

## *In Memoriam*

### **Professor Ana Savić (1936–2022)**

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In 2022 we celebrated half a century of the Serbian School of Molecular Biology. Molecular Biology and Physiology, as a novel study group, was founded in 1972 at the Department of Biological Sciences of the Faculty of Sciences and Mathematics, University of Belgrade. The University of Belgrade was the third university in the world to establish molecular biology studies and a department of biochemistry and molecular biology. The founder was the academician Dušan Kanazir, together with Ana Savić who was his only assistant at the time.

Professor Ana Savić started her teaching career after graduating in 1961 at the Department of Physical Chemistry of the Faculty of Sciences and Mathematics at the University of Belgrade. She received her PhD in 1972, and in 1973 she was elected Assistant Professor at the newly established study program Molecular Biology and Physiology. She conceived, designed and started teaching the course Fundamentals of Molecular Biology to the first generation of students. She was promoted to Associate Professor in 1982, and wrote an authorized peer-reviewed textbook, the first molecular biology textbook written in the Serbian language. Professor Ana Savić regularly revised and supplemented her scripts, keeping up with the accelerated development of molecular biology in the world. For years, these were the only source of molecular biological information in our native language. She made a great effort to speak



and write about molecular biology in Serbian and not to use English or English sentence constructions in Serbian. From 1988, Ana Savić's teaching activity significantly intensified and became more complex. In addition to the Fundamentals of Molecular Biology, she also taught Molecular Biology of Eukaryotes, as well as the postgraduate courses Biochemistry and Biophysics of Macromolecules, Physics and Chemistry of Biopolymers, and Selected Chapters in Molecular

Biology at the Department of Biological Sciences of the Faculty of Science and at the Center for Multidisciplinary Studies in Belgrade. In 1987 she was elected Head of the Department of Biochemistry and Molecular Biology at the Faculty of Biology, University of Belgrade. Ana Savić attained the status of Full Professor in 1991.

Ana Savić's career in scientific research started at the Radiobiology Laboratory of the Institute of Nuclear Sciences “Boris Kidrič” in Vinča. From 1970 to 1985, she was an associate of the Institute for Biological Research “Siniša Stanković”. She then joined the founders of the Institute of Molecular Genetics and Genetic Engineering and formed the new Laboratory for Molecular Biology in 1986, which she managed until her retirement in 2002. At the beginning of her scientific career, she was studying the effect of UV radiation on DNA molecules. She published her first research paper in 1965 in Russian in The Journal of the Academy of Sciences of

the former Soviet Union. For her doctoral dissertation, she investigated the molecular aspects of embryonic development and differentiation using sea urchins as the model system. Ana Savić gained considerable experimental experience as a visiting scientist in foreign laboratories including the Institute of Biochemistry and the Institute of Molecular Biology of the Soviet Academy of Sciences in Moscow, New York University at Stony Brook, and Amherst College. At Harvard University, she spent 2 years (1968-1970) in the laboratory of the distinguished professor Paul Doty where she did most of the experiments for her PhD dissertation. In Belgrade, she worked closely with Professor Dušan Kanazir and Dr. Vladimir Glišin, pioneers of molecular biology in Serbia. Professor Kanazir directed and supported her in the study of biomacromolecules – nucleic acids and proteins, while Dr. Glišin helped her decide to engage in the field of molecular embryology.

After becoming independent in her research and forming her own research group, Professor Ana Savić's scientific activity was oriented towards fundamental science and included several research topics. Applying the methodology of recombinant DNA, she studied the structure and function of the genetic material of higher organisms. She investigated various aspects of the structure and metabolism of chromatin and its components. Her scientific research interest included the determination of the local structure of DNA, the interactions of DNA and proteins, and DNA replication in eukaryotes. She also initiated research in the field of plant molecular biology, which included the analysis of buckwheat genes and their products. Professor Ana Savić made huge efforts to apply the experimental results in practice, especially in medicine, by introducing molecular diagnostics of human hereditary diseases, including cystic fibrosis, hemophilia and thrombophilia. Professor Ana Savić's laboratory was one of the first to introduce the method of paternity testing by analyzing DNA markers. She significantly contributed to laying the foundations of modern biomedical research in Serbia.

In addition to achieving a very rich and prolific teaching and scientific career, Professor Ana Savić was an exceptional person in every other respect. She was very devoted to her students and taught them in a specific way. She introduced molecular biology in Serbia at a time when this science was still in its infancy in the

world, and when communication means and access to information were incomparably less than those in the modern era of computers and the internet. Ana Savić successfully embraced the great challenge of establishing a new study group at the Faculty of Biology, which involved not only an extensive reform of the program but also a reorganization of the teaching system. It was a great joint effort for both the professors and first-generation students of molecular biology and physiology. With immense energy and determination, persistence, willpower and optimism which never left her, she managed to organize and conduct classes at an exceptionally high level, setting high criteria for herself and for the students. Her students were highly motivated to work, study and “dig” through hard-to-reach foreign scientific literature to clarify uncertainties and understand the essence of the studied problems because they would not want to appear unprepared in front of Professor Savić. Bright, very direct, witty and casual in her relationship with students, Ana Savić was a support, a professor to whom students could always turn, complain, seek help or a solution to a problem. For generations of students, she was a role model and a real authority – someone respected for her knowledge, work, honesty, human virtues and true values. If requested by students, she was always willing to postpone her own or another professor's exam for a week or two, saying: “It doesn't matter if you learn the subject by Wednesday or Friday, it's important that you learn it.”

As a very creative person, Professor Ana Savić introduced many original solutions in teaching, thereby successfully filling the gaps and shortcomings that arose with the establishment of a completely new study program. The innovation she particularly supported was the participation in the teaching of prominent scientists from scientific institutes, as well as of distinguished professors from other schools of the University of Belgrade. She was very keen on the idea that knowledge of certain scientific fields should be transferred to students by scientists and professors directly involved in that field. Thus, the students received first-hand knowledge from experts directly dealing in their own research with all the problems, challenges and perspectives of the scientific topics they were presenting to students. When she introduced the course Molecular Biology of Eukaryotes, which was an upgrade of the Fundamentals of Molecular Biology

course, Professor Ana Savić additionally improved the teaching methodology by introducing seminar papers that students prepared based on relevant up-to-date review articles and scientific papers. In this way, students were trained to read and follow original scientific literature in English. And this was set as a must-do for all future generations of molecular biology students.

To provide students with experimental skills, Professor Ana Savić organized visits to the laboratories of Belgrade institutes. Conversations with researchers and insight into their experiments gave students the opportunity to understand what it really means to “do science” and to experience the enthusiasm and creative atmosphere that reigned in those laboratories. For the first generations of students, she organized one-month working visits to the Institute of Marine Biology in Kotor, Montenegro, where students, under the supervision of Professor Ana Savić and her associates and

postgraduates, performed experiments, with in-depth preparation, careful execution and detailed analysis of the results. The work took place in a casual, relaxed and creative atmosphere in a laboratory with a large terrace over the sea, but the seriousness of the approach to experimental work at no point was questioned. Students “burned” in the laboratory “from morning to night”, and at the end they presented and discussed their results with all the professors and their colleagues at regular seminars held on the terrace. Kotor was our Cold Spring Harbor.

From Professor Ana Savić, we adopted the principles and moral frameworks of practicing science and being scientists. She taught us how to dedicate ourselves to science and nurture it as our lifestyle. We will remember her as a dignified and unassuming person, with an authority solely built on intellectual and moral qualities.