

Institute of Biophysics CAS, v. v. i.

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Overview

The Institute was founded in 1955 as an independent unit of the Czechoslovak Academy of Sciences focusing on the research of physical properties of biological systems. This primary focus has been preserved until today, when the institute addresses a wide variety of research projects. Main research topics:

- spatial arrangement of DNA and chromosomes of the genome with respect to function, pathology and evolution of cells;
- reaction of DNA with proteins and anticancer substances containing metals;
- development of electrochemical biosensors for research and diagnosis;
- architecture of the cell nucleus, chromatin structure and modifications;
- relationships between cell differentiation and oncogenic transformation, influence of exogenous regulators of proliferation;
- DNA repair processes in living cells at the epigenome level
- transmission of cellular signals and changes in cytokinetics, effects of lipid constituents of nutrition and xenobiotics
- pathophysiological effects of reactive oxygen and nitrogen species
- computer simulations of the dynamic structure of biomolecules and their reactions with biologically active substances.

Organizational structure

The research activity takes place in 9 department, five of which are focused on molecular biophysics, three on cellular biophysics and one is theoretical.

Projects and grants

The institute coordinates: 1) three „Excellence projects“ focused on i) dynamics and organization of chromosomes in cell cycle and differentiation in normal and pathological conditions, ii) new approaches to bioactivity and molecular diagnosis, and iii) evolution and function of complex genomes in plants; 2) two projects within the Operational Programme Education for Competitiveness, focusing on development of human resources and modern trends in

experimental and cell biology. The Institute also addresses more than 60 projects funded by national and international grant agencies.

International cooperation

International cooperation is diverse - participation in two projects of the EU framework programs and many other international grant projects (COST, KONTAKT, etc.). The Institute cooperates with many foreign institutions and regularly organizes thematic international conference in the country.

Cooperation with universities

Cooperation with universities in teaching takes place both within the Biophysics Center (contract between MU Brno and IBP CAS) in the implementation of all forms of studies in biophysics and also in the implementation of doctoral programs (biophysics, genetics, physiology and developmental biology of animals, immunology and molecular and Cellular Biology) at the Faculty of Science of the Masaryk University under the granted co-accreditation. Researchers of the Institute are members of scientific advisory boards and councils of universities in Brno, Olomouc, Hradec Králové and Prague. Scientific research collaboration is carried out in joint projects of various grant agencies.

Public services

Public services are focused on technical expertise, particularly in the field of biomedicine, breeding and ecology, as well as engagement in public discussions on current topics and activities.

