

PROTEIN TECHNOLOGIES

RECOMBINANT PROTEIN TECHNOLOGIES AT YOUR FINGERTIPS

Proteins direct and catalyze nearly all the biochemistry of life, encompassing most aspects of cellular metabolism, movement, selective transport, signaling across membranes, replication, homeostasis, and communication between cells. At first, only particularly abundant proteins, that were amenable to purification by crystallization, were studied by biochemists. With more sophisticated fermentation and chromatographic purification techniques investigating less abundant enzymes and proteins became tractable. Today, recombinant protein technology has given us the means to biochemically investigate virtually any of the millions of proteins encoded by sequenced genomes.

The VBCF Protein Technology Facility (ProTech) draws on highly experienced staff to offer a range of services, for the production, purification and characterization of recombinant proteins. These include the design and cloning of expression constructs, the generation of constructs for multi-gene expression as well as the production of recombinant targets in bacteria, insect cells, and mammalian cells. We advise on the feasibility of production and affinity capture also at small scale. We offer scaling-up and custom-design chromatographic purification to yield a homogeneous protein preparation.

High-quality reagents provide a stable platform for subsequent investigations. Quality is crucial when experiments employ recombinant proteins, as preparations vary enormously in activity and purity. ProTech offers a suite of Quality Control instruments to determine if the final protein preparation meets the criteria expected for a native, well-folded protein. We have a range of instruments available for studying the biophysical properties of proteins, including their folding and interactions with other molecules.

In the very crowded environment of the cell, proteins rarely, if ever, operate alone but in complex with other proteins, macromolecules, and small molecules. ProTech has implemented several strategies for multi-gene expression and purification to meet the need to study such complexes. Moreover, within our suite of biophysical instruments are those dedicated to characterizing protein-protein interactions and protein interactions with nucleic acids or small molecules.

ProTech is proud to offer services and expertise at every step of the protein production and characterization process. Our vision is to maintain an efficient pipeline of services while constantly improving protein production and characterization technologies, allowing our users to carry out reliable and reproducible research with recombinant proteins.

VBCF PROTEIN TECHNOLOGIES TEAM



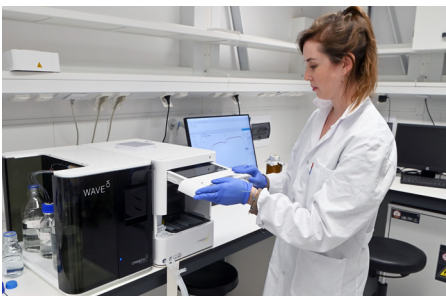
From left to right: Top row: Ricardo, Aranxa, Ivana, Orla, Bottom row: Jana, Gabriel, David, Arthur, Katharina

SERVICES AND METHODOLOGIES

- **Molecular Cloning**
 - Design and cloning of DNA constructs
 - Generation of DNA constructs for multi-gene expression of protein complexes
- **Recombinant Protein Production** (in *E. coli*, insect cells and mammalian cells)
- **Biophysical Characterization** (protein stability, oligomeric state, secondary structure, biomolecular interactions)

EQUIPMENT

- **Protein Purification** (Aekta Purifier, Aekta PURE system, Dionex Ultimate 3000 HPLC)
- **Biophysical Characterization**
 - Dynamic Light Scattering (DynaPro®)
 - Microscale Thermophoresis (Monolith NT)
 - Circular Dichroism (Chirascan Plus CD)
 - Differential Scanning Calorimetry (VP-DSC)
- Isothermal Titration Calorimetry (PEAQ-ITC)
- Size Exclusion Chromatography combined with light scattering and measurement of refractive index (OmniSEC)
- Affinity + kinetics of molecular interactions (Creoptix™ WAVEdelta)
- Protein fluorescence and scattering (NanoTemper Prometheus)



Core Scientist Orla operating the Creoptix Wave



Dionex Ultimate 3000 HPLC



VBCF ProTech team in action

CONTACT

Protein Technologies

Vienna BioCenter Core Facilities [VBCF]

<https://www.viennabiocenter.org/vbcf/protein-technologies/>

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