

## **INSTITUTE OF BIOTECHNOLOGY OF THE ASCR, v. v. i.**

Biotechnologický ústav AV ČR, v. v. i. (BTÚ)

### **Section 5**

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The institute was founded on January 1<sup>st</sup>, 2008 by transformation of the Division of Biotechnology of the Institute of Molecular Genetics AS CR, v.v.i. to an independent legal entity, a public research institution according to the Czech Act no. 341/2005.

The primary ambition of this new institute is to develop cutting-edge basic and oriented research on topics opening for diagnostic and therapeutic applications in human medicine.

In particular, the institute was established to serve as a nucleation center of **BIOCEV**, a joined Biotechnology and Biomedical Research Center of the Academy of Sciences with Charles University that is under preparation for being built at Vestec near Prague by the year 2012, using the funds of the European Regional Development Funds under the Operational Program R&D for Innovation.

The Institute consists of 6 research groups operating in the following research fields:

- 1) Diagnostics for reproductive medicine (Head: Jana Pěkníková), characterizing processes and molecular players involved in egg fertilization process and developing tools (monoclonal antibodies) for detection of male infertility, as well as for detection of selected environmental pollutants with a negative effect on mammalian reproduction.
- 2) Diagnostics of autoimmune diseases (Head: Šárka Růžičková), focusing on humoral and genetic aspects in autoimmune diseases and identification of target molecules for therapeutic intervention and tools for new diagnostics for autoimmune diseases.
- 3) Molecular therapies (Head: Jiří Neužil), focusing on design and development of novel anti-cancer agents, in particular, vitamin E analogues efficient and selective for malignant cells, with a particular emphasis on molecular mechanism of apoptosis caused by such agents through mitochondrial destabilization.
- 4) Recombinant ligand engineering (Head: Peter Šebo), focusing on Design and rational improvement of high-affinity-binding recombinant ligand proteins for use in applications in which antibodies fail.
- 5) Chemical genetics (Head: Petr Bartůněk), focusing on assay development for high-throughput screening of compounds affecting functions of nuclear hormone receptors, growth factor receptors and cell cycle regulators.
- 6) Gene expression (Head: Mikael Kubista), developing tools for spatiotemporal analysis of gene expression by high-throughput quantitative real-time PCR

approaches on single cell and sub-cellular level, including multi-dimensional data analysis.

By 2009, two more groups will be established, focusing on computational and structural biology (i.e. modeling and solving of protein structures) and molecular markers and mechanisms of diabetic embryopathy.

The institute partners with the TATAA Biocenter Prague, co-organizing courses on gene expression profiling by qRT-PCR approaches. A particularly strong vocation of the new institute is to serve as a knowledge base for the nascent advanced biotech industry in the Czech Republic, where IBT is catalyzing the establishment of a Czech Biotech Cluster, centered around the biotechnology companies already having established their production sites at Vestec near Prague.

The nascent Czech Biotech Cluster is currently is open to all relevant human and veterinary vaccine producers, biotech companies using or producing recombinant proteins and/or focusing on tissue engineering, which are invited to join the undertaking.

Upon new recruitments in 2012, the IBT as part of BIOCEV in Vestec is expected to grow up to staff of 250 employees, aiming at conducting cutting-edge research in protein engineering, structural and cellular biology and immunology.

More detailed information about the organisational structure of the Institute and its research and specialised units can be found at the following URL:

**<http://www.ibp.cas.cz/en>**