PREFACE

Professor Dr. Dr. h. c. Ekkehard Winterfeldt

Ekkehard Winterfeldt (Figure 1), professor of organic chemistry at the Leibniz University of Hannover (Germany), is an internationally renowned scientist in the area of synthetic organic chemistry and natural product chemistry. His contributions to research span from the development of novel synthetic methodologies and reagents to the total synthesis of complex natural products and include important milestones in the field. Beyond research Ekkehard Winterfeldt has also been a leader in several other capacities within the scientific community over many years. Most importantly, I would like to highlight his remarkable ability to communicate his fascination for science to his many co-workers (diploma students, Ph.D. students and postdoctoral researchers) who had the pleasure to be part of his team.

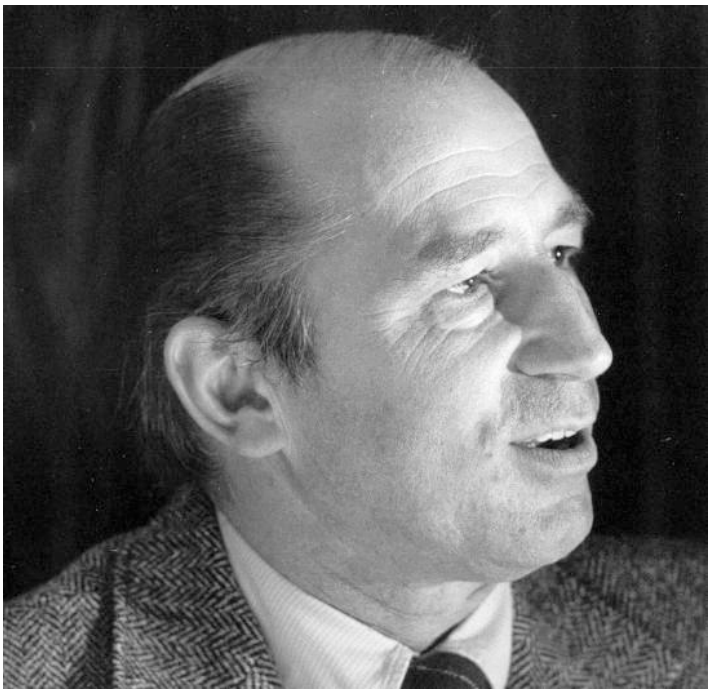

Figure 1. Ekkehard Winterfeldt – portrait (courtesy of Dr. Karl-Heinz Marx, Dietzenbach, Germany).

Ekkehard Winterfeldt was born on May 13 in the year 1932, the son of a teacher, Herbert Winterfeldt, and his wife, Herta, in Danzig (today Gdansk, Poland). After the war the family moved to Schleswig-Holstein

in north-western Germany, where he finished his schooling in 1952. In the same year he started his studies in chemistry at the University of Hamburg and, after moving to the Technical University of Braunschweig, he obtained his diploma degree in chemistry in the winter semester of 1955/56. With his diploma thesis on the "Synthesis of Önanthotoxin" in the research group of the well-known natural product chemist Ferdinand Bohlmann, he became acquainted with the field of natural product chemistry. Here he also completed his Ph.D. thesis on the "Synthesis of Hydroxy-Sparteins" within two years (May 1958). In the same year he married his wife, Marianne, with whom he has two children.

Following his Ph.D., Ekkehard Winterfeldt worked for one year at Bayer AG in Leverkusen until early 1959 when he followed his academic mentor, Ferdinand Bohlmann, to the Technical University of Berlin. In Berlin he investigated lupin alkaloids and worked on the synthesis of *Rauwolfia* alkaloids. His habilitation on the "Elucidation of the Constitution and Synthesis of a Naturally Occurring Thiophene Compound" was completed in 1962 and five years later, he became professor at the Technical University of Berlin. His main research field was the chemistry of alkaloids and by developing novel synthetic strategies he succeeded in the first striking total syntheses of indole alkaloids, such as akuammigine, tetrahydroalstonine and ajmalicine. Moreover, he investigated the reactivity and applications of acceptor-substituted acetylene compounds (*Angew. Chem.*, 1967, **79**, 389; *Angew. Chem.*, *Int. Ed. Engl.*, 1967, **6**, 423).

In the year 1969, Ekkehard Winterfeldt received offers for professorships from the universities of Berlin, Hannover and Marburg and in the following year he accepted the chair of organic chemistry at the University of Hannover. Here, together with his research group, he achieved numerous pioneering results by establishing novel methods for the synthesis of alkaloids. For the total synthesis of the pyrroloquinoline alkaloid camptothecin, Ekkehard Winterfeldt developed an unprecedented copper(II)-catalyzed autoxidation. Furthermore, in the imaginative total syntheses of indole alkaloids belonging to the *Corynanthe* group (geissoschizine, geissoschizol and isositsirikine), he utilized a novel domino reaction by combination of Michael addition of an aminocrotonate to a conjugated unsaturated aldehyde followed by stereoselective Pictet-Spengler cyclization and the stereospecific Ferles-lactam rearrangement of indoloquinolizidines as spectacular key-steps. All these syntheses have also been successfully performed in an enantioselective manner (*Liebigs Ann. Chem.*, 1985, 1752).

The reducing agent diisobutylaluminum hydride and its application to the selective reduction of esters to aldehydes will always be connected with his name through his excellent review on the subject (*Synthesis*, 1975, 617). For the biomimetic synthesis of histrionicotoxin, an alkaloid obtained from the poisonous

secretion of South American frogs, he investigated novel stereoselective cyclization reactions to functionalized spiropiperidines. Moreover, Ekkehard Winterfeldt developed a highly flexible procedure for elegant syntheses of biologically active cyclopentanoid natural products, like guaianolide sesquiterpenes, triquinanes, prostaglandins, carbacyclins and macrolides (*Angew. Chem.*, 1982, **94**, 496; *Angew. Chem.*, *Int. Ed. Engl.*, 1982, **21**, 480). The general synthetic concept of this approach is based on a stereoselective double Michael addition at 4-acetoxycyclopenten-2-one, serving as a stable synthetic equivalent for cyclopentadienone. This synthetic procedure paved the way for the three-component coupling to prostaglandins exploited by other groups later on. Ekkehard Winterfeldt and his research team applied the cyclopentanone annelation to an enantioselective total synthesis of the macrolide antibiotic brefeldine A.

What may be most astonishing to those who do not know Ekkehard Winterfeldt personally, is the fact that despite all the academic and administrative duties, he was still active in the laboratory throughout his whole career (Figure 2). In doing so he maintained close contact with his co-workers and this has been always very important to him, as he enjoyed an intense interaction with his team and usually joined all Ph.D. parties (Figure 3).

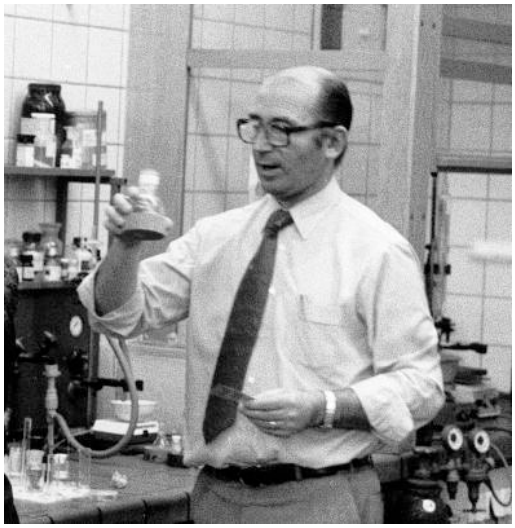

Figure 2. Ekkehard Winterfeldt at work in the lab (courtesy of Dr. Karl-Heinz Marx, Dietzenbach, Germany).

Figure 3. Ekkehard Winterfeldt enjoying the scene (courtesy of Dr. Karl-Heinz Marx, Dietzenbach, Germany).

In another research project Ekkehard Winterfeldt developed a brilliant approach to ansa-steroid compounds, which were obtained by a Lewis acid-induced Diels-Alder/retro-Diels-Alder cycloaddition of ergosterol and propargylic aldehyde (*Tetrahedron Lett.*, 1985, **26**, 1705). This reaction sequence unravels the whole hydrophenanthrene backbone of the steroid skeleton leaving behind a cyclopentane fused to a macrocyclic ansa-ring system and opened up the way from steroids to novel macrolides (*Heterocycles*, 1989, **28**, 333). Using chiral cyclopentadienes as templates for Diels-Alder cycloadditions he established a novel procedure for the synthesis of enantiomerically pure building blocks (*Chem. Rev.*, 1993, **93**, 827). This method has been applied to the enantioselective total synthesis of didemnenones and clavularin A. His fundamental studies on the directed synthesis of unsymmetrical bissteroidal pyrazines of the cephalostatin group proved once again to be a pioneering achievement in the field of a novel class of natural products.

Ekkehard Winterfeldt has been co-editor and scientific advisor of a number of scientific journals, such as *Chemische Berichte*, *Chemical Communications*, *Journal für Praktische Chemie*, *Tetrahedron*, *Tetrahedron Letters* and *Organic Synthesis*. The important and fundamental contributions were recognized by the many honors awarded to Ekkehard Winterfeldt. For his contributions to the stereoselective synthesis of natural products he received the Emil-Fischer award of the German Chemical Society (GDCh) in 1990. In 1991 Ekkehard Winterfeldt received an honorary doctorate of the University

of Lüttich (Belgium) and in 1993 he was presented the Adolf-Windaus award of the University of Göttingen. The German Chemical Society acknowledged his pioneering work on the syntheses of diverse classes of natural products by the Richard-Kuhn award in 1995. Moreover, he was elected as president of the German Chemical Society (GDCh) for the years 1996 to 1997. He is also a member of the following academic societies: "Braunschweigische Wissenschaftliche Gesellschaft", "Göttinger Akademie der Wissenschaften" and "Deutsche Akademie der Naturforscher Leopoldina zu Halle".

Above all the important achievements of the internationally renowned scientist Ekkehard Winterfeldt, I would like to emphasize his qualities as an academic teacher. Ekkehard Winterfeldt has an extraordinary commitment to teaching, which became evident to everyone who had the opportunity to listen to his electrifying lectures (Figure 4). His lectures certainly laid the groundwork for an uninterrupted stream of students wishing to join his team over the 30 years he has been active at the University of Hannover. As a result of this productivity in his research group, more than 170 Ph.D. theses have been completed under his guidance, leading to many of the scientific achievements described above. Even now, seven years after his retirement, he enjoys regular visits to the Institute of Organic Chemistry at the University of Hannover, staying in touch with science and his colleagues and friends.

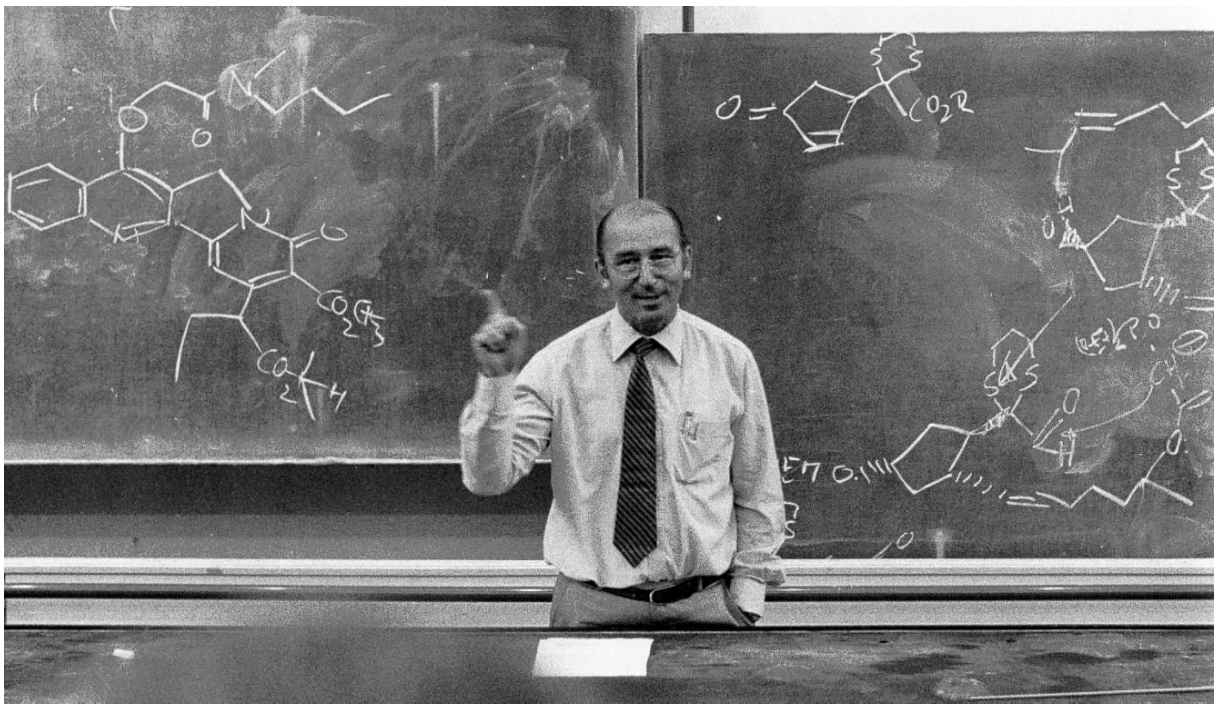

Figure 4. Ekkehard Winterfeldt giving a lecture to his students at the University of Hannover (courtesy of Dr. Karl-Heinz Marx, Dietzenbach, Germany).

Ekkehard Winterfeldt has conducted a highly productive research program over the decades and made highly significant contributions to modern synthetic organic chemistry in general and natural product chemistry in particular. He has influenced many young scientists in Germany and also abroad and it is a real pleasure to be able to honour him with this special issue of *Heterocycles*.

We all wish him many more years of enjoyment!

Hans-Joachim Knölker

Dresden, Germany

Hans-Joachim Knölker, born in 1958, graduated as Diplom-Chemiker from the University of Hannover, Germany, in 1983 and obtained his Ph.D. in 1985 at the same university in the group of Prof. E. Winterfeldt working on "Stereoselective Cyclopentanone Annelations". For his postdoctoral studies, he joined Prof. K. P. C. Vollhardt at the University of California at Berkeley in 1986. In 1987, he started at the University of Hannover the research project on "Transition Metal-mediated Synthesis of Heterocyclic Compounds" leading to his habilitation in 1990. In 1991, he became full professor of organic chemistry at the University of Karlsruhe, where he served as head of the chemistry department from 1995 to 1997. In 2001, he accepted an offer from the Technical University of Dresden and moved to his present position on the chair of organic chemistry in Dresden. In 2002, he joined the founding team of the biotech company JADO Technologies GmbH in Dresden. He is a fellow of the "Japan Society for the Promotion of Science" and of the "Royal Society of Chemistry". In March 2006, he was elected as an ordinary member of the "Saxon Academy of Sciences". His research interests include organometallic chemistry and natural product synthesis.