
CHRONICLE

The 75th Anniversary of the Department of Microbiology of Moscow State University

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The Department of Microbiology was created in 1924 within the Institute of Microbiology of Moscow State University to deal primarily with the problems of medical microbiology [1].

The reorganization of the Moscow State University in 1930 involved the establishment of the Faculty of Biology, while the Faculty of Medicine was removed from the jurisdiction of the University and transformed into the First Medical Institute (presently, the Sechenov Academy of Medicine). In 1933, the Institute of Microbiology became a department of the Faculty of Biology of Moscow State University.

In this paper, I shall dwell on the main developmental stages of the Department of Microbiology, which are closely associated with its chairmen.

For several years after the establishment of the Department of Microbiology, its first chairman, E.E. Uspenskii, in collaboration with S.I. Kuznetsov, L.P. Kryuchkova, and others was responsible for the formation of the Department staff and organization of educational and research processes.

The main research efforts of E.E. Uspenskii and his colleagues (S.I. Kuznetsov, D.M. Novogrudskii, and others) were concentrated on the study of microorganisms in nature (the scope of aquatic and agricultural microbiology) and the investigation of the influence of various environmental factors (primarily, pH and rH_2) on the energy metabolism of microorganisms.

E.E. Uspenskii headed the Department for 12 years (until his arrest in 1937). Over this period, the Department educated 86 graduates and 23 postgraduates [2]. Some of them later became distinguished microbiologists.

One such microbiologist is N.D. Ierusalimskii, who graduated from the Department in 1931 and began his scientific career as a researcher at the Central Research Chemico-Pharmaceutical Institute. Then, he joined the staff of the Central Research Laboratory of the Fermentation Industry. For a long time, Ierusalimskii worked at the Institute of Microbiology of the USSR Academy of Sciences. He was one of the founders and the first director of the Institute of Biochemistry and Physiology of Microorganisms in Pushchino. For about 20 years, he lectured on the nitrogen and vitamin metabolism of microorganisms at the Department of Microbiology of Moscow State University.

Then, I should mention S.I. Kuznetsov, a Corresponding Member of the USSR Academy of Sciences, who did his postgraduate work at the Department of Microbiology in 1928–1931 under the supervision of E.E. Uspenskii. For a long time, Kuznetsov worked at the Institute of Microbiology. Beginning in 1938, he lectured on soil and aquatic microbiology at the Department of Microbiology. When the University was evacuated from Moscow (1942–1943), Kuznetsov stayed there as the Head of the Department.

V.O. Tauson, a graduate from the Department of Natural Sciences of the Faculty of Physics and Mathematics, also did his postgraduate research under the supervision of E.E. Uspenskii. In 1932–1935, professor V.O. Tauson gave the course “Geological Activity of Microbes” to students of the Department.

I.L. Rabotnova, who graduated from the Department of Microbiology in 1935, received a postgraduate education first under the supervision of E.E. Uspenskii and then under V.N. Shaposhnikov. She was then invited to work at the Department and proceeded to pursue a successful scientific career.

D.M. Novogrudskii was one of the first graduates (1929) and postgraduates of the Department of Microbiology. From 1933 until his arrest in 1937, he was a senior lecturer at the Department and headed the Laboratory of Variability of Microorganisms at the Research Institute of Microbiology of Moscow State University.

One of the important achievements of the Department was the establishment of the scientific journal *Mikrobiologiya* in 1932. E.E. Uspenskii became the first Chief Editor of this journal. In 1937, Uspenskii was arrested, and the journal was passed to the authority of the USSR Academy of Sciences. I would like to note that its present Chief Editor is academician M.V. Ivanov, also a graduate from the Department of Microbiology of Moscow State University.

The next developmental period of the Department of Microbiology was associated with V.N. Shaposhnikov, one of the most distinguished scientists in the field of industrial microbiology. V.N. Shaposhnikov held the chair at the Department for 29 years, from 1938 to 1967 [2]. This period was marked by substantial advances in both the educational process and research work. In 1954, the Department, together with the Faculty of Biology, moved to a new building on Lenin Gory (pres-

ently, Vorob'evy Gory), where the laboratories were equipped with updated research facilities, providing an opportunity to carry out a wide range of research programs.

The department staff in those years included highly qualified teachers and skilled researchers, such as A.Ya. Manteifel, I.L. Rabotnova, G.A. Yarmola (Novikova after marriage), E.I. Kozlova, V.M. Kuznetsova, N.S. Egorov, I.T. Nette, M.N. Pimenova, N.N. Grechushkina, L.G. Azova, Zh.K. Loria, and others. The senior lecturers were professors V.N. Shaposhnikov and I.L. Rabotnova. Special courses were given by the prominent scientists N.D. Ierusalimskii, S.I. Kuznetsov, M.N. Meisel, M.A. Peshkov, P.I. Nikolaev, A.M. Bezborodov, and others. The research activity of the department staff was concentrated on the study of microbial metabolism and methods of their control for industrial and agricultural purposes. Since 1957, this research line has been among the most urgent problems of biology.

The study of antibiotics, another promising research line, has been underway at the Department since 1948. A year earlier, Shaposhnikov invited professor G.F. Gauze, a renowned specialist in antibiotics, to lecture on this topic to students of the fourth course. Since that time, studies along this line have been in progress in the Department of Microbiology. Over a 50-year period, the Department has trained about 800 specialists, many of whom deal with antibiotics. Nowadays, this work is under the leadership of professor N.S. Egorov, who has given the course "Antibiotics" since 1952.

Since 1950, phototrophic bacteria have become another subject of interest for Shaposhnikov and his coworkers at the Department of Microbiology. E.N. Kondrat'eva, who was greatly involved in the studies of these bacteria, later headed the work along this line.

In 1954, some members of the department staff began investigations of the physiology and biochemistry of propionic acid bacteria. Investigations along this line are now being continued by L.I. Vorob'eva and her collaborators.

In 1962, Egorov's group, encouraged by Shaposhnikov, initiated, for the first time in Russia, investigations of the microbial proteolytic enzymes possessing fibrinolytic, thrombolytic, and anticoagulating activities.

In 1950, Shaposhnikov's book "Industrial Microbiology," which was the first Russian treatise on industrial microbiology, was recognized by the Stalin Prize. V.N. Shaposhnikov has created a school of microbiologists, well known not only in Russia but also abroad. Many of his pupils have become prominent scientists, heads of research and educational institutions. Among them are full members of the USSR (presently, Russian) Academy of Sciences N.D. Ierusalimskii, M.V. Ivanov, E.N. Kondrat'eva, and G.A. Zavarzin; corresponding members S.I. Kuznetsov, G.I. Karavaiko, and V.M. Gorlenko, academician of the Acad-

emy of Sciences of Kazakhstan A.N. Ilyaletdinov, and academician of the Academy of Agricultural Sciences G.S. Muromtsev. During the years of Shaposhnikov's directorship (1938–1967), the Department trained 430 skilled microbiologists, many of whom defended candidate dissertations and 21 of whom received a doctoral degree; three of these doctors of science (I.L. Rabotnova, E.N. Kondratieva, and N.S. Egorov) were in the staff of the Department.

In 1967, V.N. Shaposhnikov (he was then 83) announced his retirement and advised I.G. Petrovskii, then the Dean of the Faculty of Biology and the President of the Moscow State University, to give the chair of the Department of Microbiology to his pupil and fellow coworker N.S. Egorov. In the same year, Egorov was appointed chairman of the Department and, at the same time, Deputy Minister of Higher and Secondary Education in the USSR [2]. By that time, the Department staff had only one doctor of sciences (Prof. E.N. Kondrat'eva), but it still provided good education.

N.S. Egorov has held the chair of the Department for 23 years, from 1967 to 1989. During that period, much work was done to improve the educational process and to develop research projects initiated by V.N. Shaposhnikov. The Department staff has been substantially enlarged. This made it possible to initiate new research projects, to involve students and post-graduates in the solution of important scientific problems, and to use the results of investigations in the educational process.

One of the two major groups of research programs of that period was associated with the microbial biosynthesis of biologically active compounds. First of all, this involved (a) investigation of the conditions of biosynthesis of some antibiotics; (b) investigation of the effect of antibiotics on their producers (leading researcher E.G. Toropova); (c) investigation of the mechanism of action of antibiotics (leading researchers V.K. Plakunov and A.N. Polin); and (d) investigation of mechanisms protecting producers from their own antibiotics. Extensive investigations along this line resulted in 35 candidate and 7 doctoral dissertations, as well as in numerous publications, including several monographs, text books, and manuals. Some interesting results were patented.

Much effort was concentrated on the problem of the microbial production of proteolytic enzymes possessing fibrinolytic, thrombolytic, and anticoagulating activities and of inhibitors of cholesterol synthesis.

In 1976, Egorov encouraged a group of researchers led by V.S. Danilov and A.D. Ismailov to begin investigations of luminescent bacteria, concentrating on the mechanism of luminescence and the role of luciferase. These studies are still in progress at the Department.

Noteworthy are also the study of the role of microbial exopolysaccharides and the investigation of the parasporal bodies of *Bacillus thuringiensis* and their possible application in practice.

The research group of N.N. Sukhareva studied some flagellates as producers of biologically active fatty acids and polysaccharides and their potential use in medicine.

The other group of research programs was associated with the investigation of the physiology and biochemistry of microorganisms, including the following topics:

(a) comparative investigation of the physiology and biochemistry of phototrophic microorganisms (leading researchers, E.N. Kondrat'eva and presently, R.N. Ivanovsky);

(b) investigation of the physiology and biochemistry of propionic acid bacteria, including the study of the cell ultrastructure, the genetics and ecology of these bacteria, and their ability to form antimutagenic factors (leading researcher L.I. Vorob'eva);

(c) investigation of the energy metabolism of anaerobic and aerobic methylotrophs, enzymes involved in methylotrophy, and the role of methylotrophs in the processes of formation of natural gas and oil oxidation at low temperatures (leading researcher A.I. Netrusov); and

(d) investigation of the structure and functions of teichoic acids in relation to the heterogeneity and dissociation of bacterial populations and the development of methods for their storage in the active state (leading researcher I.B. Naumova).

Over the period from 1967 to 1989, the Department graduated from 20 to 30 students annually, all of which were educated in microbiology by a group of highly qualified teachers: professors E.N. Kondrat'eva, L.I. Vorob'eva, and N.S. Egorov; senior lecturers I.T. Nette, M.N. Pimenova, N.N. Grechushkina, A.I. Netrusov, and Zh.K. Loria; and lecturers E.V. Semyonova, S.I. Myl'nikova, and L.G. Azova. When required, lecturers from other Moscow institutes were invited to give special courses.

During the years 1967–1989, the Department staff substantially enlarged and included, by the end of 1989, 10 doctors of sciences, 60 candidates of sciences, and

15 researchers without an academic degree. Over this period, the Department has educated more than 520 specialists, many of whom became candidates and doctors of sciences. The scientific achievements of some members of the Department staff have been recognized by awarding them with prestigious prizes. For instance, E.N. Kondrat'eva received the Lomonosov Prize, the Winogradsky Prize, and the State Prize of the USSR; N.S. Landau was awarded the Prize of the USSR Council of Ministers; and N.S. Egorov was awarded the Lomonosov Prize, the State Prize of the USSR, and the Prize of the USSR Council of Ministers. He also received the title "Honorary Scientist of the Russian Federation."

The list of works published by the Department staff during that period included numerous scientific papers, more than ten monographs, and a number of textbooks and manuals for students. Many scientific results were patented.

After Egorov's retirement in 1989, the chair of the Department was given to E.N. Kondrat'eva. That time was the period of the USSR's disintegration, a downfall in industry and agriculture, and the severe curtailment of scientific programs. As a result, the number of students and postgraduates at the Department of Microbiology was substantially reduced. Fortunately, during Kondrat'eva's directorship, the Department retained its major staff and research programs.

Since 1996, the chair of the Department of Microbiology has been held by Prof. A.I. Netrusov, who does his best not only to retain but also to further develop the scientific traditions that have been formed over the 75 years of the Department's existence.

REFERENCES

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