



Prof Dr Sc Marijan Bošnjak
(2 December 1934 – 11 February 2020)

On Tuesday, 11 February 2020, at the age of 86, our distinguished titular professor at the Faculty of Food Technology and Biotechnology, University of Zagreb, and *professor emeritus* of the Croatian Academy of Engineering, passed away. The funeral service was at Mirogoj Cemetery on 17 February 2020, where we said farewell to our honoured scientist and expert who had built a working career at PLIVA company.

Prof Dr Sc Marijan Bošnjak was born in Lovreč, on 2 December 1934, where he began attending elementary school (1941), finishing it later in Bjelovar (1946). He enrolled the Gymnasium in Bjelovar and Split, from which he graduated in 1954. In the same year he enrolled at the Department of Chemistry and Technology, Faculty of Engineering, University of Zagreb, and graduated in 1959. He took a job at PLIVA in 1960, where he worked for an entire working life, beginning at the Research Institute, to continue to establish, manage and improve the process of oxytetracycline biosynthesis from 1961 to 1968. During this period, he completed a series of three-month study visits abroad: in Poland to acquire practical knowledge of antibiotic production at a pharmaceutical factory in Krakow (1960/61), in Belgium at the Microbiology Research Laboratory of the Faculty of Medicine in Liege, at the CERIA Institute, the Institute for drug control and Emile Gryson Hygienic Institute in Brussels, Ghent and Gembloux (1964), and in the Czech Republic at the Microbiology Institute of the Czech Academy of Sciences in Prague (1967). These professional trainings had a positive effect on his professional skills and scientific achievements.

In addition to leading biotechnological production of oxytetracyclines, Prof Dr Sc Marijan Bošnjak was also in charge of plant department for conversion of D-sorbitol to L-sorbose at PLIVA company. By streamlining the system of continuous sterilization of nutrient media, he enabled economical biosynthesis of oxytetracycline on a large scale. He continued his professional and scientific work at the Research Institute until his retirement in 2000. By optimizing the antibiotic production plant and production technology, he had contributed to the recognition and progress of PLIVA within the global pharmaceutical industry. He received his master's degree in 1961 from the Biotechnology Department of the Faculty of Technology, and his PhD in 1973 (mentor Vera Johanides, *professor emeritus*) with the dissertation entitled 'Kinetics of oxytetracycline biosynthesis' at the Biotechnology Department of the Faculty of Technology, University of Zagreb, today's Faculty of Food Technology and Biotechnology, University of Zagreb.

In addition to these professional achievements, Prof Dr Sc Bošnjak participated in university education at the Faculty of Food Technology and Biotechnology, University of Zagreb, in the field of biochemical engineering and industrial microbiology, first as a visiting lecturer at graduate, then at the postgraduate studies, and finally as a titular professor at the Faculty of Food Technology and Biotechnology, University of Zagreb.

He is the author of about 100 scientific and professional papers published in the national and international journals and proceedings, one university textbook, three patents and a scientific book 'Introduction to the Kinetics of Microbial Processes' published in 2009. He participated in over 130 papers at national and international scientific and professional meetings.

Most of the scientific papers of Prof Dr Sc Marijan Bošnjak are based on his experimental work on the study of discontinuous and continuous bioprocesses. He mathematically defined the basic principles of

growth of the mycelial microorganisms, substrate consumption and metabolite formation, differentiation of the microbial population, autolysis kinetics, volatile precursor consumption, heat development, mixed microbial population growth during biotechnological surfactant degradation and growth kinetics of tumour spheroids. His laboratory research preceded the advancement of industrial biotechnological processes and significant savings in production costs. He demonstrated experimentally the benefits of continuous over discontinuous bioprocesses for the industrial production of several biotechnological products.

Numerous awards and recognitions that he received acknowledge his scientific and professional work in the field of biotechnology. He won the PLIVA Award three times, in 1969/70, 1987 and 1992. Other awards include the Croatian Technical Culture Award in 1987 for the 'Procedure for Obtaining Alkaline Proteinase from Fermented Substances' (with a group of authors), the Scientific Award Nikola Tesla (1988) in the field of Technical Sciences, the Croatian Academy of Engineering (HATZ) Award for Lifetime Achievement 'The Power of Knowledge' (2005), Acknowledgment of the HATZ, and the Acknowledgment of the Faculty of Food Technology and Biotechnology, University of Zagreb, for Personal Contribution to University Teaching. He was a member of the Board of Directors of the Rudjer Boskovic Institute and a member of the Editorial Board of the journals Chemistry in Industry and Chemical and Biochemical Engineering Quarterly, and a member of the Editorial Board of the journal Food Technology and Biotechnology. Apart from that, he worked in national and international, cultural, professional and scientific societies (Croatian Academy of Engineering, 'Matica Hrvatska', Croatian Paneuropean Union, Croatian Microbiological Society, Croatian Society of Chemical Engineers, Croatian Society of Biotechnology, Christian Academic Circle). On the initiative of Vera Johanides, *professor emeritus*, also served as a member of the General Board of the European Federation of Biotechnology (EFB) and of the EFB Task Force on Education. As a member of the organizing committees, he effectively participated in the organization of a series of scientific and professional conferences.

Encouraged by the events in our society and in the world in general, Prof Dr Sc Marijan Bošnjak responded with his articles in the media as a promoter of ethical conduct. As an erudite man, he had a distinct gift of expression in a written word. His wisdom and compassion for the concerns of others will remain in our eternal memory.



Prof Dr Sc Jagoda Šušković



Prof Dr Sc Blaženka Kos

Laboratory for Antibiotic, Enzyme, Probiotic and Starter Culture Technology
Department of Biochemical Engineering
Faculty of Food Technology and Biotechnology
University of Zagreb