

Prof. Dr. Richard R Schmidt**A tribute**

Dedicated to Prof. (em.) Dr. Richard R. Schmidt, a renowned Scientist and Professor at the University of Konstanz, Germany, to honour and celebrate his 78th birthday

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Richard R. Schmidt was born on 14 May 1935 in Schwaebisch Hall, Germany. He received his Diploma in chemistry in 1960 from the University of Stuttgart where, from 1955, he studied chemistry on a fellowship from the Studienstiftung des Deutschen Volkes. He received his Ph.D. in 1962 for a thesis entitled, "Investigations on Vinyl Homologues of Carboxylic and Carbonic Acid Derivatives – New Quinone Methides" in 1962 under the supervision of Professor Rudolf Gompper. After a postdoctoral fellowship with Prof. Frank M. Huennekens at the Scripps Research Institute, La Jolla/California on coenzyme B₁₂ studies in biochemistry, he returned to Stuttgart to complete his habilitation on "Polar 1,4-Cycloadditions – a New Synthesis Principle" and to develop his independent research work. He has held the chair of chemistry at the University of Konstanz since 1975 where he served as Head of Department (twice), Dean of Faculty (twice) and Vice president of the University; he has been Emeritus Professor since 2003.

The scientific work of the Schmidt group has been documented in over 630 articles in peer-reviewed journals, in many filed and issued patents and in numerous invited lectures at national and international conferences.

Early work was devoted to the development of new (now classic) concepts in organic synthesis, including for instance, *polar cycloadditions*, *generation of functionally substituted vinyl carbanions*, *heterocyclic 8 π -systems*, and *de novo-synthesis of carbohydrates*. Since the late 1970s, his research group has concentrated on synthetic procedures for compounds occurring in cells and particularly in cell membranes and cell walls. The group received especially high

credit for the design of new glycoside bond formation methodologies, such as *anomeric O-alkylation*, introduction of *O-glycosyl trichloroacetimidates*, *O-glycosyl phosphites* and *nitroglycals* as glycosyl donors that are amenable to catalysis, the development of new concepts for *intramolecular glycoside bond formation* and work on *solid phase oligosaccharide synthesis* and *anomeric diastereocontrol*. These methodologies were applied to the successful synthesis of *glycolipids* (surfactants, saponins, resin glycosides, cancer vaccine adjuvants, etc.), *glycosphingolipids* and their constituents and *glycophospholipids* (lipid A and Kdo- and Ko-linked derivatives, GPI anchors, phosphatidylinositol mannosides and most recently lipoteichoic acids occurring in Gram-positive bacterial cell walls). The methodologies provided efficient access to *O*-, *N*- and *C*-glycosyl amino acids permitting the synthesis of derived *glycopeptides*, *glyco peptidolipids* (for instance murein fragments of bacterial cell walls) and *glycophospho peptidolipids*. The work also resulted in *glycoprotein* syntheses that required molecular biology methods including extension of the genetic code. Several challenging syntheses were completed in his lab. Collaborations with various research groups led to the successful evaluation of the physical, biological and medicinal properties of many target molecules made available by this synthetic work. In addition, the design of new types of *glycosidase* and *glycosyltransferase inhibitors* provided very efficient inhibitors of various enzymes, particularly of sialyltransferases.

Richard Schmidt was Guest Professor at the University of Tel Aviv/Israel, the University of Gifu/Japan and the University College Dublin/Ireland and he is a Honorary Professor of the University of Shenyang/China. He has received several prestigious fellowships and has been appointed to chairs in organic chemistry at the University of Heidelberg (1979) and the University of Mainz (1981). Among other awards Richard Schmidt received the Karl Winnacker Fellowship (1972-1975), the Prize commemorating Carl Duisberg (1974) and the Emil Fischer Medal (1995) of the German Chemical Society. The Royal Chemical Society honoured him with the Haworth Memorial Medal and Lectureship (2005) and the European Carbohydrate Organisation with the first Emil Fischer Carbohydrate Award (2009). In 2011 he received the Claude S. Hudson Award for Carbohydrate Chemistry from the American Chemical Society.

Prof. Schmidt enjoys reading scientific journals and writing. He has been interested in music since his school days. He has a great interest and respect for culture, festivals and traditions of other nations. I have greatly enjoyed the chemistry of Prof. Schmidt and consider myself fortunate to have been a part of his Research Group. For every completed problem on organic chemistry, he has a very simple and easy answer. The awards and fellowships that he has received during his scientific career will receive greater recognition through his name and he is a source of inspiration for scientists and scholar workers in the area of organic chemistry. His never ending enthusiasm for research and chemistry has not only inspired me, but has also enlightened all of his group members and other researchers working worldwide in the area of organic chemistry, all of whom congratulate Prof. Richard R Schmidt on his upcoming 78th birthday.

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