

第694回 化学・物質工学セミナー開催のお知らせ

本セミナーは、「国際的な活躍が期待できる研究者の育成」事業及び第3回5年一貫制博士課程グリーンシステム創成科学専攻の国際セミナーをかねております。万障お繰り合わせの上、ご参加下さい。

日時：平成30年5月24日（木）14:30~16:00

場所：総合教育研究棟 大講義室

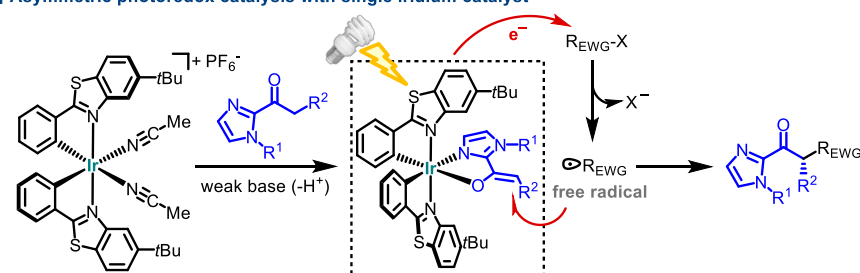
講演題目；Chiral-at-Metal Catalysts Applied to Asymmetric Photochemistry

講演者；Eric Meggers 教授（フィリップ大学マルブルグ校・ドイツ）

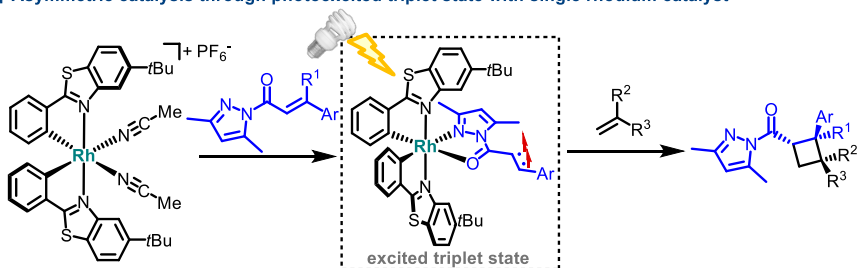
Chirality is a fundamental feature of asymmetric catalysts. Our laboratory contributed to the development of a new class of powerful chiral transition metal catalysts which are exclusively composed of achiral ligands but their asymmetric assembly around the central transition metal creates helical chirality.¹ This metal-centered chirality is responsible for the asymmetric induction during catalysis. Interestingly, bis-cyclometalated chiral-at-metal Ir^{III} and Rh^{III} chiral Lewis acids are capable of intertwining visible light photoactivation with asymmetric catalysis.^{2,3}

Initial work focused on asymmetric photoredox catalysis.⁴⁻⁵ Noteworthy, in all these reactions, a single catalyst serves both as the chiral Lewis acid catalyst and at the same time as the precursor for an *in situ* assembled photoactive species. Recently we expanded this approach to asymmetric reactions that directly occur from a photoexcited state.^{8,9} This line of research will be discussed in the lecture.

■ Asymmetric photoredox catalysis with single iridium catalyst



■ Asymmetric catalysis through photoexcited triplet state with single rhodium catalyst



Literature:

1. L. Zhang, E. Meggers, *Chem. Asian J.* **2017**, *12*, 2335.
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3. J. Ma, X. Zhang, X. Huang, S. Luo, E. Meggers, *Nat. Protocols* **2018**, *13*, 605.
4. H. Huo, X. Shen, C. Wang, L. Zhang, P. Röse, L.-A. Chen, K. Harms, M. Marsch, G. Hilt, E. Meggers, *Nature* **2014**, *515*, 100.
5. H. Huo, C. Wang, K. Harms, E. Meggers, *J. Am. Chem. Soc.* **2015**, *137*, 9551.
6. C. Wang, J. Qin, X. Shen, R. Riedel, K. Harms, E. Meggers, *Angew. Chem. Int. Ed.* **2016**, *55*, 685.
7. H. Huo, K. Harms, E. Meggers, *J. Am. Chem. Soc.* **2016**, *138*, 6936.
8. X. Huang, T. R. Quinn, K. Harms, R. D. Webster, L. Zhang, O. Wiest, E. Meggers, *J. Am. Chem. Soc.* **2017**, *139*, 9120.
9. X. Huang, X. Li, X. Xie, R. Riedel, E. Meggers, *Nat. Commun.* **2017**, *8*, 2245.