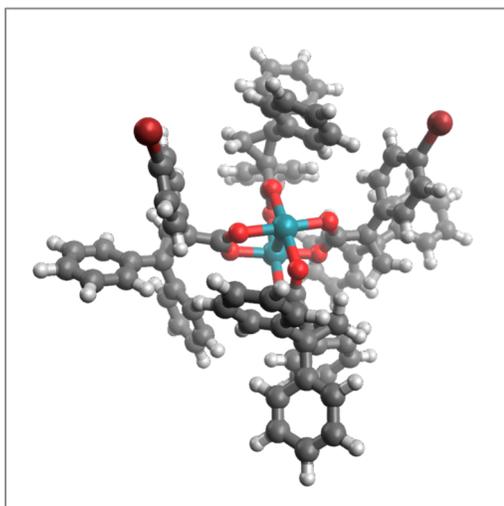


# Center for Selective C–H Functionalization Press Release

FOR IMMEDIATE RELEASE

## **Bulkier is better for primary C–H bonds** *New catalyst design selects exclusively for primary C–H bonds*

June 2014, Atlanta GA – Researchers at Emory University, led by Prof. Huw Davies, a synthetic organic chemist, have designed a new family of rhodium(II)-catalysts that offers a level of control that will significantly expand the scope of C–H functionalization, a technique set to revolutionize the way we put together organic molecules.



Metallo-Carbenes have been demonstrated to be highly effective reagents for selective C–H insertion and C–C bond formation. The major challenge in this field is selecting a particular C–H bond from the plethora commonly present in an organic molecule. The site of reaction is determined by a fine balance between the steric and electronic properties of both the substrate and catalyst. More established rhodium(II)-catalysts have shown a predilection for electron-rich secondary C–H bonds. However a new class of rhodium(II)-catalysts, the ligands for which are based on cyclopropanes, themselves synthesized using rhodium(II)-carbenoids, demonstrate a very different selectivity profile. Reaction with these new catalysts no longer reacts preferentially at secondary C–H bonds, instead favoring the more sterically accessible, but less electronically stabilized primary C–H bonds.

While this work is still at an early stage, this level of control takes the field one step closer to realizing a key long term goal; development of a ‘toolbox’ of catalysts that will allow the selective reaction of different C–H bonds within an organic molecule. “This is a major advance for our group in our

quest to control which C-H bond is functionalized in a complex molecule by simply choosing the appropriate catalyst”, stated Huw Davies, the corresponding author of this publication.

**Article:** Role of Sterically Demanding Chiral Dirhodium Catalysts in Site-selective C–H Functionalization of Activated Primary C–H bonds, C. Qin and H. M. L. Davies, *J. Am. Chem. Soc.*, **2014**, *136* (27), 9792-9796.

<http://pubs.acs.org/doi/abs/10.1021/ja504797x>

Contact Author: Huw Davies  
Address: Department of Chemistry  
1515 Dickey Drive  
Atlanta, GA, 30322  
Email: hmdavie@emory.edu

CCHF Contact: Daniel Morton  
Department of Chemistry  
Emory University, Atlanta, GA, 30322  
Daniel.morton@emory.edu  
404-727-5177

Organic molecules form the basis of much of modern science, from medicines to materials. Synthetic organic chemistry is the art of constructing these molecules. The Center for Selective C–H Functionalization is a network of researchers from 15 institutes across the USA that is leading a revolution in synthetic organic chemistry, making molecules in a faster, cleaner and cheaper way.

Find out more at our website: <http://www.nsf-cchf.com>

###

