



BioCentrum

PROTEIN CHEMISTRY SERVICES

BioCentrum

is a privately-owned biotechnology service and product provider from Kraków, Poland. Our goal is to provide a comprehensive set of research services, tailored to the client needs. One of our areas of expertise is the field of recombinant proteins production and biochemical analysis of proteins and peptides.

Production of recombinant proteins for research purposes

In vitro recombinant protein production is widely used for both scientific and therapeutic purposes. Our offer concerns the production of recombinant proteins in the prokaryotic systems (*Escherichia coli*, *Bacillus subtilis*) as well as eukaryotic yeast systems (*Pichia pastoris*, *Saccharomyces cerevisiae*). We aim to provide our clients with complete, innovative and cost-effective solutions in protein production

DESIGN OF GENETIC CONSTRUCTS

Based on biochemical properties of analysed protein, we design an optimal expression system allowing to obtain a fully active product. In addition, BioCentrum offers Clean-Cut system, which is a proprietary technology of fusion tag removal from recombinant proteins that brings all the advantages of currently available routines in a single, integrated solution.

EXPRESSION TESTS

We also offer expression tests which are intended to determine the optimal conditions for recombinant protein production, allowing to obtain the product with the highest possible efficiency. We optimize the spectrum of factors affecting the performance of recombinant protein production: time of expression, composition of media, temperature and concentration of inducers.

OPTIMIZATION OF THE PURIFICATION PROCESS

Optimization of the purification process includes both the recombinant proteins as well as the proteins isolated from biological sources. A versatile set of analytical and preparative columns for liquid chromatography (FPLC or HPLC systems) enables ion exchange chromatography, hydrophobic, reversed-phase and molecular filtration.

Biochemical analysis of proteins

In the field of protein and peptide biochemical studies, BioCentrum offers a broad spectrum of analysis: starting from principal electrophoretic and chromatographic techniques through ELISA tests to protein identification by mass spectrometry, amino acid compositions, terminal protein sequencing as well as structural determination by circular dichroism and X-Ray crystallography.

ELECTROPHORETIC PATTERN

Electrophoretic patterns and data on identity, homogeneity and purity can be obtained by SDS-PAGE electrophoresis. Additionally to SDS-PAGE 2D electrophoresis, IEF-SDS-PAGE and Western-Blot are also available.

LIQUID CHROMATOGRAPHY SERVICES

We offer a broad range of protein and peptide analysis based on low-, medium- and high-pressure liquid chromatography techniques. Both UV/VIS as well as fluorimetric detection is possible, while the broad range of analytic and semi analytic columns allow to perform ion-exchange, reverse-phase, hydrophobic and size-exclusion chromatography.

MS ANALYSIS (PEPTIDE MAPPING)

BioCentrum offers ability to identify unknown proteins using mass spectrometry techniques. Obtained results are subjected to analysis using Mascot bioinformatics databases.

AMINO ACID ANALYSIS

BioCentrum's laboratory offers amino acid analysis of both proteins and peptides. Samples are hydrolyzed in gas-phase using 6M HCl during 24 h at 115 Celsius. Released amino acids are converted to phenylthiocarbonyl (PTC) derivatives and analysed on PicoTag 3.9x150 mm column (Waters) installed on a Waters HPLC unit.

SEQUENCING OF PROTEINS AND PEPTIDES

Determinations of protein and peptide sequences are carried out using Edman chemistry on Applied Biosystems model 491 automatic sequencer. To better realize the specific expectations the analyses are performed in a close electronic contact with client.

ANALYSIS OF CD SPECTRA

Our company offers determination of the percentage of secondary structures of proteins (alpha-helices, beta-structures and unstructured regions) by circular dichroism method. Analysis is carried out on Jasco's spectrophotometer at wavelengths from 190 to 240 nm.

ELISA TESTS

BioCentrum offers optimization of ELISA conditions such as blocking and setting the time of incubation with antibodies. Analysis is performed using fluorimetric and spectrophotometric detection.

Crystallography

We offer contract research or implementation of joint research projects in the field of X-ray crystallography of biological macromolecules. We perform a full set of necessary experimentation (including crystallization, measurements and calculations), providing high-resolution tertiary structures of proteins in the free state and in complexes with low molecular weight ligands. In addition, we offer a comprehensive analysis of the results of the experiments involving characteristics of binding pocket and suggestions for further optimization of ligands, as well as docking ligands *in silico*.