Fraunhofer IZI-BB

Our Technology for Your Innovations

Characterization of Toxins and Viral Proteins

Synthesizing toxins and viral proteins can be challenging in cell-based systems due to their toxic nature and the generation of high biosafety level organisms. Using cell-free protein synthesis we can circumvent these drawbacks. With no living cells to maintain, reactions can be safely adjusted, miniaturized, and parallelized, providing a practical route to high-throughput screening of toxic and viral proteins as well as variants.

We tailor production to deliver the quantities required for downstream applications. We can perform functional characterization in terms of hemolysis, pore formation, and cellular toxicity to optimize proteins for diagnostic uses, antibody or antidote tests, and assay development.

TRL-Level: 4
Open for R&D Collaboration

Key Features

- Scalable from small to large volumes
- No GMOs – no higher biosafety levels
- No purification, directly assay-ready
- Parallel analysis of mutants
- Ideal for high-throughput screening
- Testing of viral proteins and VLP formation

Industry

- Biotech
- Diagnostics
- Pharma-ceuticals
- Food & Water Safety
- Public Health & Biodefense

Applications

Synthesis and modification of toxins and viral proteins

- Template design, synthesis and protein analysis
- Mutational analysis based on PCR-templates
- Site-specific modification for fluorophore or compound coupling (e.g. for diagnostic or imaging approaches)

Downstream applications

- Identifying the active center of proteins
- Test inhibitors or antidotes
- Screen novel virus-like particles (VLPs)
- Development of nanopores

Further information

Ramm et al., 2024, Sci Rep 14:6043
Ramm et al., 2022, Frint Bioeng Biotechnol 10, 896751
Ramm et al., 2022, Toxins 14(4), 233

https://www.izi-bb.fraunhofer.de/en/for-industries/Drug-Discovery.html
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