

In Memoriam

PROFESSOR STANKA ROMAC (1954–2015)

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Stanka Romac died suddenly on the 13th of December, aged 61. Stanka was a molecular biologist with a great international and national reputation. She studied for her undergraduate, MSc and PhD degrees in Molecular Biology at the University of Belgrade. She undertook her studies under the supervision of Prof. Dragutin Savić at Vinča Institute of Nuclear Sciences, Laboratory for Molecular Biology and Endocrinology, headed by Academician Dušan Kanazir who founded the Belgrade Molecular Biology School. In 1982 Stanka made her first international sortie and performed the experimental part of her PhD thesis in Paris in the laboratory of Prof. Duško Ehrlich, who was then at the University of Paris (Jussieu), in the field of gene recombination. Her studies here centered on the mechanism of recombination and transduction in M13 phage and pC194 plasmid [1], and presented some of the earliest evidence for single-strand DNA synthesis in a plasmid [2].

Stanka then decided to move to the US and undertook her postdoctoral studies with Prof. Franklin Hutchinson (known to his friends as “Hutch”) at the Dept. of Molecular Biophysics and Biochemistry at Yale. Hutch and Paul Howard-Flanders formed a very strong nucleus of researchers studying DNA repair and mutagenesis, from which many other leading exponents in this field emerged, such as Rick Wood and Steve West. Hutch and Paul, both physicists in their youth (Hutch had worked during WWII in the Radar lab at MIT and Paul on the Cyclotron at the Ham-



mersmith Hospital in London) were based in the north side of Yale, Science Hill, close to the Kline Tower, while on the south side, in the Medical School, were based other leaders in the same field, namely W. Dean Rupp, William Summers, Charles Radding and K. Brooks Low Jr.

At this time Stanka worked with her close friend Hilary Sockett and Phaik Leong in Hutch's laboratory and performed some very elegant experiments in which the UV- and MNNG-induced mutational spectra in prokaryotic (*E. coli*) and mammalian cells (Chinese Hamster Ovary, CHO) were compared. Stanka played a major role in the development of this system which involved the harvesting and analysis, at the nucleotide level, of mutations originating from a stably incorporated copy of the *E. coli* xanthine-guanine phosphoribosyl transferase *gpt* gene in CHO cells [3]. This led to one of the first published comparisons of mutation spectra between prokaryotic and mammalian cells that was entirely chromosomal in nature and did not rely on a gene located in a plasmid. The key development that made this study successful was the timely introduction of the polymerase chain reaction (PCR) technique, facilitating amplification of the mutated DNA, coupled with the design of specific ³²P-end labeled primers and extensive dideoxy Sanger sequencing (prior to sequencing automation, this was a real *tour de force*).

Life at this time was not all science, and many parties were enjoyed in New Haven. Hilary and Stan-

ka loved to find new jazz and music venues up and down the Connecticut seaboard and to take a group of us with them. Stanka enjoyed socializing and was the life and sole of a party, as well as greatly appreciating good literature, music and the Arts.

In 1989, Stanka decided to return to France, to work at the Institut Curie, but this was a very difficult time for her as it coincided with the breakup of Yugoslavia. She met Lazar at this time and returned to Belgrade where they got married. In 1993 Stanka joined the Faculty of Biology, Chair of Biochemistry and Molecular Biology, where she had been previously employed (1978-1985). She started her own research at the Dept. of Neurobiology, Institute for Biological Research "Siniša Stanković", and was involved in the project headed by Academician Ljubiša Rakić. In 1997, Stanka founded the center for the application and development of PCR at the Faculty of Biology (present-day Center for Human Molecular Genetics but still known as the PCR Center). Fascinated by the discovery of a new type of mutation (dynamic mutations), her research was focused on the molecular genetics and genotype-phenotype correlation of trinucleotide expansion disorders (e.g. Huntington's disease, fragile X syndrome, myotonic dystrophy) [4], and she worked in close collaboration with the well-known neurologists Academician Vladimir Kostić, Prof. Slobodan Apostolski and Prof. Slobodanka Todorović.

At this time, Stanka gathered together her first students and young scientists, establishing a strong scientific group led by her knowledge, enthusiasm and charisma. Her close coworkers from that time established their own research groups or went to work in laboratories around the world (Prof. Oliver Stojković, Head of the DNA Laboratory, Institute of Legal Medicine, Faculty of Medicine, University of Belgrade; Prof. Ivan Topisirović, McGill University and Investigator at the Lady Davis Institute, SMBD Jewish General Hospital; Dr. Biljana Čuljković, IRIC, University of Montreal; Dr. Slobodanka Orolicki, Centogene AG, Germany, to mention a few).

Stanka exerted a strong influence on the Serbian scientific community. She organized the first PCR

workshops to share her knowledge and skills, and the PCR Center was a place where many scientists from fields other than biology (medicine, agriculture, archaeology) learned how to apply PCR in their research; it was also a place of warm and inspiring socializing. Collaboration with Prof. Sofija Stefanović (Head of Laboratory for Bioarcheology, Faculty of Philosophy, University of Belgrade), who was a PhD student at that time, resulted in an innovative research program in the field of ancient DNA. Stanka's group performed a DNA-based sex identification of 7000-year-old remains of infants from the Lepenski Vir, which is an important Mesolithic archaeological site located in Serbia. To overcome a high degree of ancient DNA degradation, they invented a DNA modification by using poly(A) tailing as an efficient pretreatment for accurate PCR-based microsatellite genotyping of ancient DNA [5].

Stanka's research interest moved then to the molecular genetics of some other rare neurological and neuromuscular disorders (e.g. Rett syndrome, Parkinson's disease, hereditary neuropathies, spinal muscular atrophy, amyotrophic lateral sclerosis, progressive myoclonic epilepsies), studies in which many new mutations were described, some of them occurring with a high frequency in the Serbian population and probably arising from a founder event in this area of Europe. Stanka also introduced research related to the genetic predisposition to psychiatric disorders and prostate cancer after Prof. Goran Brajušković had joined her team.

Nine PhD theses and more than 20 MSc theses were done in the PCR Center under her supervision. Stanka was open-minded and completely devoted to her students and close collaborators. She used to discuss their results and how to overcome experimental problems almost every day. She had an informal but very stimulating relationship with them, and unselfishly shared her knowledge and experience. She had the sense to fully consider and support their ideas. I was really privileged to be her student and a close collaborator later on.

Her concept and vision for the PCR Center was for the execution of not only basic research, but also

applied science. She was a pioneer in applying PCR in clinical diagnostics [6], detection of plant viruses and for DNA evidence in the courts, and greatly contributed to development of medical and forensic genetics in Serbia. She was nominated by the Serbian Ministry of Justice in 1997 as an expert witness for legal medicine. For her achievements in applying DNA analysis, in 2008 the Serbian Chamber of Commerce and Industry and the Ministry of Science and Technological Development, Republic of Serbia presented her with the award of best technological innovation in the category of "Potencijali" (a prize awarded to a scientist and a research project with great potential). Stanka was also honored by the Faculty of Biology for the foundation of the PCR Center and the development of the concept of applied science in 2013. Many other centers were later founded at the faculty.

Beside her scientific work, Stanka was also dedicated to teaching. She lectured in courses in the Principles of Molecular Biology and from 1998 and the Molecular Biology of Eukaryotes. She always underscored the latest scientific discoveries in biology and biomedicine during her lectures, and this approach resulted in very motivating discussions for students. She also fulfilled other positions at the Faculty of Biology: Vice-dean of Science (1998–2001), Head of Chair of Biochemistry and Molecular Biology

(2004–2008), and Head of the postgraduate program in Molecular Biology and Biochemistry (1998–2006).

We shall all deeply miss Stanka, not only for her science but for her warm, honest and inspiring friendship and her wide smile.

We would like to thank Dr. Hilary Markey for invaluable details about Stanka's research at Yale.

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