Investigating the benfits of incorporating carbohydrates into NHC systems for catalytic applications

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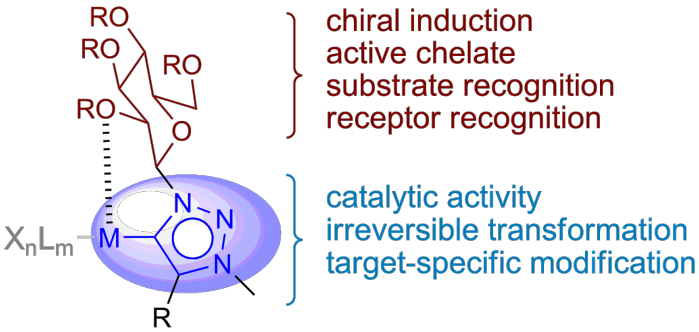
N-Heterocyclic carbenes (NHC) have been shown to act as versatile ligands for catalysis[1]. In particular, we have shown the promise of 1,2,3-triazolylidines as a class of NHC with wide-ranging applications in catalysis, as well as materials science and biochemistry.[2] This class of NHC may be conveniently constructed through the modular CuAAC 'click' reaction, thereby giving access to a broad range of functionality compared to ligand systems which must be prepared *via* harsher reaction conditions. Carbohydrates come from the natural pool of chirality and functionality and therefore represent an attractive class of substituent for providing defined stereochemistry and geometry to ligands, as well as being readily available; indeed carbohydrates have been used as scaffolds for phosphine and phosphinite ligands and shown promise for catalysing asymmetric transformations.[3] Similar work with NHCs is scarce.[4] Combining these two important classes of compound into a hybrid system will give rise to synergistic advantages. Here, we present a number of new carbohydrate-NHC hybrid ligands for catalysis and report preliminary investigations into their activity, exploring relationships between activity and structure.



[1] L. Mercs, M. Albrecht, *Chem. Soc. Rev.* **2010**, 39, 1903; M. Melaimi, M. Soleilhavoup, G. Bertrand, *Angew. Chem. Int. Ed.* **2010**, 49, 8810.
[2] P. Matthew, A. Neels, M. Albrecht, *J. Am. Chem. Soc.***2008**, 130, 13534.
[3] S. Woodward, M. Dieguez, O. Pamieez, *Coord. Chem. Rev.* **2010**, 254, 2007.
[4] For example: A. S. Henderson, J. F. Bower, M. C. Galen, *Org. Biomol. Chem.***2014**, 12, 9180; K. J. Kilpin, S. Crot, T. Riedel, J. A. Kitchen, P. J. Dyson, *Dalton Trans.***2014**, 43, 1443.