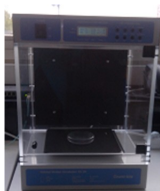


Local Ultrasound-Mediated Application of Cytostatics for the Treatment of Brain Tumors

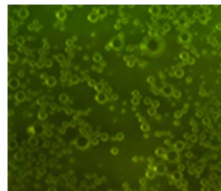
Preparation and evaluation of lipid microbubbles filled with perfluoroalkane gas for the delivery of cytostatic platinum drugs across the blood-brain barrier



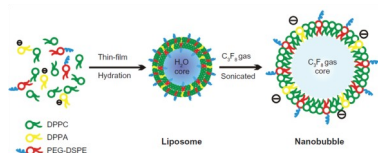
Evaporate



Sonicate



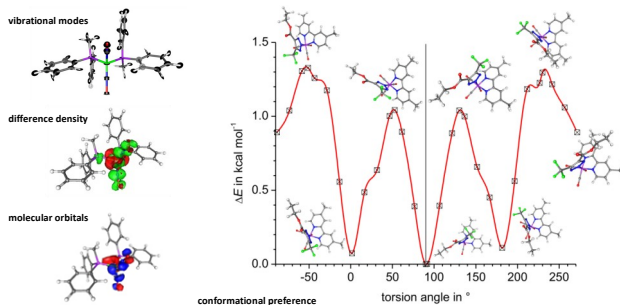
Visualize



V. Mawamba, C. Hagemann, M. Löhr, V. Sturm, U. Schatzschneider, unpublished results

Density Functional Theory

DFT calculations: conformational preference, electronic structure, IR spectra, Mössbauer parameters



lrz Leibniz-Rechenzentrum
der Bayerischen Akademie der Wissenschaften



Dalton Trans. **2014**, 43, 9986
Dalton Trans. **2014**, 43, 8664
Chem. Commun. **2014**, 50, 15692
J. Phys. Chem. Lett. **2013**, 4, 596
Inorg. Chem. **2013**, 52, 5470

In Collaboration with:

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Ingo Ott (TU Braunschweig)
Ulf-Peter Apfel, Patrick Nürnberger (Univ. Bochum)
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UK: Robert Poole (Univ. Sheffield)
USA: Emmanuel Buys (Massachusetts General Hospital Boston)

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Foto: Universität Würzburg

For further information, visit:

http://www-anorganik.chemie.uni-wuerzburg.de/en/research/prof_dr_u_schatzschneider

Bioinorganic and Medicinal Inorganic Chemistry

Prof. Dr. Ulrich Schatzschneider



Synthetic Chemistry

Small Molecules

Bioconjugates

Biological Activity

Julius-Maximilians-
UNIVERSITÄT WÜRZBURG

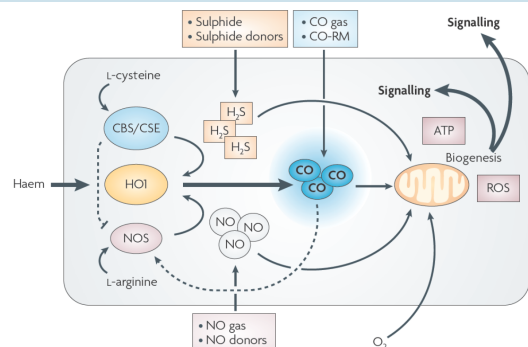
Fakultät für Chemie und Pharmazie
ANORGANISCHE CHEMIE

Bioinorganic and Medicinal Inorganic Chemistry

Our main areas of research are *bioinorganic and medicinal inorganic chemistry*. We synthesize organometal and coordination compounds for evaluation as small molecule drug candidates in cancer and microbial infections and conjugate them to biomolecules such as peptides and proteins as well as nanoscale carrier systems to probe the function of biological systems. A special focus of our work is on the biological activity of carbon monoxide, possible the smallest natural product around, which is endogenously produced by the activity of heme oxygenase (HO) enzymes. Significant efforts are also directed at the development of novel "click" reaction for *Inorganic Chemical Biology*.

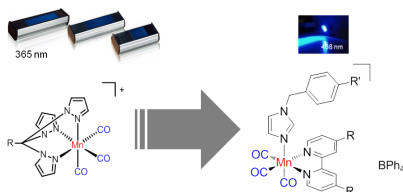
Small Signalling Molecules: CO-releasing Molecules (CORMs)

Carbon monoxide is an enzymically produced small signalling molecule in humans



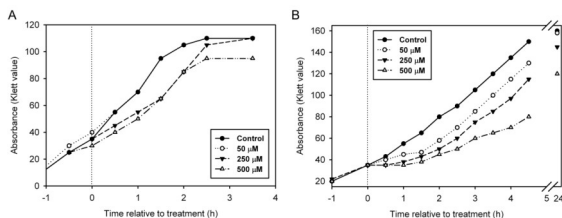
Br. J. Pharmacol., **2015**, 172, 1638
Inorg. Chim. Acta, **2011**, 374, 19
Angew. Chem. Int. Ed. **2011**, 50, 2392
Eur. Inorg. Chem. **2010**, 1451

Photoinduced release of carbon monoxide from metal-carbonyl complexes as prodrugs



Eur. J. Inorg. Chem. **2014**, 2886
Dalton Trans. **2014**, 43, 8664
J. Phys. Chem. Lett. **2013**, 4, 596
Inorg. Chem. **2013**, 52, 5470
Inorg. Chem. **2013**, 52, 9297
Chem. Commun. **2012**, 48, 11528
Inorg. Chem. **2011**, 50, 4362
Dalton Trans. **2009**, 4292
Chem. Commun. **2008**, 1798

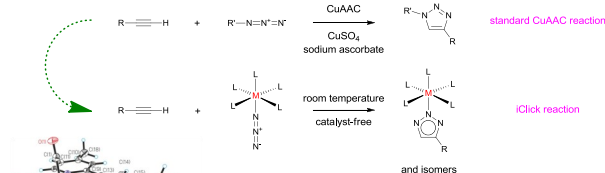
Light-triggered antibacterial activity of CO-releasing molecules (PhotoCORMs)



Antioxid. Redox. Signal. **2016**, 24, 765
Dalton Trans. **2014**, 43, 9986

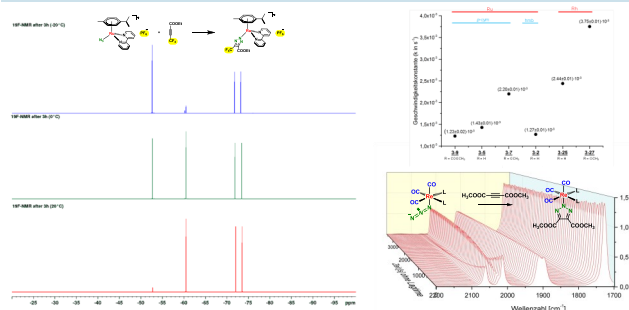
iClick Reactions

Metal-inherent reactivity for bioconjugation
modular, room-temperature, catalyst-free, bioorthogonal

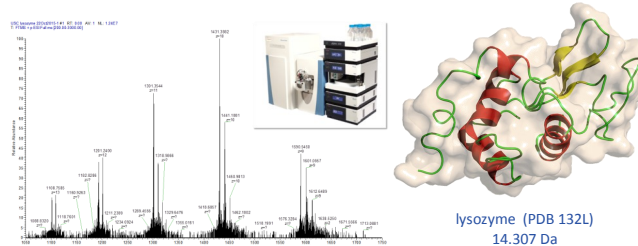


Eur. J. Inorg. Chem. **2014**, 2886
Chem. Commun. **2014**, 50, 15692
J. Organomet. Chem. **2013**, 734, 17
J. Organomet. Chem. **2009**, 694, 823
J. Inorg. Biochem. **2008**, 102, 2114

Reaction kinetics studied
by time-resolved IR and ¹⁹F NMR spectroscopy



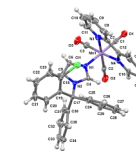
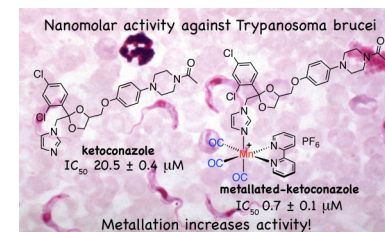
Protein bioconjugation
studied by high-resolution Orbitrap mass spectrometry



K. Lünen, S. Sauer, U. Schatzschneider, unpublished results

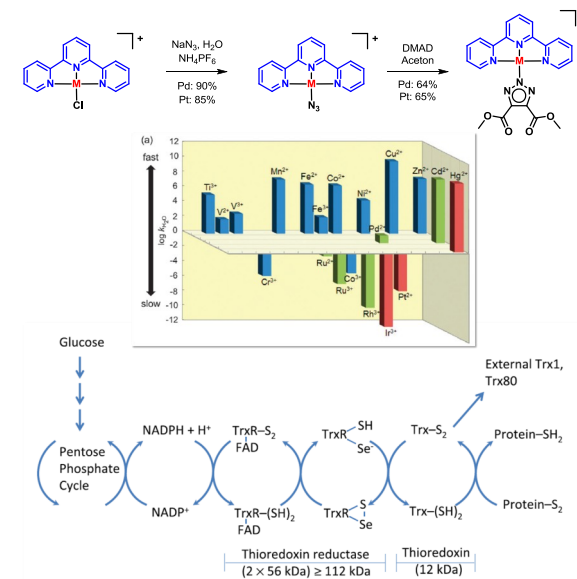
Antimicrobial and Anticancer Activity of Organometal Compounds

Novel compounds with nanomolar activity
on pathogenic bacteria as well as infections with neglected
tropical parasites such as *L. major* and *T. brucei*



Organometallics **2015**, 34, 3809
Eur. J. Inorg. Chem. **2013**, 5547
J. Biol. Inorg. Chem. **2012**, 17, 175
Dalton Trans. **2012**, 41, 6443
Dalton Trans. **2010**, 39, 2536
Bioconjugate Chem. **2010**, 21, 1288
ChemMedChem **2008**, 3, 1104
Chem. Commun. **2008**, 5604
J. Am. Chem. Soc. **2004**, 126, 8630

A surprising reversal of activity in anticancer activity:
Hints on a novel mechanism of action



P.V. Simpson, I. Ott. H. Bruhn, U. Schatzschneider, unpublished results