

Technical Area: Biotechnologies, Agricultural Sciences and Medicine

Keywords: **molecular physiology, neurophysiology, and pathological physiology**



General Information

The Bogomolets Institute of Physiology (BIPh) is a leading scientific research center in Ukraine in the areas of molecular physiology, neurophysiology, and pathological physiology. BIPh of the National Academy of Sciences of Ukraine was founded in 1953 as a result of merger of the Institute of Experimental Biology and Pathology and the Institute of Clinical Physiology.

BIPh's organizational structure includes 3 divisions (Molecular Physiology, Neurophysiology, and Visceral Systems), each consisting of 4-5 departments, Laboratory of Molecular biophysics, and experimental facilities. In 1992 the Institute spun off the International Center for Molecular Physiology (headed by BIPh Director Acad. Platon Kostyuk), an "independent research organization" aimed to involve Ukrainian scientists in cutting edge research in cooperation with the world scientific community. The Center also engages scientists temporarily working abroad along with their host institutions in cooperative projects. The members of the Center's Council are prominent scientists from the USA, Germany, Italy, France. The Center is well equipped with advanced computer-based systems for cell characterization and image analysis, the result of successful participation in a number of grant competitions.

The Institute is a co-founder of International Astro Physical and Medico-Biological Scientific Centre in the Caucasus, Elbrus Mountain region (the Kabardin-Balkar Autonomous Republic, Russia), which has a well-equipped scientific base with laboratories, a vivarium, dwelling buildings and a sports centre. The Institute has a scientific medical base with laboratories, clinics, a vivarium and dwelling buildings in Truskavetz (the Carpathian Mountains).

The Institute has in its structure an experimental design factory, capable of making unique devices for medical and biological investigations and turn out a small number of new medical apparatus.

Institute's Focus

The Institute developed considerable core competencies in a number of areas of molecular physiology and related fields:

- molecular bio-physics
- mechanisms of membrane receptors activity
- nervous and muscular physiology
- neurophysiology and neurochemistry
- studies of visceral systems and neuronal networks under normal and pathological conditions
- preventive and rehabilitation treatment
- space medicine

Valuable Technology Offerings

The Institute also houses a facility for investigations in advanced cell biophysics and physiology. The facility is well equipped with confocal laser microscopes and scanner systems, multi-line Argon laser, Green Helium Neon laser, UV-Argon laser, etc.

Applied research at BIPh is concentrated in the areas of experimental cardiology, drug development (such as the domestically produced *Corvitin* for cardiovascular applications), vocational health issues (biophysical stimulation of osteogenesis, prevention and rehabilitation using non-traditional biophysical methods, such as cytotoxic sera, salt chambers, IR thermal chambers, cochlear halo-chambers, intermittent hypoxia training/treatment), and space medicine (microgravity effects on growth, structure, and functions of nervous and endocrine transformed cells).

Scientific Cooperation and Technology Transfer

BIPh is actively pursuing grant funding opportunities from a number of international granting agencies, such as INTAS, CRDF, Fogarty International Center, Wellcome Trust, Howard Hughes Medical Institute, DFG Foundation, STCU. Often, experimental projects are performed at the collaborators' sites (Saarland University; Dalhousie University; Georgetown University; Laboratoire de Physiologie Cellulaire, University of Science and Technology of Lille; University of Maryland; Department of Biochemistry, etc.). The Institute maintains dynamic relationships with a number of counterpart institutions in Europe including the National Center for Scientific Research (CNRS, France), Max Planck Institute for biophysical Chemistry (Germany); University of Liverpool, (United Kingdom); and many others.

The Institute worked jointly with the Institute of Nephrology, Institute of Gerontology, Institute of Endocrinology of the Academy of Medical Sciences of Ukraine to develop a number of therapeutic non-medicinal applications.

BIPh makes efforts to extend its outreach to domestic as well international industrial partners. In the Dnipropetrovsk branch there were collaborative research projects with AC "Debyut-Fidav" and a scientific-production company BIOTEK.

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