



BIC

Biomolecular Interactions and Crystallization Core Facility

What we do

Bees in danger – Know the enemy

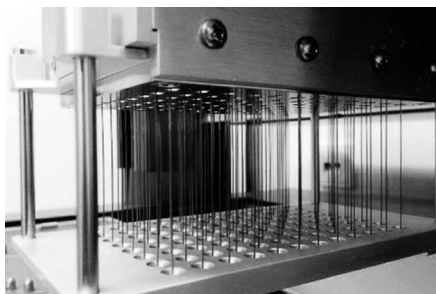
Detailed 3D-structure of bee virus. Researchers from the CEITEC Structural virology group investigated the structure of Israeli acute bee paralysis virus. Using a single batch of the isolated virus and screening of 1800 different crystallization conditions in CF BIC facility, they were able to produce two different forms of crystals – one containing the full viral particle and one composed of capsid protomers. Solving of both structures depicted uniqueness of this virus among the structural family and point out the key features for potential antiviral compound design.

Entrap pathogens into self-assembled net

Clustering of lectins from pathogens by multivalent inhibitors. The Glycobiology Research group from CEITEC in collaboration with Debrecen University in Hungary and help of CF BIC studied multivalent inhibitors of lectins – proteins that enable binding of pathogens to the host tissues. Combining ITC and SPR, they analysed the binding properties of inhibitors and lectins. Using analytical ultracentrifugation, they clearly proofed the ability of inhibitors to crosslink, cluster and aggregate these proteins. Increased avidity through multivalency makes these inhibitors a promising target for a drug development.

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Crystallization robotics

high speed set-up of crystallization plates due to combination of 96-head pipetting and non-contact nanodispensing of volumes down to 100 nL.



Surface Plasmon Resonance

monitoring of interaction in real time with one of binding partner immobilized on the surface of sensor chip while the second one is in solution.



Microscale Thermophoresis

measuring of changes in mobility of molecules in microscopic temperature gradient

Services Provided

We will help you with setting up experiments involving any SERVICE listed below. In addition, measurements using our EQUIPMENT are available within CF BIC.

Analytical ultracentrifugation services:

Analytical ultracentrifugation (AUC) can be used to analyze a broad variety of molecules in solution, often under biologically relevant conditions. Two methods are possible: sedimentation velocity technique (SV) provides hydrodynamic information about the size and shape of a molecule, while sedimentation equilibrium (SE) is one of the most accurate methods to determine the molecular weight.

Calorimetric services:

Calorimetry allows to obtain a complete thermodynamic profile of interaction in a single experiment. Numerous set-ups can be chosen, including possibility to use automated instrument (Auto-iTC200) or manual VP-ITC.

Crystallization services:

Crystallization is the crucial step for X-ray diffraction analysis to obtain the 3D structure of biomacromolecules and their complexes. We offer almost 3000 crystallization conditions in various set-ups, automated plate storage and imaging for regular plate inspection with online access to the data and wide range of optimization approaches (temperature, additives, detergents, heavy atom derivatization, etc).

Equipment

Interaction and stability studies

Biacore T200 (SPR), Auto-iTC200, Monolith NT.115 (MST), VP-DSC, VP-ITC, Prometheus NT.48 (DSF), XL-I analytical centrifuge, CD Jasco J-815, Delsa Max Core and Wyatt DLS Plate reader

Crystallization techniques

Mosquito, Phoenix, Dragonfly, automatic inspection and storage Minstrel HT UV + Gallery HT (4°C and 20°C), Centeo TG40

Contact and Location

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