

Igor Kulaev: A Life in Science (to the 70th Anniversary)



In March 2000, Igor Stepanovich Kulaev, the Head of the Department of Biochemistry of Microorganisms of the Skryabin Institute of Biochemistry and Physiology of Microorganisms, professor of the Department of Molecular Biology of the Faculty of Biology of Moscow State University, Doctor of Biology, a corresponding member of the Russian Academy of Sciences, celebrated his 70th anniversary.

Igor Kulaev was born in Moscow. He graduated from Moscow State University in 1953 and then became a postgraduate student at the Department of Plant Biochemistry (the Faculty of Biology) headed by Academician A.N. Belozerskii. Since January 1963, Igor Kulaev has been a professor in this department (presently the Department of Molecular Biology). Since June 1969, Kulaev has worked at the Skryabin Institute of Biochemistry and Physiology of Microorganisms as the Head of the Laboratory of Regulation of Biochemical Processes (presently the Department of Biochemistry of Microorganisms). He was awarded a

Candidate of Science degree in 1957 and a Doctor of Science in 1969. In 1970, Kulaev was awarded the title of professor.

In December 1987, he was elected a corresponding member of the Russian Academy of Sciences in biochemistry.

I.S. Kulaev is the author of more than 500 scientific publications, 3 monographs, and 10 inventions. He has 5 patents of the Russian Federation. Kulaev's monographs devoted to polyphosphates established his worldwide scientific reputation and are cited in almost all relevant publications.

The major achievements of I.S. Kulaev are concerned with the regulatory systems of microorganisms. He and his collaborators were the first to show the role of nucleotides in the regulation of yeast and fungal metabolism and to establish that orthophosphates and nucleotides in microbial cells occur primarily in the bound state. Many of Kulaev's works are devoted to the transport of phosphates and other ions in microorgan-

isms, as well as to the bioenergetics, enzymology, synthesis, and structure of the cell-wall polysaccharides and glycoproteins of yeasts and fungi. Investigations into the metabolism, localization, and physiological role of polyphosphates greatly contributed to the study of the evolution of bioenergetic systems in microorganisms, higher plants, and animals. With his coworkers, Kulaev showed the regulatory role of polyphosphates in the biosynthesis of glycoproteins, antibiotics, and alkaloids and revealed new pathways of the biosynthesis and energetics of polyphosphates in bacteria and yeasts. Some enzymes of polyphosphate metabolism that had been isolated and characterized in the laboratory of Kulaev were provided with EC (Enzyme Commission) numbers.

Many results of basic researches performed in Kulaev's laboratory were then used for biotechnological purposes. In particular, investigations of the biogenesis and degradation of the microbial cell wall laid the groundwork for the industrial production of cellulases, xylanases, pectinases, and invertases. Achievements in the study of microbial lysoamidase were then used for the creation of a synonymous remedy for treating purulent wounds, burns, and stomatic and other diseases. Many of the research efforts made by Kulaev and his collaborators have been concentrated on developing the

fundamentals of production of biodegradable plastics from microbial poly- β -hydrobutyrate.

The teaching activity of I.S. Kulaev is of great importance. He lectures students of the Faculty of Biology of Moscow State University on general biochemistry and the physiology of microorganisms. His pupils have defended more than 80 candidate of science dissertations and 19 doctoral dissertations.

I.S. Kulaev is an acknowledged leader and a founder of the microbial biochemistry scientific school. He is a scholar with an international reputation who is often invited, as an expert biochemist, to the United States, the United Kingdom, Germany, Japan, and other countries.

I.S. Kulaev is a member of the Presidia of Russian Biochemical and Microbiological Societies and the Presidium of the Research Biological Center. He works on the editorial boards of a number of Russian and international scientific journals. For many years, he has participated in the organization of many international biochemical and microbiological conferences.

The colleagues and pupils of I.S. Kulaev appreciate his skill, erudition, and benevolence and wish him health, long life, and further achievements in his scientific activity.

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