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ORIGINAL PAPER

Ivan Málek and the Institute of Microbiology

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The history of the Institute of Microbiology began in 1948, when Professor Ivan Málek moved from Prague to the Faculty of Medicine of the Charles University at Hradec Králové. He formed a working group there that later became the basis of the Department of Microbiology of the Central Institute of Biology. After the Czechoslovak Academy of Sciences was founded in 1952, the group moved from Hradec Králové to Prague-Dejvice, Fleming Square, and the Department of Microbiology of the Institute of Biology of the Czechoslovak Academy of Sciences was thus established. The independent Institute of Microbiology of the Czechoslovak Academy of Sciences was founded in 1962. In 1963 it moved to the new building in Prague-Krč. In the beginning, the excellent reputation of the Institute of Microbiology was closely associated with Ivan Málek, its founder and first director. At the Institute of Microbiology, Málek's research focused mainly on continuous cultivation of microorganisms.

The Institute of Microbiology of the Academy of Sciences of the Czech Republic, v.v.i., currently has about 500 employees; of them, one-half are university-trained researchers. The Institute of Microbiology is one of the main institutions in the Czech Republic involved in basic microbiological research. Biochemistry, physiology and the molecular genetics of bacteria, yeasts, filamentous fungi and microscopic algae and immunological research are the main topics. In addition to basic research, the Institute is involved in a number of biotechnological applications.

Five divisions of the Institute reflect its main research areas.

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The main topics of interest of the *Division of Biogenesis and Biotechnology of Natural Compounds* are the physiology and genetics of mycelial actinomycetes producing secondary metabolites and the genetics, physiology and biotechnology of filamentous fungi. Other projects include work on the antibiotic resistance of bacteria, biotransformation of natural compounds and enzyme technologies. The Biotechnological Pilot Plant, which is involved in process engineering and optimization of microbial fermentations as well as production of biologically active compounds on a larger scale, is a part of the Division. The Division also includes the Laboratory of Molecular Structure Characterization equipped with top-quality modern mass spectrometers and the Center of DNA Sequencing.

The *Division of Cell and Molecular Microbiology* concentrates on research on the molecular biology and genetics of both prokaryotic and eukaryotic microorganisms. Regulation of gene expression, cell differentiation, and the effects of internal and external conditions on cell functions, mechanisms of cell aging, the significance of the cytoskeleton apparatus in cell division and molecular principles and bacterial pathogenicity are being investigated. The results obtained so far open methods for new industrial and biomedical applications.

The research program of the *Division of Ecology* includes complex physiological, biochemical and genetic characterization of fungal enzyme systems capable of biodegradation of pollutants, such as aromatic hydrocarbons. Interactions between mycorrhizal fungi and soil organic matter are also being investigated.

The origin and development of the immune response, functional characterization of components of the immune system and regulation of the immune response are studied at the *Division of Immunology and Gnotobiology*. Important results were obtained from research on autoimmune

Fig. 1 Ivan Málek (photo, Masaryk Institute and Archives ASCR)

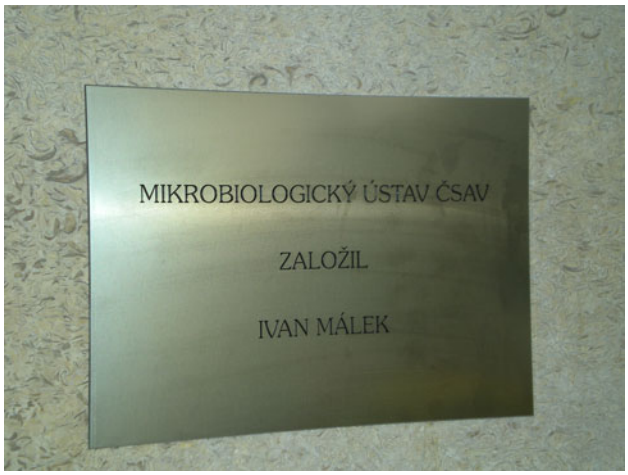

Fig. 2 Málek's memorial plaque

and cancer diseases. Targeted drugs utilizing polymeric carriers developed in close cooperation with the Institute of Macromolecular Chemistry of the Academy of Sciences of the Czech Republic, v.v.i., are one of the promising possibilities for antitumor treatment. One laboratory of the Division located in Nový Hrádek in East Bohemia uses the unique model of germ-free animals for the study of relationships between microorganisms and hosts.

The *Division of Autotrophic Microorganisms* is located at Opatovice Pond in Třeboň in South Bohemia. The research program of the Division includes the study of photosynthetic microorganisms, i.e. algae, cyanobacteria and other photosynthetic bacteria. One of the laboratories is involved in the technological production of algae, its optimization and processing of algal products, as well as in the development of different methods for the utilization of algal biomass.

In October 2009, The Masaryk Institute and Archives of the Academy of Sciences of the Czech Republic organized a conference to celebrate the centenary anniversary of Ivan Málek in collaboration with the Institute of Microbiology (Fig. 1). The topic of the conference was the scientific as well as social impact of Ivan Málek as a distinctive personality in Czech science. In honor of his contributions, a memorial plaque indicating that Ivan Málek founded the Institute of Microbiology was unveiled (Fig. 2).