

# Pd, Au and Ag in C-H Activation:

## Reactivity and selectivity control in the synthesis of biaryls

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# Pd, Au and Ag in C-H Activation: Reactivity and Selectivity Control in the Synthesis of Biaryls

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The development of greener and more efficient synthetic methodologies is essential for organic chemistry to reach its full potential in its application to many applied and fundamental scientific problems. *Direct C-H arylation*, where a readily available Ar-H is coupled with Ar-X, and *oxidative double C-H activation*, where two different Ar-H are cross-coupled, have emerged in the last few years as promising alternatives to traditional cross-couplings. These approaches use non-prefunctionalized starting materials, thus eliminating several synthetic steps and the associated waste en route to the desired cross-coupling adducts. However, several challenges have to be resolved before this new approaches can be widely applied: 1) the development of mild reaction conditions with a broad scope, 2) the control of the regioselectivity of C-H activation and, in the case of oxidative couplings, 3) the control of the selectivity of homo- versus cross-coupling.

In this talk I will present some of our group's approaches towards addressing these challenges. In particular, we will discuss bimetallic synergistic systems utilizing Pd/Ag, Pd/Cr and Au/Ag based methodologies that allow enhanced selectivity control and reactivity.



Igor Larrosa was born in Barcelona, Spain. He received his undergraduate education at the Universitat de Barcelona (1999) where he also underwent M.Sc. and Ph.D. studies with Felix Urpi and Pere Romea working on asymmetric synthesis. During this time he also carried out a research placement in Professor Erick M. Carreira's laboratories at ETH Zurich, Switzerland. Igor moved to the UK in 2005 to carry out postdoctoral research in Professor Anthony G. M. Barrett's group at Imperial College London, where he was appointed group leader. In IC, Igor completed the total synthesis of clavilactone, featuring a key three-component benzyne coupling. In September 2007 he started his independent career as a Lecturer in synthetic organic chemistry at Queen Mary University of London, and was promoted to Senior Lecturer in 2011 and to Reader in Catalysis in 2012. In October 2014, Igor moved to the University of Manchester, to take up a Chair in Organic Chemistry. He is the recipient of an ERC Starting Grant. His current research interests are in the area of catalysis, with particular emphasis in the

development of novel transition metal catalysed transformations involving C-H and C-C activations.