

# Catalysis to increase complexity: stereoselective synthesis of $sp^3$ - rich building blocks

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Jueves, 19 de mayo 2022  
12:30h

Sala de grados, Edif. Físicas (Facultad Ciencias)

CICLO CONFERENCIAS ISQCH 2022



Instituto de Síntesis Química y Catálisis Homogénea

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## Abstract

Transition metal catalysis is a powerful tool for the creation of stereocenters in organic molecules. Both, the use of a chiral catalyst or a chiral starting material, are valuable and complementary approaches to accomplish this goal. In our group, we have recently focused on the development of metal-catalyzed enantioselective and stereospecific transformations, in the context of carbon-boron bond formation and carbon-nitrogen bond cleavage. These methods have allowed us to prepare a broad variety of useful synthetic intermediates, with a special focus on functionalized small rings. Some of these transformations will be presented in this talk.

## CV:



Mariola Tortosa obtained her B.S. in Chemistry from the Universidad Autónoma de Madrid (UAM) in 1999. She then joined the group of Dr. R. Fernández de la Pradilla at the Instituto de Química Orgánica General (CSIC, Madrid, Spain) to carry out her graduate work on the development of new asymmetric methods using chiral sulfoxides. In 2004, she received the Lilly Award for PhD students. In 2005, she moved to The Scripps Research Institute in Florida (USA) to work as a Postdoctoral Fellow with Prof. William Roush. Her research in Florida was directed toward completion of the total synthesis of the antitumor agent Superstolide A using a transannular Diels–Alder strategy. In 2008 she returned to the Instituto de Química Orgánica General (Madrid, Spain) as a Juan de la Cierva fellow. In 2011 she started her independent research at the Universidad Autónoma de Madrid with a Ramón y Cajal contract. In 2013, she received an ERC-Starting Grant awarded by the European Research Council to work on the project “Design and Applications of Unconventional Borylation Reactions” and more recently and ERC-Consolidator Grant to work on the project “Selective Pathways for Carbon-Nitrogen Bond Cleavage”. Her research interests include boron chemistry, asymmetric catalysis and the synthesis of biologically active compounds. In 2014 she received the Young Investigator Award from the Royal Society of Chemistry of Spain and the Young Spanish Investigator Eli Lilly Award. In 2015 she received the Thieme Chemistry Journal Award for young professors and in 2021 the Barluenga Medal. In December 2017, she was promoted to Profesor Contratado Doctor and in December 2021 to Profesor Titular. She serves as an Associate Editor of the ACS journal *Organic Letters* and is member of the International Advisory Board of the journal *Angewandte Chemie International Edition*.