



REPUBLIC OF SLOVENIA  
MINISTRY OF EDUCATION,  
SCIENCE AND SPORT

University  
of Ljubljana  
Faculty of Chemistry  
and Chemical Technology



*Investing in your future*

OPERATION PART FINANCED BY THE EUROPEAN UNION  
European Social Fund

**VABILO NA PREDAVANJE  
V OKVIRU DOKTORSKEGA ŠTUDIJA  
KEMIJSKE ZNANOSTI**

**Prof. Dr. Nils Metzler-Nolte**

*Chair of Inorganic Chemistry I – Bioinorganic Chemistry, Faculty of  
Chemistry and Biochemistry, Ruhr-University Bochum, Germany*

z naslovom:

**Drug discovery and development  
from the inorganic chemistry perspective**

**v sredo, 18. marca 2015 ob 15:00 uri**  
v predavalnici 1 v 1. nadstropju Fakultete  
za kemijo in kemijsko tehnologijo, Večna pot 113

*Vljudno vabljeni!*



## Abstract

Medicinal Inorganic Chemistry is a rapidly growing and interdisciplinary field of research with firm roots in synthetic inorganic chemistry, but at the same time reaching out into enzymology, molecular and cell biology, biomedicine, and analytical chemistry.[1] Common chemical wisdom upholds that many metal complexes, especially organometallic ones, are sensitive to oxygen and moisture and thus unsuitable for biological applications. However, some of the best known drugs actually contain metal atoms, and they only work the way they do because of the presence of this alien element. One example is Cisplatin, a purely inorganic compound which is one of the three most-used anti-cancer drugs. But also novel metal complexes hold great promise for applications in medicine.

This lecture will cover some of the particular properties of metal complexes, against a background of medicinal chemistry and drug discovery and development in general. Some peculiarities of metal complexes will be discussed, and of course the particular promise that metal complexes hold will be emphasized. In a second, more specific part this lecture will exemplify some of the principles that were initially discussed by drawing examples from our own research, for example on metal-based antibiotics[2] and metal-peptide conjugates[3] for targeted drug delivery.

- [1] G. Gasser, I. Ott, N. Metzler-Nolte, *J. Med. Chem.* **2011**, *54*, 3; G. Gasser, N. Metzler-Nolte, *Curr. Opin. Chem. Biol.* **2012**, *16*, 84.
- [2] M. Patra, G. Gasser, N. Metzler-Nolte, *Dalton Trans.* **2012**, *41*, 6350; H. B. Albada, P. Prochnow, S. Bobersky, J. E. Bandow, N. Metzler-Nolte, *Chem. Sci.* **5** (2014) 4453; M. Wenzel, A. I. Chiriac, A. Otto, D. Zweytick, C. May, C. Schumacher, R. Gust, H. B. Albada, M. Penkova, U. Krämer, R. Erdmann, N. Metzler-Nolte, S. K. Straus, E. Bremer, D. Becher, H. Brötz-Oesterhelt, H.-G. Sahl, J. E. Bandow, *Proc. Natl. Acad. Sci. USA* **111** (2014) E1409.
- [3] S. D. Köster, H. Alborzinia, S. Can, I. Kitanovic, S. Wölfl, R. Rubbiani, I. Ott, P. Riesterer, A. Prokop, K. Merz, N. Metzler-Nolte, *Chem. Sci.* **2012**, *3*, 2062.