

Seminar

Title:

**“Catalysis in Complex Mixtures: From Synthetic Methods
to the Origin of Life”**

Speaker:

Joseph Moran

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Date:

Wednesday, October 4th - 2017 at 3 PM

Local:

Room A501-507

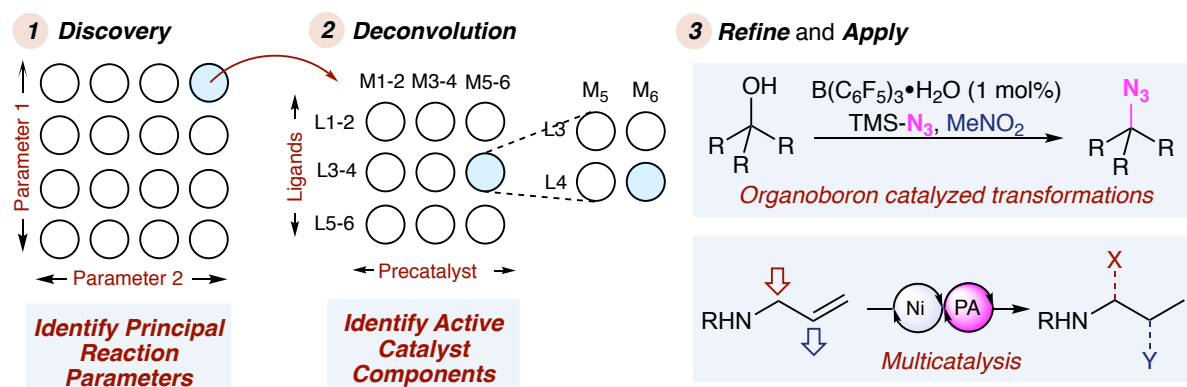
Catalysis in Complex Mixtures: From Synthetic Methods to the Origin of Life

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In the classical approach to the development of homogeneous catalysts, chemists typically aim to minimize the number of components in the flask in order to reduce complexity and avoid potential catalyst poisoning. Yet, life and its many complex catalytic reactions almost certainly arose from complex mixtures. This talk will describe our efforts to generate, screen and deconvolute complex mixtures of catalysts, a technique that can dramatically reduce the number of reactions required to obtain a lead result if employed rationally.[1] Mechanistic investigations into the “hits” obtained from this process are then leveraged to develop new second-generation catalytic transformations and multicatalytic sequences for organic synthesis.[2,3] I will conclude the talk by presenting how this approach was used to find simple non-enzymatic catalysts potentially relevant to the origin of biological metabolism.[4]



[1] (a) E. Wolf, E. Richmond, J. Moran, *Chem. Sci.* **2015**, 6, 2501. (b) For an overview of our recent work in this area, see: E. Richmond, J. Moran, *Synlett* **2016**, 27, 2637.

[2] (a) Richmond, J. Moran, *J. Org. Chem.* **2015**, 80, 6922. (b) E. Richmond, I. U. Khan, J. Moran, *Chem. Eur. J.* **2016**, 22, 12274.

[3] (a) M. Dryzhakov, M. Hellal, E. Wolf, F. Falk, J. Moran, *J. Am. Chem. Soc.* **2015**, 137, 9555. (b) M. Dryzhakov, J. Moran, *ACS Catalysis* **2016**, 6, 3670. (c) V. Vukovic, E. Richmond, E. Wolf, J. Moran, *Angew. Chem. Int. Ed.* **2017**, 56, 3085.

[4] K. B. Muchowska, S. J. Varma, E. Chevallot-Beroux, L. Lethuillier-Karl, G. Li, *Nature Eco. Evo.* **2017**, in press.