

Membrane Protein Services

40+ years of experience for your project

Our Protein services can be acquired in a modular system. That means that every step of your project is an individual part for us. Your project is entirely in your hands.



Module 1 PROTEIN EXPRESSION

Cell-free Systems

Hek293 cells

E. coli

Insect System



Module 2 PROTEIN SOLUBILIZATION

Detergents

Synthetic polymers



Module 3 PROTEIN STABILIZATION

Detergent

MSP Nanodiscs

Synthetic Nanodiscs &
Amphipols



Module 4 PROTEIN PURIFICATION

Protein specific
chromatography

Affinity chromatography
(Affinity tag)



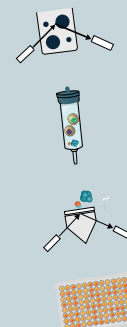
Module 5 PROTEIN CHARACTERIZATION

Dynamic light
scattering

Size exclusion
chromatography

Surface plasmon
resonance

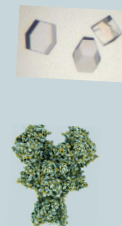
ELISA



Module 6 STRUCTURE DETERMINATION

Crystallization

Cryo-EM



Module 1 - Protein Expression:

We offer three different expression systems to you.

Cell free expression: A perfect match with pre-assembled nanodisc for membrane protein expression since it is an open system with no cell membrane. The membrane protein is co-translationally integrated into nanodisc. Recommended for toxic proteins and membrane proteins that need to be stabilized in all types of nanodiscs.

Baculovirus Insect system: The workhorse, for a higher output and shorter timelines than mammalian cells.

Hek293 cells: For homologue human protein expression and comprehensive post-translational modifications. We offer the BacMam system and transient transfection in Hek293 **suspension cultures**.

Module 2 - Protein solubilization:

The first step after a membrane protein has been successfully expressed by a cell or a cell free expression system is solubilize it.

Detergents: Highly pure materials, crystallization grade available. Detergent screens are our daily business.

Synthetic Polymers: New Substances called SMALPS, like DIBMA and SMA dissolve the cell membrane. They are similar to detergents, but simultaneously stabilizing the membrane protein later on through forming of a nanodisc with natural lipids.

Module 3 - Protein Stabilization:

This step is key when working with membrane proteins, this is Cube Biotech's unique competence.

Detergents: The traditional way to bring your membrane protein into solution. We offer a great choice of different detergents.

MSP Nanodiscs: MSP nanodiscs are disc shaped phospholipid accumulations that are held together by a membrane scaffolding protein (MSP, green). They mimic the cell membrane and keep the protein stable. You can transfer your detergent stabilized membrane protein into nanodisc.

Synthetic Nanodiscs: An innovative way, the synthetic polymer DIBMA or SMA have the capability to solubilize and stabilize a membrane protein. Therefore the protein remains surrounded by its natural lipid composition in a nanodisc. These complexes have never seen detergents at all.

Module 4 - Protein Purification:

The purification of (membrane) proteins of all organisms is one of the key expertise of our company. We are manufacturer of all kind of protein purification products, we even offer a customized solution for your purification project. Therefore we ensure that your protein will be of highest purity.

Surface affinities: Also called affinity tags the most commonly used way of protein purification. In our standard repertoire are purification products for the following affinity tags: His, GST Strep and especially for membrane proteins the antibody resin Rho1D4. Furthermore hydrophobic interaction (HIC) and Ion-Exchange resins are also in store if the affinity tag is not associable or even not existing.

Customized resin: In case you have a compound or interaction partner available, we can also synthesis a customized resin for you. Specialized to 100% for your project.

Size Exclusion Chromatography: At the end of all of our protein purification projects, a Size Exclusion Chromatography is performed to ensure the oligomeric state of the membrane protein.

Module 5 - Protein Characterization:

All previous modules aim to gain a protein for this step, to verify its quality and activity. We do offer **Dynamic light scattering (DLS)**, **Surface Plasmon resonance (SPR)** and **ELISA**.

Module 6 - Protein Structure determination:

To know the 3D structure of protein is immensely helpful to understand and possibly modify and regulate its functions. .

Crystallization: We offer vapor diffusion, lipidic cubic phase and as a combination of both the controlled in mesophase crystallization (CIMP). We have access to the PETRA III beamline in Hamburg.

Cryo-EM: This service is offered in cooperation, we will accompany you through the whole series of negative stain and Cryo-electron microscopy steps. Most of the time organized in feedback loops.