

## Prof. Dr. Albrecht Berkessel

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Albrecht Berkessel was born in 1955 and obtained his Diplom in 1982 at the University of Saarbrücken. For his PhD studies, he moved to the laboratory of Professor Waldemar Adam at the University of Würzburg. In 1985, he obtained his PhD for mechanistic studies on the photochemistry of divinyl ethers (*summa cum laude*). In 1985, he joined the research group of Professor Ronald Breslow at Columbia University, New York as a Lynen Fellow (AvH), to work on functionalized cyclodextrins as enzyme models and on the mechanism of biotin action. In 1986, he returned to Germany to start independent research on the mechanisms of nickel enzymes from methanogenic archaea. His habilitation at the University of Frankfurt/Main (associated to Professor Gerhard Quinkert) was completed in 1990. In 1992, he became Associate Professor at the University of Heidelberg. Since 1997, he had been a Full Professor of Organic Chemistry at the University of Cologne. In Fall 2021, he retired from this position. His current research interests center around biological/medicinal chemistry, as well as mechanistic and synthetic aspects of metal-based catalysis, organocatalysis, and enzymatic catalysis.

Albrecht Berkessel additionally served as temporary Associate Professor at the University of Wisconsin, Madison (USA). He held visiting professorships at the Research School of Chemistry of the Australian National University at Canberra, the National University of Singapore, Chuo University in Tokyo, and recently a Distinguished Visiting Professorship at Kyoto University, Japan. His awards include the Young Faculty Award of the Fonds der Chemischen Industrie, the Award in Chemistry of the Göttingen Academy of Sciences, and the Horst-Pracejus-Award of the German Chemical Society (GDCh, 2019). He has published > 250 research papers (h=62), and he is one of the two co-authors of the Wiley-VCH bestseller "Asymmetric Organocatalysis" (2005).

### Selected recent publications:

- (1) C. Wartmann, S. Nandi, J.-M. Neudörfl, A. Berkessel: Titanium Salalen Catalyzed Enantioselective Benzylic Hydroxylation; *Angew. Chem. Int. Ed.* **2023**, *62*, e202306584.
- (2) M. Paul, T. Thomulka, W. Harnying, J.-M. Neudörfl, C. R. Adams, J. Martens, G. Berden, J. Oomens, A. J. H. M. Meijer, A. Berkessel, M. Schäfer: Hydrogen Bonding Shuts Down Tunneling in Hydroxycarbenes: A Gas-Phase Study by Tandem-Mass Spectrometry, Infrared Ion Spectroscopy, and Theory; *J. Am. Chem. Soc.* **2023**, *145*, 12124–12135.
- (3) M.-C. Ahrweiler-Sawaryn, A. Biswas, C. Frias, J. Frias, N. L. Wilke, N. Wilke, A. Berkessel, A. Prokop: Novel Gold(I) Complexes Induce Apoptosis in Leukemia Cells *via* the ROS-Induced Mitochondrial Pathway with an Upregulation of *Harakiri* and Overcome Multi Drug Resistance in Leukemia and Lymphoma Cells and Sensitize Drug Resistant Tumor Cells to Apoptosis *in vitro*; *Biomedicine & Pharmacotherapy* **2023**, *262*, 114507.
- (4) F. Severin, G. M. Fusi, C. Wartmann, J.-M. Neudörfl, A. Berkessel: *syn*-Selective Epoxidation of Chiral Terminal Allylic Alcohols with a Titanium Salalen Catalyst and Hydrogen Peroxide; *Angew. Chem. Int. Ed.* **2022**, *61*, e202201790. *Very Important Paper*.
- (5) A. Wessels, M. Klußmann, M. Breugst, N. E. Schlörer, A. Berkessel: Formation of Breslow Intermediates from N-Heterocyclic Carbenes and Aldehydes Involves Autocatalysis by the Breslow Intermediate, and a Hemiacetal; *Angew. Chem. Int. Ed.* **2022**, *61*, e202117682. *Hot Paper*.
- (6) W. Harnying, P. Sudkaow, A. Biswas, A. Berkessel: N-Heterocyclic Carbene/Carboxylic Acid Co-Catalysis Enables Oxidative Esterification of Demanding Aldehydes/Enals, at Low Catalyst Loading; *Angew. Chem. Int. Ed.* **2021**, *60*, 19631-19636. *Hot Paper*.
- (7) H. Engler, M. Lansing, C. P. Gordon, J.-M. Neudörfl, M. Schäfer, N. E. Schlörer, C. Copéret, A. Berkessel: Olefin Epoxidation Catalyzed by Titanium–Salalen Complexes: Synergistic H<sub>2</sub>O<sub>2</sub> Activation by Dinuclear Ti Sites, Ligand H-Bonding, and  $\pi$ -Acidity; *ACS Catal.* **2021**, *11*, 3206-3217.
- (8) K. Burkert, H. Taheri, S. Hamad, M. Oliverio, G. Peinkofer, J.-W. Kornfeld, W. Harnying, K. Pfannkuche, J. Hescheler, A. Berkessel, T. Saric: Salicylic Diamines Selectively Eliminate Residual Undifferentiated Cells from Pluripotent Stem Cell-Derived Cardiomyocyte Preparations; *Scientific Reports* **2021**, *11*, 2391.
- (9) S. M. Hopff, Q. Wang, C. Frias, M. Ahrweiler, N. Wilke, N. Wilke, A. Berkessel, A. Prokop: A Metal-Free Salalen Ligand with Anti-Tumor and Synergistic Activity in Resistant Leukemia and Solid Tumor Cells *via* Mitochondrial Pathway; *J. Cancer Res. Clin. Oncol.* **2021**, *147*, 2591-2607.
- (10) C. P. Gordon, H. Engler, A. S. Tragl, M. Plodinec, T. Lunkenbein, A. Berkessel, J. H. Teles, A.-N. Parvulescu, C. Copéret: Efficient Epoxidation over Dinuclear Sites in Titanium Silicalite-1; *Nature* **2020**, *586*, 708-713.