

Preface

PROFESSOR IVANA WEYGAND-ĐURAŠEVIĆ, a distinguished Croatian biochemist, an inspiring teacher for many generations of students at the University of Zagreb, and a member of the Croatian Academy of Sciences and Arts, passed away on April 7th, 2014. With her premature death, the scientific community in Croatia and abroad lost a very dedicated and exceptional scholar and colleague.

Ivana Weygand-Đurašević graduated in Chemistry and earned a Ph.D. in Chemistry at the Faculty of Science, University of Zagreb. She spent most of her professional life at the Faculty of Science and was very proud of her scientific roots (“*PMF origin*”). In 1988, she became an assistant professor, followed by an associate professorship in 1995, and full professorship in 2000. She was elected as a Full member of the Croatian Academy of Sciences and Arts in 2012. She spent six years at Yale University in the group of professor Dieter Söll; three as a postdoc and three as a visiting fellow. Work in one of the top laboratories in the field significantly shaped Ivana as a scientist, enabled her to establish fruitful international collaborations, and helped her develop her own interests and research programs that she pursued with her group at the Faculty of Science in Zagreb for which she received international recognition.

Ivana devoted her scientific life to study the biochemical basis of components of protein biosynthesis machinery. From the early steps in her scientific journey to the very last days, she was involved in studies related to this fundamental cellular process. She moved back and forth between biophysical, biochemical and genetic approaches to understand mechanistic principles and biological relevance of aminoacylation; a reaction that is central for interpretation of the genetic code. In that reaction amino acids are covalently coupled to the corresponding cognate tRNAs and delivered to the ribosome where new proteins are synthesized. The main players in preparing amino acids for translation are aminoacyl-tRNA synthetases (aaRS), the enzymes that catalyze formation of aminoacyl-tRNAs with high accuracy. Ivana had a lifelong scientific fascination with the aminoacylation machinery of the cell. As a graduate student in Prof. Kučan’s Laboratory she used electron spin resonance to investigate conformational changes of tRNA during translation. Later on, with Dieter Söll she studied a

mechanism of how an induced fit conformational transition controls substrate selection in aaRS:tRNA complexes. Once established as a group leader in Zagreb she studied the fundamental principles of seryl-tRNA^{Ser} synthesis by seryl-tRNA synthetases in all three domains of life (bacteria, yeast, plants and methanogenic archaea). She contributed significantly to the field by elucidation of the structure and mechanism of atypical seryl-tRNA synthetase from methanogenic archaea and by revealing that seryl-tRNA synthetase can associate with the ribosome to increase the efficiency of tRNA aminoacylation in polysomes (tRNA channeling). She also discovered a novel group of enzymes related to aminoacyl-tRNA synthetases that aminoacylate carrier proteins instead of tRNA and thus provide a possible evolutionary link between ribosomal and non-ribosomal peptide synthesis.

Ivana’s scientific achievements were documented in more than 60 papers, most of them published in highly recognized journals. She had numerous national and international grants and established fruitful collaborations with many distinguished scientists in Croatia and abroad. Ivana introduced many generations of chemistry and molecular biology students to the fascinating world of biochemistry; under her mentorship more than 40 talented students earned their Master or Ph.D. degrees. She was admired by students and the best ones strived to carry out scientific research in her laboratory. She taught at undergraduate, graduate and doctoral levels and was highly engaged in the development of biochemistry within the Chemistry study programs. As a distinguished faculty member she also served in many academic functions at the Faculty of Science.

Her sudden death left many of her students, collaborators, colleagues and friends in grief. To honor her scientific legacy *Croatica Chemica Acta*, The Croatian Chemical Society, and Ivana’s close collaborators, colleagues and friends in Croatia and abroad, jointly participated in the realization of this Special Issue. The presented contributions are dedicated to the memory of her scientific brilliance, her endless enthusiasm and contagious love and passion for biochemistry. She has been an inspiration for all of us.

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