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CHRONICLE

On the 70th Birthday of Yuri Aleksandrovich Trotsenko

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In July 2011, we celebrated the 70th birthday of Prof. Yuri Aleksandrovich Trotsenko, doctor of sciences (Biology), a member of the editorial board of our journal, who contributed greatly to the development of basic and applied research in methylotrophy.

Yuri Aleksandrovich is a shining example of a person entirely and sincerely devoted to science. He began his career in science in 1961 as a student of the Department of Plant Physiology at the Biological Faculty of Ural State University (UrSU, Sverdlovsk) under the supervision of V.V. Yurkevich, noted expert in evolutionary biochemistry. After graduation from UrSU, Trotsenko worked as an assistant at the Laboratory of Photosynthesis headed by A.T. Mokronosov and in 1964 began a postgraduate course of studies at the Department of Microbiology (Faculty of Biology and Soil Sciences of Moscow State University) where he worked on the physiology of green photosynthetic bacteria of the genus *Chlorobium* under the supervision of Prof. E.N. Kondratyeva. This outstanding trio of supervisors determined many respects of his development as a scientist, including the breadth of his scientific interests and his high standards of research quality. Upon completion of his postgraduate course, Trotsenko was employed as a junior researcher at the Institute of Biochemistry and Physiology of Microorganisms (Pushchino), where he was charged with the creation of a laboratory of radioactive isotopes, which he headed after defending his candidate's dissertation in 1970. At that time world science was characterized by rapid development in the fields of methano- and methylotrophy and there was great interest in the applied aspects of this research. The laboratory headed by Trotsenko was actively engaged in such work and, owing to the very high effectiveness of research, quickly became an international center for methylotrophy studies, retaining this status up to the present day.

Investigations into microbial C_1 metabolism by the research team of the laboratory headed by Trotsenko

reflect the main tendencies of world scientific development in this field of knowledge and encompass various aspects, including the study of cell ultrastructure, key enzymes, metabolic pathways, and ecology and activity of methylotrophs in natural and anthropogenic environments, as well as genome analysis and evaluation of the genetic and biotechnological potential of these microorganisms. The new dimension of these integrated studies was that the central objects were methylotrophic bacteria of extreme habitats: saline, alkaline, acidic, thermal, and cold ecosystems. These works laid the foundation of our knowledge on the diversity of existing ecotypes of extremophilic methano- and methylotrophs and the specificity of their metabolism.

The most important achievement of Trotsenko and his team has been their fundamental contribution to creation of a pool of in-depth knowledge on the biology of halophilic/halotolerant and thermophilic methylotrophs. This is one of the fields of microbiology in which the preeminent international standing of Russian scientists has been unconditionally recognized. Investigations of halophilic/tolerant methylotrophs revealed that they accumulate ectoine, a cyclic imino acid, as a major osmoprotectant. Further works made it possible to study in detail the basic properties and regulation of specific enzymes of ectoine biosynthesis, to decipher the structure and organization of genetic determinants of these enzymes, and to form a scientific and methodological platform for selection of efficient methylotrophic producers and development of new technologies for production of this multifunctional bioprotectant.

The contribution made by Trotsenko and his coworkers to the study of thermophilic methanotrophs was no less significant. They revealed the mechanisms of adaptation of thermophilic methanotrophs synthesizing sucrose as a thermoprotectant and carbon reserve, as well as determined the conditions and pathways for production of melanin-like pigments in thermotolerant methanotrophs. The studies of the physiological and cytobiochemical peculiarities of methylotrophic life at high temperatures, pH, and salinity made it possible to understand the universality of the main strategies of microbial thermo- and osmoadaptation and to develop approaches to implementation of the biotechnological potential of methylotrophic bacteria as producers of novel useful compounds: bioprotectants, biostimulators, stable enzymes, etc.

Trotsenko's scientific contribution is widely known both in Russia and abroad; he is an internationally recognized expert in the field of methylotrophy, a frequent speaker at the Gordon Research Conferences on the molecular bases of C_1 metabolism (United States), and a member of the International Scientific Consortium on the sequencing of genomes of methano- and methylotrophic bacteria.

The results of fundamental and applied studies performed by Trotsenko have been summarized in numerous scientific publications including, 5 books, a textbook, 350 articles, and 12 certificates of invention. The studies of Trotsenko and his coworkers have been awarded the D.K. Zabolotny prize of the Presidium of the National Academy of Sciences of Ukraine (1982) and the prize of MAIK Nauka/Interperiodika Publishers (1997, 2009, 2010) for series of articles in the journals *Microbiology* and *Applied Biochemistry and Microbiology*. The creative peak of his scientific activity has been a 20-year cycle of studies of the biology of extremophilic/tolerant methylotrophs and methylobacteria, which was awarded the S.N. Vinogradsky prize of the Presidium of the Russian Academy of Sciences in 2009.

One must also recognize the strong scientific school created by Trotsenko. He has supervised the preparation and defense of 2 doctoral, 28 cand. sci., and 18 master's dissertations, as well as quite a large number of large-scale target projects (the Russian Foundation for Basic Research, INTAS, Soros Foundation, RNP (the program of "Development of the Scientific Potential of Higher Schools" federal targeted programs). Trotsenko is a member of the editorial boards of the journals *Applied Biochemistry and Microbiology* and *Microbiology* and scientific and advisory councils. His personal traits include an unquenchable interest in the search for new scientific knowledge, immense vitality, and innovation in mastering and application of new methodologies for scientific research.

Noting the longstanding fruitful research activities of Yuri Aleksandrovich Trotsenko, the editorial board of the journal *Microbiology* wishes him sound health, personal well-being, inexhaustible energy, and new creative achievements.