ICS-OTRI講演会のご案内

演者：**Professor Thomas Ward**

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題目：**Artificial Metalloenzymes for Carbene and Nitrene Chemistry: Challenges and Opportunities**

場所：C1棟２階　講義室 (C1-211)

日時：令和５年１１月２４日（金）１６：１５－１７：３０

November 24 (Fri) 16:15 – 17:30

Artificial metalloenzymes (ArMs) have attracted increasing attention in the past two decades as attractive alternatives to either homogeneous catalysts or enzymes. Artificial metalloenzymes result from anchoring a catalytically competent abiotic metal cofactor within a host protein.[1-2] The resulting ArMs combine attractive features of both homogeneous- and bio-catalysts. Most importantly, they enable access to new-to-nature reactions, thanks to the availability of the entire periodic table. In addition, the host protein can be subjected to genetic optimization. Relying on either streptavidin or human carbonic anhydrase as host protein for anchoring the organometallic cofactor, we have optimized the performance of ArMs for sixteen different reactions.
Following a general introduction to the underlying principles of ArMs, this talk will highlight our recent progress in engineering and evolving such hybrid catalysts for olefin metathesis, carbene insertion, and nitrene insertion. A particular emphasis will be on combining ArMs with natural enzymes and performing catalysis in a cellular environment.

References:

[1] H. J. Davis, T. R. Ward, ACS Cent. Sci., 2019, 5, 1120.
[2] F. Schwizer, Y. Okamoto, T. Heinisch, Y. Gu, M. M. Pellizzoni, V. Lebrun, R. Reuter, V. Köhler, J. C. Lewis and T. R. Ward, Chem. Rev. 2018, 118, 142.

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