

**Lectures, Tuesday, June 15, morning****L6****STRUCTURAL BIOLOGY AT THE INSTITUTE OF BIOTECHNOLOGY AS CR****Bohdan Schneider**

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<http://www.structbio.eu/BS>*

Institute of Biotechnology AS CR, v.v.i. (IBT, <http://www.ibt.cas.cz/en>) was founded in 2008 as a new institute of the Academy of Sciences of the Czech Republic. The goal of the IBT is to conduct cutting-edge research on topics suitable for biotechnological and medical applications. A significant portion of IBT's programme is research of biotechnologically, diagnostically, and therapeutically important proteins by techniques of protein engineering and structural biology. IBT has currently two structure biology groups, one lead by Drs. Šebo and Malý, "Laboratory of protein ligand engineering", and the other lead by Cyril Bařinka, "Laboratory of Structural Biology". Both groups have expertise in fields of molecular and cell biology, biophysical measurements, X-ray crystallography, as well as bioinformatics and computer modeling. The focus of both groups is design, expression, and characterization of biomolecular, primarily protein, systems by biophysical techniques and determination of their structures by X-ray crystallography. Research projects of both groups are supported by various Czech and international grants and concentrate on development of novel proteins, e.g. ligands based on small protein scaffolds designed to bind to important eukaryotic proteins with high specificity and affinity. Several projects concentrate on controlled interference with various cytokine pathways, e.g. of interferon gamma or interleukin 23. Biophysical and bioinformatic approaches serve also the deeper understanding of the process of specific interaction of two biomolecules, their recognition.

Foundation of IBT has been an opportunity to concentrate a significant manpower into the underrepresented field of biotechnology, protein engineering, and structural biology under the roof of one organization. IBT has sufficient experimental as well as computer equipment to de-

sign, express, and purify prokaryotic and eukaryotic proteins, and allows their characterization by basic physical techniques as well as determination of their three dimensional structure by X-ray crystallography. Further expansion of scientific and application potential of the IBT scientific staff is however conditioned by construction of the planned new center BIOCEV, ("BIOtechnological Center Vestec", <http://www.biocev.eu/en>). BIOCEV is a planned joint research center of the Academy of Sciences and Charles University that is to be built at Vestec near Prague from the EU operational funds Research & Development for Innovations by the end of year 2012. In BIOCEV, structural biology section of IBT will be supported by the state-of-the art crystallization facility, equipment for diffraction experiments, and by laboratory for biophysical characterization of the studied biomolecular systems by spectral, thermodynamic, and kinetic measurements; the project should at least partially alleviate severe underfunding of crystallography in the Czech Republic. Integration of techniques in BIOCEV will enable the creative and expert scientific team of IBT to execute ambitious scientific projects based on structural biology, namely X-ray crystallography, electron microscopy, and various biophysical techniques.

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