



Professor Branko Stanovnik: *Laudatio* for an 70th Birthday Collection of Papers

Professor Branko Stanovnik was born in Brezovica, Slovenia, on August 11, 1938. He studied chemistry at the Faculty of Chemistry and Chemical Technology, University of Ljubljana, Slovenia and in November 1963 he defended his Ph.D. thesis entitled »Thion-thiol tautomerism of some heterocyclic systems« under the supervision of Professor Miha Tišler. He spent one year (1964–1965) as a postdoctoral fellow at the Atlantic Regional Laboratory of National Research Council of Canada in Halifax, working with the team of Professor Gavin McInnes. Upon his return from Canada, he continued his academic career at the Faculty of Chemistry in Ljubljana, where he advanced to Assistant Professor (1964), Associate Professor (1967), and Full Professor (1972) as a permanent position. Numerous generations of students know Professor Stanovnik as an outstanding teacher and mentor who successfully managed teaching and research work. He has been supervisor to more than 200 diploma students and 30 PhD students; many of them achieved teaching positions at universities and leading positions in research laboratories. Professor Stanovnik was Head of Department of Chemistry and Chemical Technology, Faculty of Natural Sciences and Technology, University of Ljubljana (1967–1969), Head of Department of Organic Chemistry, Faculty of Natural Sciences and Technology, University of Ljubljana (1984–1989), and a vice-Dean of Faculty of Chemistry and Chemical Technology, University of Ljubljana (1992–1997). He was or still is a member of various committees of the University of Ljubljana, such as University Council, Committee for Postgraduate Studies, etc.

His research interest is mainly oriented to heterocyclic chemistry: synthesis, transformations, and structural investigations of heterocyclic systems, new reagents in heterocyclic chemistry, tautomerism of heterocyclic compounds, NMR studies, azido-tetrazolo isomerism, aza-transfer reactions, studies of heterocyclic diazo compounds and diazonium salts, 1,3-dipolar cycloadditions of diazoalkanes to pyridazines and further transformations of pyridazine-diazoalkane cycloadducts, chemistry of *N,N*-dimethylenaminones including their application in the synthesis of natural product analogues. His early work was focused on the chemistry of azaindolizines, *i.e.* azolo fused azines with a bridgehead nitrogen atom, with focus on the chemistry of fused pyridazines. New synthetic methods of preparation and reactivity of these azaindolizines were investigated. Within this context, studies on azido-tetrazolo isomerism of 6-azidotetrazolo[1,5-*b*]pyridazine derivatives should be highlighted. In addition to previous literature data, these studies provided new results on synthetic applicability and effects controlling the azido-tetrazolo isomerisation. The chemistry of heterocyclic diazo compounds, focused on the chemistry of α -diazoozoles and heterocyclic α -diazoketones, was another interesting area of his research which started in 1970-ies. Aza-transfer reactions, coupling reactions, photochemical reactions, Wolff-type rearrangements, synthesis of heterocycles, and other consequent synthetic applications were explored. These studies offered access to a variety of nitrogen substituted compounds and fused heterocycles and established heterocyclic diazo compounds as useful synthons. In the early 1980-ies, attempted methylation of 3-amino-6-chloropyridazine with excess diazomethane furnished the pyridazine-diazomethane cycloadduct instead of the *N*-methylated derivative. This was quite surprising, since only a few examples of cycloadditions to heteroaromatic systems were reported in the literature in that time. Further extensive study on 1,3-dipolar cycloadditions of diazoalkanes to pyridazine derivatives then showed that cycloadditions proceed under mild conditions regioselectively to the C=C double bond giving

the CH,CH-dihydro systems as the primary products, which can be isomerised selectively into NH,NH-dihydro and NH,CH-dihydro cycloadducts. The chemistry of these diazoalkane-pyridazine cycloadducts was also studied: sigmatropic rearrangements, oxidative aromatisations, elimination of nitrogen, ring opening, ring contractions and expansions, preparation and transformations of azomethine imines, etc. The latter reactions were also applied to stereoselective synthesis of acyclo *C*-nucleosides. In the last two decades, his research has focused mainly on alkyl 2-substituted 3-(dimethylamino)propenoates and analogous enamines. These easily available compounds turned out to be versatile reagents for the preparation of a variety of heterocyclic systems and in the synthesis of β -substituted- α,β -dehydro- α -amino derivatives and analogous compounds including natural product analogues, such as aplysinopsins and meridi-anins. Important analogues of 3-(dimethylamino)propenoates are 3-cyanopropenoates as useful dipolarophiles for 1,3-dipolar cycloaddition reactions.

Professor Stanovnik is author or co-author of over 600 publications. Among them, there are over 470 original scientific articles and many review articles, book chapters, monographs, and textbooks. As author or co-author he contributed chapters to *Advances in Heterocyclic Chemistry*, *Comprehensive Heterocyclic Chemistry*, *Comprehensive Organic Functional Group Transformations*, *Houben–Weyl Methods of Organic Chemistry*, *Methodum Chemicum*, *Organic Synthesis: Modern Trends*, *Progress in Heterocyclic Chemistry*, *Science of Synthesis: Houben–Weyl Methods of Molecular Transformations*, *The Chemistry of Heterocyclic Compounds*, and *Targets in Heterocyclic Systems*. He has been invited by numerous universities, academies, companies, and other scientific societies and research institutions to lecture about his research work. Let me just mention his lecturing tours in Great Britain (1971), USA (1974 and 1976), France (1976), Australia (1978), and in Republic of South Africa (1992). He has also been a plenary or invited speaker at numerous international symposia and conferences. He has given over 70 plenary and invited lectures at international conferences and symposia and almost 200 lectures at various universities, academies, and industrial research laboratories.

He was elected Visiting Fellow at the Australian National University, Canberra (1978), Fellow of the Royal Society of Chemistry, London, UK (1984), Full Member of European Academy of Sciences and Arts (*Academia Scientiarum et Artium Europaea*, 1991), Full Member of the Slovenian Academy of Sciences and Arts (SASA, 1991), Honorary

Member of Hungarian Chemical Society (1998), and Inaugural Honorary Member of the Florida Center for Heterocyclic Compounds (1998), and a Member of the Scientific Advisory Board for the Prohibition of Chemical Weapons, Haag, The Netherlands (1998). He also won numerous awards, recognitions, plaques, and diplomas from various universities, institutes, companies, and other institutions, such as the Boris Kidrič Fund Award for Science (1972), Honorary Medal and Diploma, Technical University Bratislava, Czechoslovakia (1975), Boris Kidrič Award and Medal for Science (1977), Boris Kidrič Fund Award for Innovations (1981 and 1989), Kametani Award (2006) for outstanding research in heterocyclic chemistry and contributions to the Heterocycles, Diploma and Plaque »In Memory of Professor A. N. Kost« (2007), and others. He is a member of many scientific societies, such as the International Society of Heterocyclic Chemistry, the Slovenian Chemical Society, the Chemical Society (London), the Swiss Chemical Society, the Federation of European Chemical Societies (FECS), the American Chemical Society, and others. In this connection, he also served or still serves at various boards and committees of the above mentioned scientific societies. Besides, he was or still is a member of international scientific committees of several congresses, symposia, and conferences, for example International Congresses of Heterocyclic Chemistry, International Symposia on the Chemistry and Pharmacology of Pyridazines, European Colloquia on Heterocyclic Chemistry, Blue Danube Symposia on Heterocyclic Chemistry, and others. Alone or with colleagues, he organised several national and international symposia or conferences including 16th European Colloquium on Heterocyclic Chemistry (1994), Graz-Ljubljana-Trieste Symposia on Organic Chemistry, TRISOC (1985, 1994), 4th International Symposium on the Chemistry and Pharmacology of Pyridazines (1994), the 8th and the 13th Blue Danube Symposium on Heterocyclic Chemistry (2000 and 2009), and others.

In connection with Professor Stanovnik's research work, a long-standing and fruitful co-operation with Professor Miha Tišler has to be mentioned. One should also emphasise, that numerous crystal structures of new heterocyclic compounds have been solved by Professors Ljubo Golič (†2007), Ivan Leban, Anton Meden, and Dr. Amalija Golobič. One should also acknowledge long-standing friendship, co-operation, and support from Professors Jerald S. Bradshaw, Raymond N. Castle (†1999), and Alan R. Katritzky. He also has many friends at universities and institutes throughout the world.

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