

Das **Institut für Biochemie** lädt gemeinsam mit dem Ortsverband der
Gesellschaft Deutscher Chemiker zu einem

Kolloquium der GDCh

Großer Hörsaal des Instituts für Biochemie

Felix-Hausdorff-Str. 4, Greifswald

Montag, 17. Juli 2017, 17 Uhr c.t.

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spricht zum Thema:

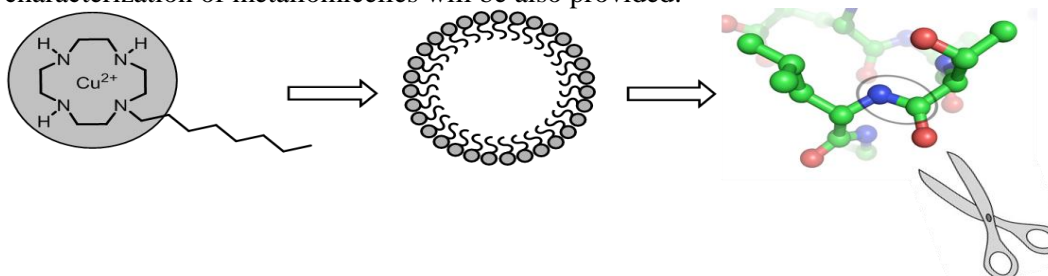
Artificial proteases based on amphiphilic metal complexes

Abstract:

In the Kulak group we develop metal complexes for the interaction with biomolecules. Our motivation is that manipulation of disease-related nucleic acids or proteins bears a potential for combating various diseases.

The degradation of pathogenic structures like amyloidogenic peptides is of high importance for therapeutic purposes. [1] Such a cleavage can be carried out by so-called proteases. As synthetic chemists we seek for small metal complexes that do the same job like natural enzymes, but come with some advantages concerning stability, price and accessibility to rational design. Some of the artificial proteases developed so far are based on metal complexes (Cu^{2+} , Co^{3+}) of the macrocyclic ligand cyclen (1,4,7,10-tetraazacyclododecane) and its oxygen analog oxacyclen (1-oxa-4,7,10-triazacyclododecane).[2] Their proteolytic activity, which has been known in the literature for a couple of years already, is relatively low though when compared to natural enzymes.[3]

In this presentation, the application of cyclen-based metal complexes as artificial metalloproteases for the cleavage of model proteins will be discussed. Approaches for increasing their efficiency will be presented: heteroatom exchange and the mono N-alkylation resulting in micelle formation. The proteolytic activity of these derivatives is comparable to that of the most efficient artificial systems known so far, which require covalent bond formation with the protein to be cleaved and immobilization on solid support, respectively.[4] Insights into the characterization of metallomicelles will be also provided.



References

- [1] J. S. Derrick, J. Lee, S. J. C. Lee, Y. Kim, E. Nam, H. Tak, J. Kang, M. Lee, S. H. Kim, K. Park, J. Cho, M. H. Lim *J. Am. Chem. Soc.* **2017**, *139*, 2234.
 [2] C. Perera-Bobusch, J. Hormann, C. Weise, S. Wedepohl, J. Dornedde, N. Kulak, *Dalton Trans.* **2016**, *45*, 10500.
 [3] S. Jang, J. Suh, *Org. Lett.* **2008**, *10*, 481.
 [4] S. H. Yoo, B. J. Lee, H. Kim, J. Suh, *J. Am. Chem. Soc.* **2005**, *127*, 9593.

Einladende

Prof. Dr. Carola Schulzke

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Vorsitzende des Ortsverbandes der GDCh