EUROPEAN UNION

Interreg
Austria-Czech Republic
European Regional Development Fund

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 pointed out the key features for potential antivirotic compound design.

Entrap pathogens into self-assembled net

Clustering of lectins from pathogens by multivalent inhibitors. The Glycobiochemistry 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 proved 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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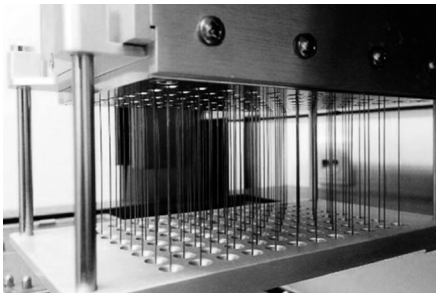

Crystallization robotics
high speed set-up of crystallization plates due to combination of 96-head pipetting and non-contact nanodispensing of volumes down to 100 nl.

Surface Plasmon Resonance
monitoring of interaction in real time with one binding partner immobilized on the surface of sensor chip and the other one in solution.

Microscale Thermophoresis
measuring of changes in mobility of molecules in microscopic temperature gradient, induced by the ligand binding.

Contact and Location

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Services Provided

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

Analytical ultracentrifugation services:

Analytical ultracentrifugation can be used for the characterization of (bio)molecules and their interactions in a solution. It can be used to determine the degree of sample heterogeneity, the shape and the molar mass of the particle, and the affinity and stoichiometry of the binding. Two complementary techniques (sedimentation velocity and sedimentation equilibrium) are offered by CF BIC as a service.

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).

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.

Equipment

Interaction and stability studies

Biacore T200 (SPR), Auto-iTC200, Monolith NT.115 (MST), VP-DSC, VP-ITC, Prometheus NT.48 (DSF), ProteomeLab XL-I analytical ultracentrifuge, 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

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