

Bruno Dominelli

(Februar 2020)

November 2016 – Februar 2020

"Dinuclear Au(I) Complexes Bearing Bridge-Functionalized NHC Ligands as Anticancer Agents"



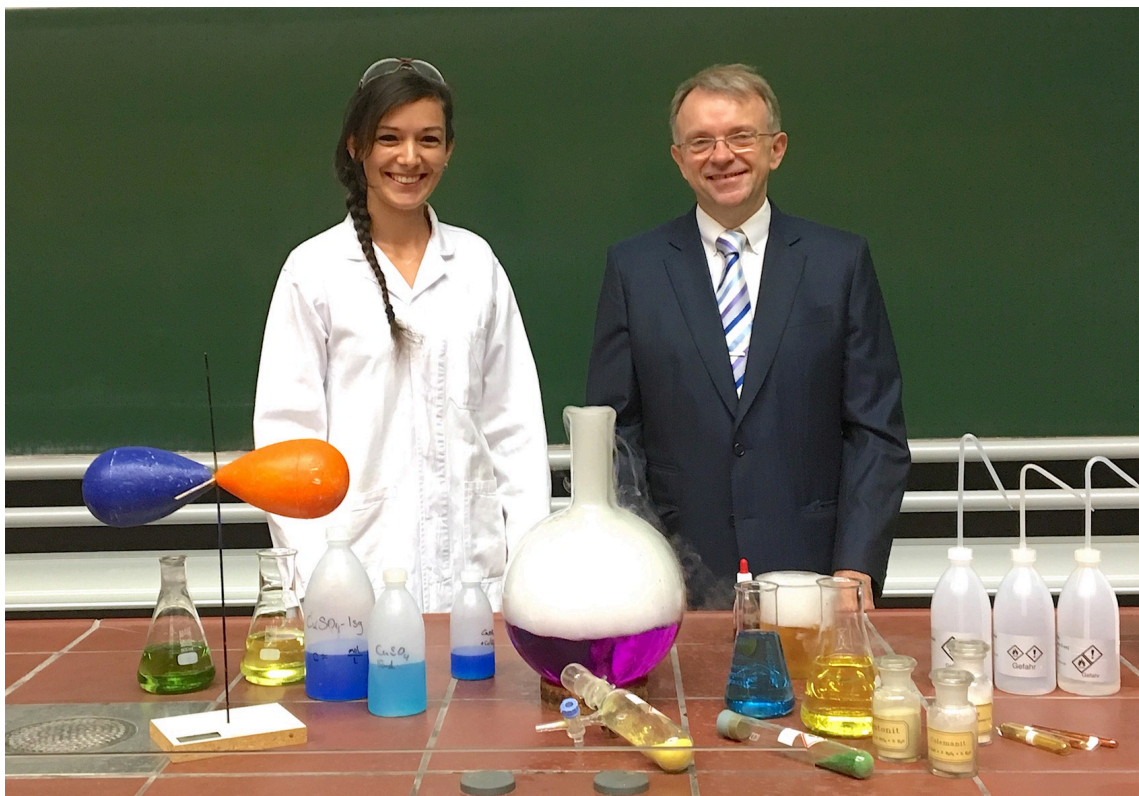
Abb. 61: Prof. Dr. Joao D. G. Correia, Prof. Dr. Angela Casini, Dr. Bruno Dominelli, Prof. Dr. Fritz E. Kühn (v. links)

Gemeinsame Publikationen:

- 1) C. H. G. Jakob, B. Dominelli, J. F. Schlagintweit, P. J. Fischer, F. Schuderer, R. M. Reich, F. Marques, J. D. G. Correia, F. E. Kühn*, *Chem. As. J.* **2020**, *24*, 4275-4279 (Improved Antiproliferative Activity and Fluorescence of a Dinuclear Gold(I) Bisimidazolylidene Complex via Anthracene-Modification).
- 2) C. H. G. Jakob, B. Dominelli, E. M. Hahn, T. O. Berghausen, T. Pinheiro, F. Marques, R. M. Reich, J. D. G. Correia, F. E. Kühn*, *Chem. As. J.*, **2020**, *15*, 2754-2762 (Antiproliferative Activity of Functionalized Histidine derived A(I) *bis*-NHC Complexes for Bioconjugation).
- 3) B. Dominelli, C. H. G. Jakob, J. Oberkofler, P. J. Fischer, E. M. Esslinger, R. M. Reich, F. Marques, T. Pinheiro, J. D. G. Correia, F. E. Kühn*, *Eur. J. Med. Chem.*, **2020**, *203*, 112576 (Mechanisms Underlying the Cytotoxic Activity of Syn/Anti-Isomers of Dinuclear Au(I) NHC Complexes).
- 4) C. H. G. Jakob, B. Dominelli, J. Rieb, C. Jandl, A. Pöthig, R. Reich, J. D. G. Correia, F. E. Kühn*, *Chem. Asian J.*, **2020**, *15*, 1848-1851 (Dinuclear Gold(I) Complexes Bearing *N, N'*-Allyl Bridged Bisimidazolylidene Ligands).
- 5) B. Dominelli, G. M. Roberts, C. Jandl, P. J. Fischer, R. M. Reich, A. Pöthig, J. D. G. Correia, F. E. Kühn, *Dalton Trans.*, **2019**, *48*, 14036-14043 (Dinuclear zwitterionic silver(i) and gold(i) complexes bearing 2,2-acetate-bridged bisimidazolylidene ligands).
- 6) Y. Li, B. Dominelli, R. M. Reich, B. Liu, F. E. Kühn*, *Cat. Comm.*, **2019**, *124*, 118-122 (Bridge-Functionalized Bisimidazolium Bromides as Catalysts for the Conversion of Epoxides to Cyclic Carbonates with CO₂).
- 7) B. Dominelli, A. C. Lindhorst, F. E. Kühn in *Alkane Functionalization (ISBN 9781119378808)*, John Wiley & Sons Ltd, Armando J. L. Pombeiro, M. Fátima C. Guedes da Silva, USA, **2019**, 105-112 (*C-H Bond Oxidation with Transition-Metal-Based Carbene Complexes (Chapter 5)*).
- 8) B. Dominelli, J. D. G. Correia*, F. E. Kühn*, *J. Organomet. Chem.*, **2018**, *866*, 153-164 (Medicinal Applications of Gold(I/III)-Based Complexes bearing *N*-Heterocyclic Carbene and Phosphine Ligands).
- 9) J. Rieb, B. Dominelli, D. Mayer, C. Jandl, J. Drechsel, W. Heydenreuter, S. A. Sieber, F. E. Kühn*, *Dalton Trans.*, **2017**, *46*, 2722-2735 (Influence of Wing-tip Substituents and Reaction Conditions on Structure, Properties and Cytotoxicity of Ag(I) and Au(I)-bis(NHC) Complexes).



„Selfie mit Professorin“ (Promtionskommission Dr. Bruno Dominelli (2. v. rechts))



Nadine Tappe (links) als Vorlesungsassistentin

Nadine Tappe

(Februar 2020)

Januar 2017 – Februar 2020

"Synthesis and applications of molecular catalysts for oxidations and oxygen transfer reactions"

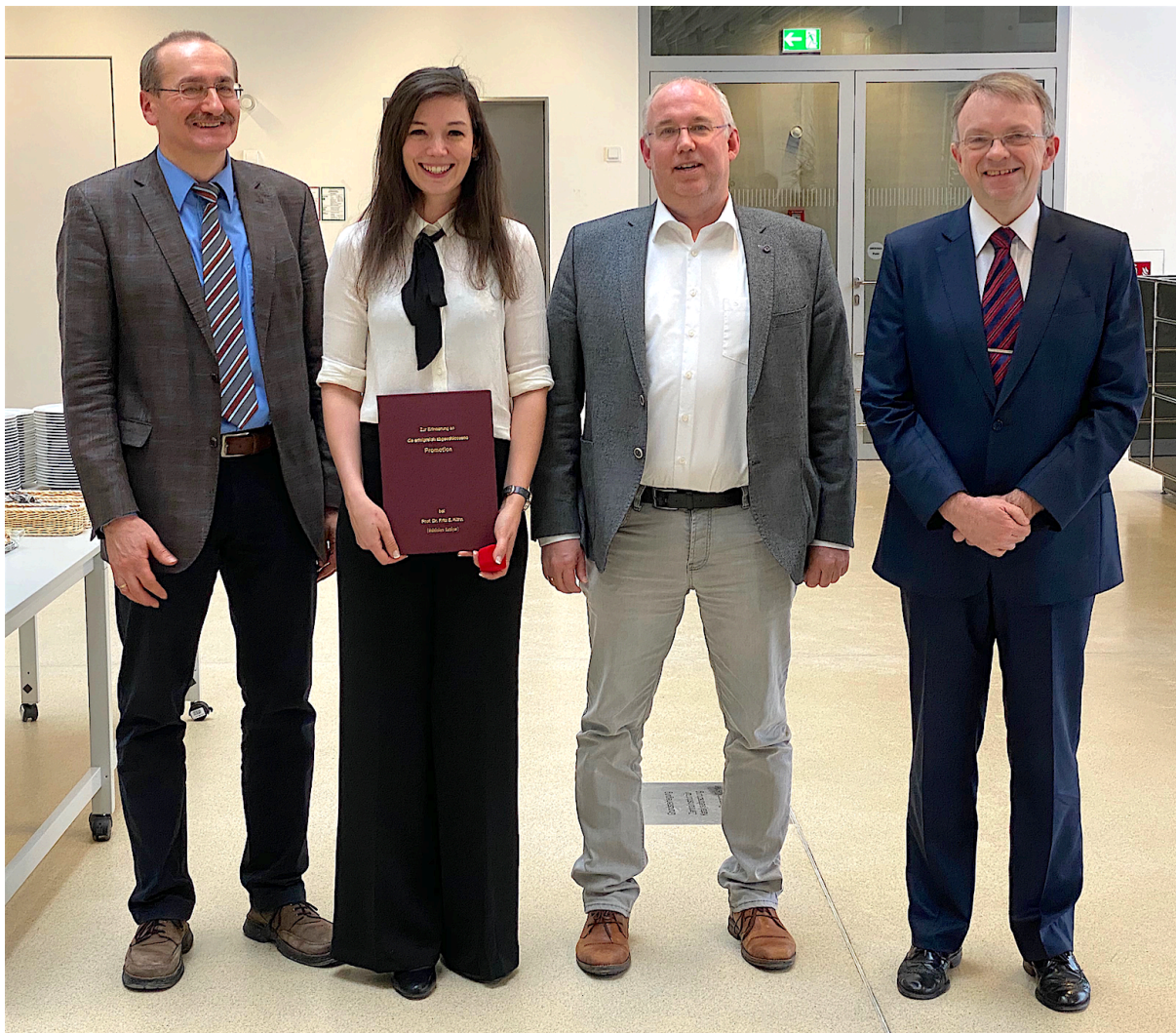


Abb. 62: Prof. Dr. Klaus Köhler, D. Nadine Tappe, Prof. Dr. Tom Nilges, Prof. Dr. Fritz E. Kühn (v. links)

Gemeinsame Publikationen:

- 1) N. Tappe und F. E. Kühn*, *Chem. in uns. Zeit*, **2020**, 54, 154-165 (Das Element Sauerstoff – Entstehung, Vorkommen, Entdeckung, Bedeutung).
- 2) N. Tappe, R. Reich, V. de Elia, F. E. Kühn*, *Dalton Trans.*, **2018**, 47, 13281-13313 (Current advances in the catalytic conversion of carbon dioxide by molecular catalysts: an update).

Carolyn Hintermeier

(April 2020)

Februar 2017 – April 2020

"Biomimetic Iron-NHC-Complexes – Synthesis and characterisation"



Abb 63: Dr. Carolyn Hintermeier, Prof. Dr. Fritz E. Kühn (v. links)

Gemeinsame Publikationen:

- 1) T. P. Schlachta, M. R. Anneser, J. F. Schlagintweit, C. H. G. Jakob, C. Hintermeier, A. D. Böth, S. Haslinger, R. M. Reich, F. E. Kühn* *Chem. Commun.*, **2021**, 57, 6644-6647 (Mimicking reactive high-valent diiron- μ_2 -oxo intermediates of nonheme enzymes by an iron teracarbene complex).
- 2) J. F. Schlagintweit, C. Hintermeier, M. Anneser, E. M. H. J. Esslinger, S- Haslinger, F. E. Kühn*, *Chem. Asian J.* **2020**, 15, 1896-1902 (Electronic Fine tuning of a Bio-inspired Iron(II) tetra-NHC Complex by trans Axial Isocyanide Substitution).

Christiane Egger

(September 2020)

Juli 2016 – September 2020

"Time and Temperature dependent Reactivity Studies of a Dipyridine Ethynyl Ligand with Zinc(II) and Synthesis and Characterization of new Precursors for the Deposition of Refractory Metals from Ionic Liquids"



Abb 64: Prof. Dr. Klaus Köhler, Prof. Dr. Fritz E. Kühn, Dr. Christiane M. Egger, Prof. Dr. Tom Nilges (v. links)

Gemeinsame Publikation:

- 1) C. M. Egger, C. H. G. Jakob, F. Kaiser, O. Rindle, P. J. Altmann, R. M. Reich, Fritz E. Kühn*, *Eur. J. Inorg. Chem.*, **2019**, 48, 5059-5065 (Reactivity studies of a dipyridine ethynyl ligand with Zn(II)).

Daniela Hey

(September 2020)

Dezember 2017 – September 2020

"Ruthenium Diphosphine Complexes bearing Carboxylate Ligands as Active Catalysts for Ketone Transfer Hydrogenation"



Abb. 65: Prof. Dr. Fritz E. Kühn, Dr. Daniela A. Hey (v. links)

Gemeinsame Publikationen:

- 1) D. A. Hey, M. J. Sauer, P. J. Fischer, E. M. H. J. Esslinger, F. E. Kühn*, W. Baratta*, *ChemCatChem*, **2020**, 12, 3537-3544 (Acetate Acetylacetonate Ampy Ruthenium(II) Complexes as Efficient Catalysts for Ketone Transfer Hydrogenation).
- 2) D. A. Hey, P. J. Fischer, W. Baratta*, F. E. Kühn*, *Dalton Trans.*, **2019**, 48, 4625-4635 (Ru(O₂CCF₃)₂ (PPh₃)₂ and ruthenium phosphine complexes bearing fluoro acetate ligands: synthesis, characterization and catalytic activity).
- 3) D. A. Hey, R. M. Reich, W. Baratta*, F. E. Kühn*, *Coord. Chem. Rev.*, **2018**, 374, 114-132 (Current advances on ruthenium(II) *N*-heterocyclic carbenes in hydrogenation reactions).



Gespräche zur Patentübernahme „Reisschalenwachs“ zwischen TUM ForTe, BayPat und Clariant

Florian Dyckhoff

(September 2020)

Oktober 2016 – September 2020

"Tuning Activity and Stability: Non-Heme Iron *N*-heterocyclic Carbene Complexes in the Catalytic Epoxidation of Olefins"



Abb. 66: Prof. Dr. Klaus Köhler, Dr. Florian Dyckhoff, Prof. Dr. Fritz E. Kühn, Prof. Dr. Tom Nilges (v. links).

Gemeinsame Publikationen:

- 1) F. Dyckhoff, J. F. Schlagintweit, M. A. Bernd, C. H. G. Jakob, T. P. Schlachta, B. J. Hofmann, R. M. Reich, F. E. Kühn*, *Cat. Sci. Technol.*, **2021**, *11*, 795-799 (Degradation pathways of a highly active iron(III) tetra-NHC epoxidation catalyst).
- 2) M. A. Bernd, F. Dyckhoff, B. J. Hofmann, A. D. Böth, J. F. Schlagintweit, J. Oberkofler, R. M. Reich, F. E. Kühn*, *J. Catal.*, **2020**, *391*, 548-561 (Tuning the electronic properties of tetradentate iron-NHC complexes: Towards stable and selective epoxidation catalysts).
- 3) F. Dyckhoff, J. F. Schlagintweit, R. M. Reich, F. E. Kühn*, *Cat. Sci. Technol.*, **2020**, *10*, 3532-3536 (Pushing the Limits of Activity and Stability: The Effects of Lewis Acids on non-heme Iron-NHC Epoxidation Catalysis).
- 4) J. F. Schlagintweit, F. Dyckhoff, L. Nguyen, C. H. G. Jakob, R. M. Reich, F. E. Kühn*, *J. Catal.*, **2020**, *383*, 144-152 (Mixed tetradentate NHC/1,2,3-triazole iron complexes bearing cis labile coordination sites as highly active catalysts in Lewis and Brønsted acid mediated olefin epoxidation).
- 5) J. F. Schlagintweit, L. Nguyen, F. Dyckhoff, F. Kaiser, R. M. Reich, F. E. Kühn*, *Dalton Trans.*, **2019**, *48*, 14820-14828 (Exploring Different Coordination Modes of the First Tetradentate NHC/1,2,3-Triazole Hybrid Ligand for Group 10 Complexes).
- 6) F. Dyckhoff, F. Kaiser, S. Hölzl, F. E. Kühn*, *Z. Anorg. Allg. Chem.*, **2019**, *645*, 207-211 (Synthesis and Characterization of new *N*-heterocyclic Silylazides).
- 7) F. Dyckhoff, S. Li, R. M. Reich, B. J. Hofmann, E. Herdtweck, F. E. Kühn*, *Dalton Trans.*, **2018**, *47*, 9755-9764 (Synthesis, characterization and application of organorhenium(VII) trioxides in metathesis reactions and epoxidation catalysis).



Konferenzteilnahme in USA mit Prof. Dr. Debbie Crans (2. v. links)

Jens Oberkofler

(Oktober 2020)

August 2017 – Oktober 2020

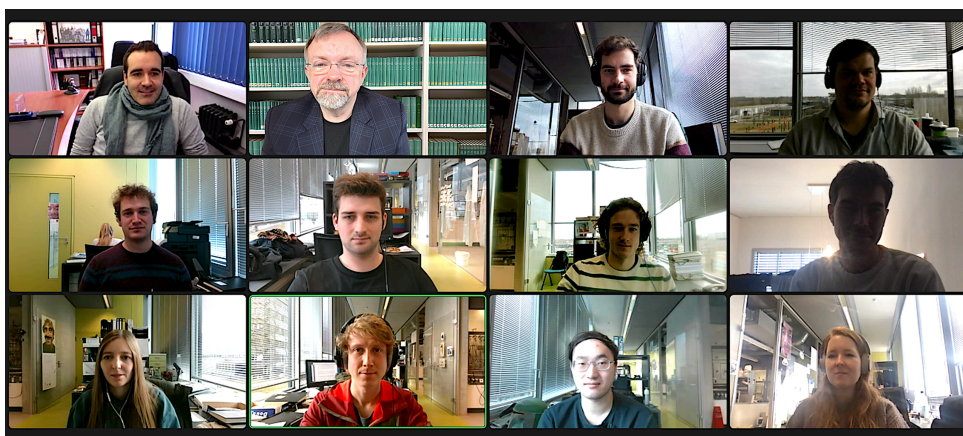
"Beyond Cisplatin: *N*-Heterocyclic Carbene Gold(I) Complexes as Anticancer Agents and their Use in Drug Delivery Systems"



Abb. 67: Prof. Dr. Wolfgang Eisenreich, Prof. Dr. Fritz E. Kühn, Dr. Jens Oberkofler, Prof. Dr. Tom Nilges (v. links)

Gemeinsame Publikationen:

- 1) M. A. Bernd, E. B. Bauer, J. Oberkofler, A. Bauer, R. M. Reich, F. E. Kühn*, *Dalton Trans.* **2020**, 49, 14106-14114 (Macrocyclic NHC complexes of group 10 elements with enlarged aromaticity for biological studies).
- 2) M. A. Bernd, F. Dyckhoff, B. J. Hofmann, A. D. Böth, J. F. Schlagintweit, J. Oberkofler, R. M. Reich, F. E. Kühn*, *J. Catal.*, **2020**, 391, 548-561 (Tuning the electronic properties of tetradentate iron-NHC complexes: Towards stable and selective epoxidation catalysts).
- 3) B. Dominelli, C. H. G. Jakob, J. Oberkofler, P. J. Fischer, E. M. Esslinger, R. M. Reich, F. Marques, T. Pinheiro, J. D. G. Correia, F. E. Kühn*, *Eur. J. Med. Chem.*, **2020**, 203, 112576 (Mechanisms Underlying the Cytotoxic Activity of Syn/Anti-Isomers of Dinuclear Au(I) NHC Complexes).
- 4) D. Xu, H. Li, G. Pan, P. Huang, J. Oberkofler, R. M. Reich, F. E. Kühn*, H. Guo*, *Org. Letters*, **2020**, 22, 4372-4377 (Visible light-induced metal-free olefin-olefin coupling for building seven- and eight-membered rings).
- 5) J. Oberkofler, B. Aikman, R. Bonsignore, A. Pöthig, J. Platts, A. Casini*, F. E. Kühn*, *Eur. J. Inorg. Chem.*, **2020**, 1040-1051 (Exploring the Reactivity and Biological Effects of Heteroleptic N-Heterocyclic Carbene-Au(I)-Alkynyl Complexes).
- 6) E. B. Bauer, M. Bernd, M. Schütz, J. Oberkofler, A. Pöthig, R. M. Reich, F. E. Kühn, *Dalton Trans.*, **2019**, 48, 16615-16625 (Synthesis, Characterization and Biological Studies of Multidentate Gold(I) and Gold(III) NHC Complexes).



Gruppenseminar während der Corona-Pandemie

Marco Bernd

(Januar 2021)

November 2017 – Januar 2021

"Macrocyclic Tetra-dentate NHC Complexes for Catalysis and Medicinal Chemistry"



Abb. 68: Dr. Marco A. Bernd, Prof. Dr. Fritz E. Kühn (v. rechts)

Gemeinsame Publikationen:

- 1) F. Dyckhoff, J. F. Schlagintweit, M. A. Bernd, C. H. G. Jakob, T. P. Schlachta, B. J. Hofmann, R. M. Reich, F. E. Kühn*, *Cat. Sci. Technol.*, **2021**, 11, 795-799 (Degradation pathways of a highly active iron(III) tetra-NHC epoxidation catalyst).
- 2) M. A. Bernd, E. B. Bauer, J. Oberkofler, A. Bauer, R. M. Reich, F. E. Kühn*, *Dalton Trans.* **2020**, 49, 14106-14114 (Macrocyclic NHC complexes of group 10 elements with enlarged aromaticity for biological studies).
- 3) M. A. Bernd, F. Dyckhoff, B. J. Hofmann, A. D. Böth, J. F. Schlagintweit, J. Oberkofler, R. M. Reich, F. E. Kühn*, *J. Catal.*, **2020**, 391, 548-561 (Tuning the electronic properties of tetradentate iron-NHC complexes: Towards stable and selective epoxidation catalysts).
- 4) E. B. Bauer, M. Bernd, M. Schütz, J. Oberkofler, A. Pöthig, R. M. Reich, F. E. Kühn, *Dalton Trans.*, **2019**, 48, 16615-16625 (Synthesis, Characterization and Biological Studies of Multidentate Gold(I) and Gold(III) NHC Complexes).



Chemieprofessoren an der TUM 2019

Benjamin J. Hofmann

(März 2021)

Juli 2016 – März 2021

"High Valent Rhenium Compounds in Catalysis: Synthesis, Reactivity and Decomposition Pathways"



Abb. 69: Dr. Benjamin J. Hofmann, Prof. Dr. Fritz E. Kühn (v. rechts).

Gemeinsame Publikationen:

- 1) F. Dyckhoff, J. F. Schlagintweit, M. A. Bernd, C. H. G. Jakob, T. P. Schlachta, B. J. Hofmann, R. M. Reich, F. E. Kühn*, *Cat. Sci. Technol.*, **2021**, 11, 795-799 (Degradation pathways of a highly active iron(III) tetra-NHC epoxidation catalyst).
- 2) J. F. Schlagintweit, P. J. Altmann, B. J. Hofmann, A. D. Böth, C. Jandl, C. Kaußler, L. Nguyen, R. M. Reich, A. Pöthig, F. E. Kühn*, *Chem. Eur. J.*, **2021**, 18, 1311-1315 (Activation of Molecular Oxygen by a Cobalt(II) tetra-NHC Complex).

- 3) M. A. Bernd, F. Dyckhoff, B. J. Hofmann, A. D. Böth, J. F. Schlagintweit, J. Oberkofler, R. M. Reich, F. E. Kühn*, *J. Catal.*, **2020**, 391, 548-561 (Tuning the electronic properties of tetradentate iron-NHC complexes: Towards stable and selective epoxidation catalysts).
- 4) L. Pardatscher, B. J. Hofmann, P. J. Fischer, S. M. Hölzl, R. M. Reich, F. E. Kühn*, W. Baratta*, *ACS Catalysis*, **2019**, 9, 11302-11306 (Highly Efficient Abnormal NHC Ruthenium Catalyst for Oppenauer-Type Oxidation and Transfer Hydrogenation Reactions).
- 5) B. J. Hofmann, R. G. Harms, S. P. Schwaminger, R. M. Reich, F. E. Kühn*, *J. Catal.*, **2019**, 373, 190-200 (Reactivity of Re₂O₇ in Aromatic Solvents – Cleavage of a β -O-4 Lignin Model Substrate by Lewis-acidic Rhenium Oxide Nanoparticles).
- 6) B. J. Hofmann, S. Huber, R. M. Reich, M. Drees, F. E. Kühn*, *J. Organomet. Chem.*, **2019**, 885, 32-38 (Ethyltrioxorhenium – Catalytic Application and Decomposition Pathway).
- 7) Z. S. Ghamavi, M. R. Anneser, F. Kaiser, P. J. Altmann, B. J. Hofmann, J. F. Schlagintweit, G. Grivani, F. E. Kühn*, *Chem. Sci.*, **2018**, 9, 8307-8314. (A bench stable formal Cu(III)N-heterocyclic carbene accessible from simple copper(II)acetate).
- 8) F. Dyckhoff, S. Li, R. M. Reich, B. J. Hofmann, E. Herdtweck, F. E. Kühn*, *Dalton Trans.*, **2018**, 47, 9755-9764 (Synthesis, characterization and application of organorhenium(VII) trioxides in metathesis reactions and epoxidation catalysis).
- 9) J. W. Kück, M. R. Anneser, B. J. Hofmann, A. Pöthig, M. Cokoja, F. E. Kühn*, *ChemSusChem*, **2015**, 8, 4056-4063 (Fighting Fenton Chemistry: A Highly Active Iron(III)-Tetracarbene Complex in Epoxidation Catalysis).
- 10) S. A. Reindl, A. Pöthig*, B. J. Hofmann, W. A. Herrmann*, F. E. Kühn*, *J. Organomet. Chem.*, **2015**, 775, 130-136 (Dinuclear Palladium Complexes of Pyrazolato-Bridged Imidazolium- and NHC-Ligands: Synthesis and Characterization).
- 11) R. Zhong, A. Pöthig*, S. Haslinger, B. J. Hofmann, G. Raudaschl-Sieber, E. Herdtweck, W. A. Herrmann, F. E. Kühn*, *ChemPlusChem*, **2014**, 79, 1294-1303 (Toward Tuneable Immobilized Molecular Catalysts: Functionalizing the Methylene-Bridge of Bis(NHC)-Ligands).

Christian H. G. Jakob

(April 2021)

Dezember 2017 – April 2021

"Synthesis and Characterization of Au(I) bis-NHC Complexes as Potential Anticancer Drugs"

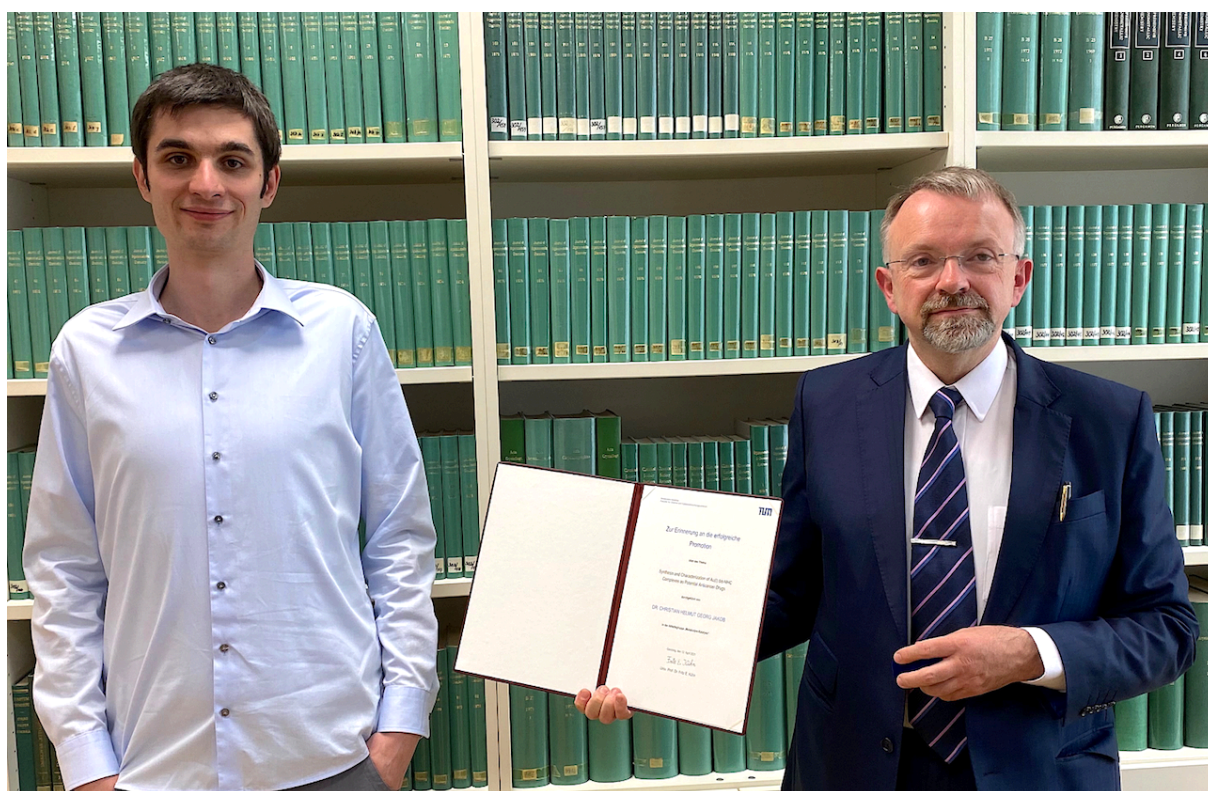


Abb. 70: Dr. Christian H. G. Jakob, Prof. Dr. Fritz E. Kühn (v. links)

Gemeinsame Publikationen:

- 1) J. F. Schlagintweit, C. H. G. Jakob, N. L. Wilke, M. Ahrweiler, C. Frias, J. Frias, M. König, E. M. H. J. Esslinger, F. Marques, J. F. Machado, R. M. Reich, T. S. Morais, J. D. G. Correia, A. Prolop, F. E. Kühn, *J. Med. Chem.*, **2021**, 64, 15747 - 15757 (Gold(I)bis(1,2,3-Triazol-5-yliden)Complexes as Promising Selective Anticancer Compounds).

- 2) T. P. Schlachta, M. R. Anneser, J. F. Schlagintweit, C. H. G. Jakob, C. Hintermeier, A. D. Böth, S. Haslinger, R. M. Reich, F. E. Kühn* *Chem. Commun.*, **2021**, 57, 6644-6647 (Mimicking reactive high-valent diiron- μ_2 -oxo intermediates of nonheme enzymes by an iron teracarbene complex).
- 3) M. A. Bernd, F. Dyckhoff, B. J. Hofmann, A. D. Böth, J. F. Schlagintweit, J. Oberkofler, R. M. Reich, F. E. Kühn*, *J. Catal.*, **2020**, 391, 548-561 (Tuning the electronic properties of tetradentate iron-NHC complexes: Towards stable and selective epoxidation catalysts).
- 4) F. Dyckhoff, J. F. Schlagintweit, M. A. Bernd, C. H. G. Jakob, T. P. Schlachta, B. J. Hofmann, R. M. Reich, F. E. Kühn*, *Cat. Sci. Technol.*, **2021**, 11, 795-799 (Degradation pathways of a highly active iron(III) tetra-NHC epoxidation catalyst).
- 5) J. F. Schlagintweit, C. H. G. Jakob, K. Meighen-Berger, T. F. Gronauer, A. Weigert Muñoz, V. Weiß, M. J. Feige, S. A. Sieber, J. D. G. Correia, F. E. Kühn*, *Dalton Trans.* **2021**, 50, 2158-2166 (Fluorescent palladium(II) and platinum(II) NHC/1,2,3-triazole complexes: antiproliferative activity and selectivity against cancer cells).
- 6) C. H. G. Jakob, A. Weigert Muñoz, J. F. Schlagintweit, V. Weiß, R. M. Reich, S. A. Sieber, J. D. G. Correia, F. E. Kühn*, *J. Organomet. Chem.*, **2021**, 932, 121643 (Anticancer and antibacterial properties of trinuclear Cu(I), Ag(I) and Au(I) macrocyclic NHC/urea complexes).
- 7) C. H. G. Jakob, B. Dominelli, J. F. Schlagintweit, P. J. Fischer, F. Schuderer, R. M. Reich, F. Marques, J. D. G. Correia, F. E. Kühn*, *Chem. As. J.* **2020**, 24, 4275-4279 (Improved Antiproliferative Activity and Fluorescence of a Dinuclear Gold(I) Bisimidazolylidene Complex via Anthracene-Modification).
- 8) C. H. G. Jakob, B. Dominelli, E. M. Hahn, T. O. Berghausen, T. Pinheiro, F. Marques, R. M. Reich, J. D. G. Correia, F. E. Kühn*, *Chem. As. J.*, **2020**, 15, 2754-2762 (Antiproliferative Activity of Functionalized Histidine derived A(I) bis-NHC Complexes for Bioconjugation).
- 9) B. Dominelli, C. H. G. Jakob, J. Oberkofler, P. J. Fischer, E. M. Esslinger, R. M. Reich, F. Marques, T. Pinheiro, J. D. G. Correia, F. E. Kühn*, *Eur. J. Med. Chem.*, **2020**, 203, 112576 (Mechanisms Underlying the Cytotoxic Activity of Syn/Anti-Isomers of Dinuclear Au(I) NHC Complexes).
- 10) C. H. G. Jakob, B. Dominelli, J. Rieb, C. Jandl, A. Pöthig, R. Reich, J. D. G. Correia, F. E. Kühn*, *Chem. Asian J.*, **2020**, 15, 1848-1851 (Dinuclear Gold(I) Complexes Bearing *N, N'*-Allyl Bridged Bisimidazolylidene Ligands).
- 11) J. F. Schlagintweit, F. Dyckhoff, L. Nguyen, C. H. G. Jakob, R. M. Reich, F. E. Kühn*, *J. Catal.*, **2020**, 383, 144-152 (Mixed tetradentate NHC/1,2,3-triazole iron complexes bearing cis labile coordination sites as highly active catalysts in Lewis and Brønsted acid mediated olefin epoxidation).

- 12) C. M. Egger, C. H. G. Jakob, F. Kaiser, O. Rindle, P. J. Altmann, R. M. Reich, Fritz E. Kühn*, *Eur. J. Inorg. Chem.*, **2019**, 48, 5059-5065 (Reactivity studies of a dipyridine ethynyl ligand with Zn(II)).



Wackerprojekt mit Benjamin Hofmann (3. v. rechts)

Han Li

(April 2021)

Oktober 2015 – April 2021

"Heteroleptic Fe(II)-6-NHC complex with 130 ps Metal-to-Ligand Charge-Transfer state lifetime & Mechanism study of new photocatalyzed method to build medium-sized ring compounds"



Abb. 71: Prof. Dr. Tom Nilges, Prof. Dr. Fritz E. Kühn, Prof. Dr. Hao Guo, Dr. Han Li (v. links und oben)

Gemeinsame Publikation:

- 1) D. Xu, H. Li, G. Pan, P. Huang, J. Oberkofler, R. M. Reich, F. E. Kühn*, H. Guo*, *Org. Letters*, **2020**, 22, 4372-4377 (Visible light-induced metal-free olefin-olefin coupling for building seven- and eight-membered rings).

Jonas F. Schlagintweit

(Mai 2021)

Februar 2018 – Mai 2021

"Transition Metal NHC Complexes in Oxidation Catalysis and Medicinal Chemistry"



Abb 72: Dr. Jens Schlagintweit, Prof. Dr. Fritz E. Kühn (v. rechts)

Gemeinsame Publikationen:

- 1) G. G. Zámbo, J. F. Schlagintweit, R. M. Reich, F. E. Kühn, *Cat. Sci. Technol.* **2022**, 12, 4940-4961 (Organometallic 3d transition metal NHC complexes in oxidation catalysis).
- 2) E. M. H. J. Esslinger, J. F. Schlagintweit, G. G. Zámbo, A. M. Imhof, R. M. Reich, F. E. Kühn, *Asian J. Org. Chem.*, **2021** 10, 2654-2662 (Effects of *trans* Axial Isocyanide Ligands on Iron(II) tetra-NHC Complexes and their Reactivity in Olefin Epoxidation).
- 3) J. F. Schlagintweit, C. H. G. Jakob, N. L. Wilke, M. Ahrweiler, C. Frias, J. Frias, M. König, E. M. H. J. Esslinger, F. Marques, J. F. Machado, R. M. Reich, T. S. Morais, J. D. G. Correia, A. Prokop, F. E. Kühn, *J. Med. Chem.*, **2021**, 64, 15747 - 15757 (Gold(I)bis(1,2,3-Triazol-5-yliden) Complexes as Promising Selective Anticancer Compounds).
- 4) T. P. Schlachta, M. R. Anneser, J. F. Schlagintweit, C. H. G. Jakob, C. Hintermeier, A. D. Böth, S. Haslinger, R. M. Reich, F. E. Kühn* *Chem. Commun.*, **2021**, 57, 6644-6647 (Mimicking reactive high-valent diiron- μ_2 -oxo intermediates of nonheme enzymes by an iron teracarbene complex).
- 5) F. Dyckhoff, J. F. Schlagintweit, M. A. Bernd, C. H. G. Jakob, T. P. Schlachta, B. J. Hofmann, R. M. Reich, F. E. Kühn*, *Cat. Sci. Technol.*, **2021**, 11, 795-799 (Degradation pathways of a highly active iron(III) tetra-NHC epoxidation catalyst).
- 6) J. F. Schlagintweit, C. H. G. Jakob, K. Meighen-Berger, T. F. Gronauer, A. Weigert Muñoz, V. Weiß, M. J. Feige, S. A. Sieber, J. D. G. Correia, F. E. Kühn*, *Dalton Trans.* **2021**, 50, 2158-2166 (Fluorescent palladium(II) and platinum(II) NHC/1,2,3-triazole complexes: antiproliferative activity and selectivity against cancer cells).
- 7) T. P. Schlachta, J. F. Schlagintweit, M. R. Anneser, M. E. H. J. Esslinger, M. Muhr, S. Haslinger, F. E. Kühn*, *Inorg. Chim. Acta*, **2021** 518, 120228 (Modification of Bio-Inspired tetra-NHC Iron Complexes with Axial Nitrile Ligands).
- 8) C. H. G. Jakob, A. Weigert Muñoz, J. F. Schlagintweit, V. Weiß, R. M. Reich, S. A. Sieber, J. D. G. Correia, F. E. Kühn*, *J. Organomet. Chem.*, **2021**, 932, 121643 (Anticancer and antibacterial properties of trinuclear Cu(I), Ag(I) and Au(I) macrocyclic NHC/urea complexes).
- 9) J. F. Schlagintweit, P. J. Altmann, B. J. Hofmann, A. D. Böth, C. Jandl, C. Kaußler, L. Nguyen, R. M. Reich, A. Pöthig, F. E. Kühn*, *Chem. Eur. J.*, **2021**, 18, 1311-1315 (Activation of Molecular Oxygen by a Cobalt(II) tetra-NHC Complex).

- 10) M. A. Bernd, F. Dyckhoff, B. J. Hofmann, A. D. Böth, J. F. Schlagintweit, J. Oberkofler, R. M. Reich, F. E. Kühn*, *J. Catal.*, **2020**, 391, 548-561 (Tuning the electronic properties of tetradentate iron-NHC complexes: Towards stable and selective epoxidation catalysts).
- 11) C. H. G. Jakob, B. Dominelli, J. F. Schlagintweit, P. J. Fischer, F. Schuderer, R. M. Reich, F. Marques, J. D. G. Correia, F. E. Kühn*, *Chem. As. J.* **2020**, 24, 4275-4279 (Improved Antiproliferative Activity and Fluorescence of a Dinuclear Gold(I) Bisimidazolylidene Complex via Anthracene-Modification).
- 12) M. A. Bernd, F. Dyckhoff, B. J. Hofmann, A. D. Böth, J. F. Schlagintweit, J. Oberkofler, R. M. Reich, F. E. Kühn*, *J. Catal.*, **2020**, 391, 548-561 (Tuning the electronic properties of tetradentate iron-NHC complexes: Towards stable and selective epoxidation catalysts).
- 13) F. Dyckhoff, J. F. Schlagintweit, R. M. Reich, F. E. Kühn*, *Cat. Sci. Technol.*, **2020**, 10, 3532-3536 (Pushing the Limits of Activity and Stability: The Effects of Lewis Acids on non-heme Iron-NHC Epoxidation Catalysis).
- 14) J. F. Schlagintweit, C. Hintermeier, M. Anneser, E. M. H. J. Esslinger, S- Haslinger, F. E. Kühn*, *Chem. Asian J.* **2020**, 15, 1896-1902 (Electronic Fine tuning of a Bio-inspired Iron(II) tetra-NHC Complex by trans Axial Isocyanide Substitution).
- 15) J. F. Schlagintweit, F. Dyckhoff, L. Nguyen, C. H. G. Jakob, R. M. Reich, F. E. Kühn*, *J. Catal.*, **2020**, 383, 144-152 (Mixed tetradentate NHC/1,2,3-triazole iron complexes bearing cis labile coordination sites as highly active catalysts in Lewis and Brönsted acid mediated olefin epoxidation).
- 16) J. F. Schlagintweit, L. Nguyen, F. Dyckhoff, F. Kaiser, R. M. Reich, F. E. Kühn*, *Dalton Trans.*, **2019**, 48, 14820-14828 (Exploring Different Coordination Modes of the First Tetradentate NHC/1,2,3-Triazole Hybrid Ligand for Group 10 Complexes).
- 17) Z. S. Ghamavi, M. R. Anneser, F. Kaiser, P. J. Altmann, B. J. Hofmann, J. F. Schlagintweit, G. Grivani, F. E. Kühn*, *Chem. Sci.*, **2018**, 9, 8307-8314. (A bench stable formal Cu(III) *N*-heterocyclic carbene accessible from simple copper(II)acetate).

Eva M. H. J. Esslinger

(März 2022)

September 2018 – März 2022

"Activation and application of oxygenated species"



Abb 72: Prof. Dr. Klaus Köhler, Dr. Eva M. H. J. Essliner, Prof. Dr. Fritz E. Kühn, Prof. Dr. Lukas Hintermann (v. links).

Gemeinsame Publikationen:

- 1) E. M. H. J. Esslinger, J. F. Schlagintweit, G. G. Zámbo, A. M. Imhof, R. M. Reich, F. E. Kühn, *Asian J. Org. Chem.*, **2021** 10, 2654-2662 (Effects of *trans* Axial Isocyanide Ligands on Iron(II) tetra-NHC Complexes and their Reactivity in Olefin Epoxidation).
- 2) J. F. Schlagintweit, C. H. G. Jakob, N. L. Wilke, M. Ahrweiler, C. Frias, J. Frias, M. König, E. M. H. J. Esslinger, F. Marques, J. F. Machado, R. M. Reich, T. S. Morais, J. D. G. Correia, A. Prokop*, F. E. Kühn*, *J. Med. Chem.*, **2021**, 64, 15747 - 15757 (Gold(I)bis(1,2,3-Triazol-5-yliden) Complexes as Promising Selective Anticancer Compounds).
- 3) T. P. Schlachta, J. F. Schlagintweit, M. R. Anneser, M. E. H. J. Esslinger, M. Muhr, S. Haslinger, F. E. Kühn*, *Inorg. Chim. Acta*, **2021** 518, 120228 (Modification of Bio-Inspired tetra-NHC Iron Complexes with Axial Nitrile Ligands).
- 4) B. Dominelli, C. H. G. Jakob, J. Oberkofler, P. J. Fischer, E. M. Esslinger, R. M. Reich, F. Marques, T. Pinheiro, J. D. G. Correia, F. E. Kühn*; *Eur. J. Med. Chem.*, **2020**, 203, 112576 (Mechanisms Underlying the Cytotoxic Activity of Syn/Anti-Isomers of Dinuclear Au(I) NHC Complexes).
- 5) D. A. Hey, M. J. Sauer, P. J. Fischer, E. M. H. J. Esslinger, F. E. Kühn*, W. Baratta*, *ChemCatChem*, **2020**, 12, 3537-3544 (Acetate Acetylacetonate Ampy Ruthenium(II) Complexes as Efficient Catalysts for Ketone Transfer Hydrogenation).
- 6) J. F. Schlagintweit, C. Hintermeier, M. Anneser, E. M. H. J. Esslinger, S. Haslinger, F. E. Kühn*, *Chem. Asian J.* **2020**, 15, 1896-1902 (Electronic Fine tuning of a Bio-inspired Iron(II) tetra-NHC Complex by *trans* Axial Isocyanide Substitution).



Alexander D. Böth

(November 2022)

Juli 2019 – November 2022

"Modification of bis-Abnormal *N*-Heterocyclic Carbene Phosphino Ruthenium Complexes and Influences on Transfer Hydrogenation and Oppenauer-type Oxidation Reactions"



Abb. 74: Dr. Alexander D. Böth, Prof. Dr. Fritz E. Kühn (v. rechts)

Gemeinsame Publikationen:

- 1) M. Kaikhosravi, A. D. Böth, M. J. Sauer, R. M. Reich, Fritz E. Kühn* *J. Organomet. Chem.*, **2022**, 979, 122498 (Synthesis and Characterisation of a Heterobimetallic *N*-heterocyclic Carbene Rhodium Ruthenium Complex as Catalyst for Transfer Hydrogenation).
- 2) A. D. Böth, M. J. Sauer, W. Baratta*, F. E. Kühn*, *Cat. Sci. Technol.*, **2022**, 12, 5597-5603 (Abnormal NHC Ruthenium Catalysts: Mechanistic Investigations of their Preparation and Steric Influence on Catalysis Performance).
- 3) A. D. Böth, M. J. Sauer, R. M. Reich, F. E. Kühn, Reference Collection in Chemistry and Chemical Engineering, Comprehensive Organometallic Chemistry IV (Eds: K. Meyer, D. O'Hare, G. Parkin), Elsevier, **2022**, Vo. 7, 444-527 (Ruthenium and Osmium Complexes containing NHC and π - Acid Ligands).
- 4) T. P. Schlachta, M. R. Anneser, J. F. Schlagintweit, C. H. G. Jakob, C. Hintermeier, A. D. Böth, S. Haslinger, R. M. Reich, F. E. Kühn* *Chem. Commun.*, **2021**, 57, 6644-6647 (Mimicking reactive high-valent diiron- μ_2 -oxo intermediates of nonheme enzymes by an iron teracarbene complex).
- 5) J. F. Schlagintweit, P. J. Altmann, B. J. Hofmann, A. D. Böth, C. Jandl, C. Kaußler, L. Nguyen, R. M. Reich, A. Pöthig, F. E. Kühn*, *Chem. Eur. J.*, **2021**, 18, 1311-1315 (Activation of Molecular Oxygen by a Cobalt(II) tetra-NHC Complex).
- 6) M. A. Bernd, F. Dyckhoff, B. J. Hofmann, A. D. Böth, J. F. Schlagintweit, J. Oberkofler, R. M. Reich, F. E. Kühn*, *J. Catal.*, **2020**, 391, 548-561 (Tuning the electronic properties of tetradentate iron-NHC complexes: Towards stable and selective epoxidation catalysts).



Masterjahrgang 2019: Alexander Böth (3. v. links).

Die Arbeitsgruppe im Dezember 2022



Prof. Dr. Fritz E. Kühn im Dezember 2022

Alexander M. Imhof

(März 2023)

Januar 2020 – März 2023

"Peroxide-Based Chemical Oxygen Generation for Aviation Purposes – from Basic Chemistry to Prototype Design"



Abb. 75: Prof. Dr. Ueli Heiz, Dr. Alexander M. Imhof, Prof. Dr. Fritz E. Kühn, Prof. Dr. Kai Olaf Hinrichsen (v. rechts).

Gemeinsame Publikationen:

- 1) A. M. Imhof, F. E. Kühn, *Chem. in uns. Zeit* **2023**, zur Publikation *angenommen* (Sauerstoffversorgungssysteme und ihre chemischen Grundlagen).
- 2) E. M. H. J. Esslinger, J. F. Schlagintweit, G. G. Zámbo, A. M. Imhof, R. M. Reich, F. E. Kühn, *Asian J. Org. Chem.*, **2021** *10*, 2654-2662 (Effects of *trans* Axial Isocyanide Ligands on Iron(II) tetra-NHC Complexes and their Reactivity in Olefin Epoxidation).