

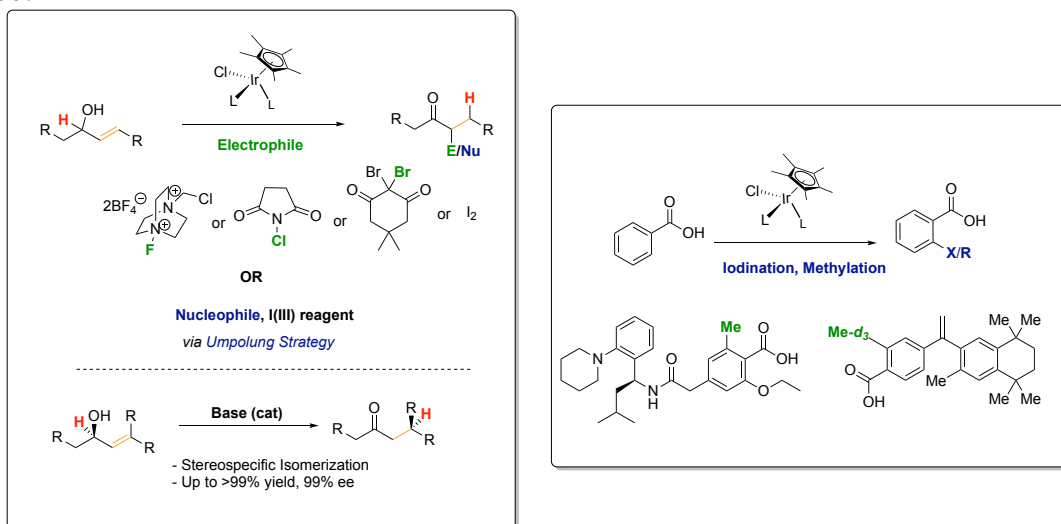
## Catalytic Methods for C–H Functionalizations and Application to Late-Stage Diversification

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Our latest investigations on the development of catalytic methods for synthesizing heteroatom-functionalized building blocks and advanced drug-like molecules will be presented. The use of a family of simple P,N-ligandless complexes, with the general formula [Cp\*Ir(III)] have been used for tandem 1,3-hydride shift / functionalization of allylic alcohols, as well as for the functionalization of C-H bonds in benzoic acids. Our attempts to develop asymmetric halogenation reactions resulted on the development of a novel organocatalytic stereospecific reaction mediated by a simple base, and which relies on the in-situ formation of ions pairs with induced non-covalent chirality. The scope as well as the mechanisms of these reactions will be presented.



### References:

[1] **Metal-catalysis:** *Chem. Commun.* **2011**, 47, 8331-8333; *Angew. Chem. Int. Ed.* **2013**, 52, 6273; *Chem. Eur. J.* **2014**, 20, 10703; *ACS Catalysis*, **2015**, 5, 708; *ACS Catalysis* **2015**, 5, 3704; *Chem. Commun.* **2017**, 53, 9842; *ACS Catal.*, **2018**, 8, 920; *Chem. Eur. J.* **2020**, 26, 14978; *Nature Commun.* **2019**, 10, 524450; *Chem. Eur. J.* **2020**, 26, 1018; *iScience* **2021**, 24, 102467; *JACS Au* **2022**, 2, 906; *Chem* **2022**, 8, 3302.

[2] **Organocatalysis:** *J. Am. Chem. Soc.* **2016**, 138, 13408; *ACS Catalysis*, **2019**, 9, 9134; *Org. Lett.* **2020**, 22, 4123; *Org. Lett.* **2022**, 24, 3867.



**Belén Martín-Matute** was born in Madrid. She obtained her Licenciante in Organic Chemistry at the Universidad Autónoma de Madrid in 1998. She then joined the group of Prof. A. M. Echavarren where she received her doctoral degree with *sobresaliente cum laude* in 2002 working on TM-catalysed reactions: intramolecular arylations and cyclisations of furans with alkynes. In 2003, she joined the group of Prof. J.-E. Bäckvall at Stockholm University for her postdoctoral studies where she worked on the dynamic kinetic resolution of *sec*-alcohols combining ruthenium and enzyme catalysts. She spent two more years in the group of Prof. J. C. Carretero in Madrid working on asymmetric catalysis. In October 2007, she returned to Stockholm University as Assistant Professor, where she became Associate Professor in 2012, and Full Professor in 2014. Belén Martín-Matute leads activities on the development of new catalytic processes to produce carbon-carbon and carbon-heteroatom bonds. This includes converting water, carbon dioxide, and other renewable resources into chemical products without having to deal with hazardous intermediates. A very important aspect of her work deals with the synthesis of heterogeneous catalysts based on porous metal-organic frameworks (MOFs). In Belén Martín-Matute's research, sustainability is also prioritized by using environmentally friendly solvents and versatile, stable and structurally simple but yet effective catalysts. She received the Young Investigator Award from the Spanish Royal Society of Chemistry / Sigma Aldrich in 2007, the Lindbomska Award from the Swedish Academy of Sciences in 2013, and the Göran Gustafsson (GG) Award by the GG Foundation. She currently serves as advisory board member for ACS Sustain. Chem. Eng. and she is an advisory board member for *Chem. Eur. J.* Since November 2021, she is an associate editor for *Organic Letters*.



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