

The Institute of Biological Sciences, based on the modern research infrastructure operating within the Core Facility, conducts research in three main areas:

I. Human and animal health

Taking care of the health of people and animals has always been at the forefront of scientists' interests, especially in the face of new environmental threats related to global pollution and the spread of non-infectious diseases (such as cancer) and infectious diseases (including zoonotic ones).

The Institute of Biological Sciences conducts basic research in broadly understood human and animal health. Our researchers investigate immune mechanisms and ways to counteract infectious and non-infectious diseases. Medical achievements often come from previously conducted fundamental research, and linking basic science with clinical practice is a condition for progress in health care. Scientific activity in this area concerns (i) microbiology and immunology and (ii) human and animal diseases.

II. Environmental sciences

In recent decades, the importance of environmental sciences has been increasing. These sciences concern not only maintaining the biodiversity of the human environment but also learning about the evolution of biological mechanisms and counteracting environmental devastation. Science tries to answer how to ensure sustainable socio-economic development for us and future generations.

Our scientists' research fits perfectly into this strategy. We emphasize researching the structure of ecosystems, the local and global effects of human impact on their features, and understanding the mechanisms of adaptation of microorganisms, plants, and animals to inhabit areas polluted and degraded by human activity. We also work on biostimulating and bioprotective fungal and bacterial preparations used in various sectors of the economy and environmental protection. Our scientists specialize in researching pollinators vital to maintaining ecological balance.

An essential part of the research concerns using bacteria and fungi as biotechnological tools in industrial processes or in cleaning the natural environment. Understanding the natural biotransformation processes occurring in microorganisms in the natural environment allows us to develop a strategy for using bioprocesses in various areas of our lives. Scientific activity in this area concerns (i) bees and other pollinators, (ii) environmental research, (iii) sustainable agriculture, (iv) the use of bioprocessors, and (v) signal transduction in plants

III. Molecular biology

Exploring the molecular mechanisms of life has always been of interest to scientists. This is part of basic science but provides an excellent platform for developing biomedical sciences and industrial applications. Our scientists specialize in molecular research, including translational machinery, cellular transport, identification, and gene function and expression analysis, using a rich portfolio of modern genetic methods (including high-throughput) and protein bioengineering techniques. The leading topics in this area are primarily (i) molecular genetics and bacterial genomics and (ii) regulation of the expression of genetic information at the translation level.