scientific equipment guarantees successful realization of many biotechnology projects.