

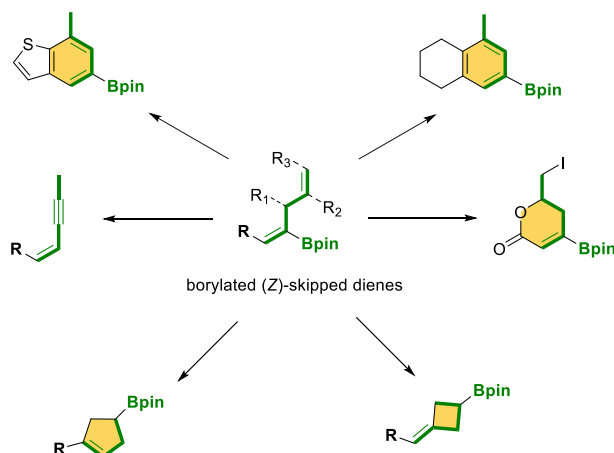
## Organoboron chemistry to build highly strained polyfunctionalized cyclic systems

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The relevance of skipped diene motifs in natural products preparation has led to new strategies for the *de novo* synthesis.<sup>[1]</sup> 1,1-Diborylalkenes can be transformed into (Z)-skipped dienes through Cu(I)-phosphine catalyzed allylic coupling reactions. The energetically preferred formation of (Z)- $\alpha$ -borylalkenyl copper(I) species and the subsequent nucleophilic attack, explains the stereoselective nucleophilic substitution with allyl bromides. The eventual treatment of (Z)-skipped dienes with diverse bases promotes cyclization/aromatization patterns via enyne intermediates.<sup>[2]</sup> Alternatively, borylated (Z)-skipped dienoates followed a feasible iodo-lactonization sequence to prepare borylated lactone cores with interest in drug discovery.<sup>[3]</sup> To complete the picture of relevant interest of borylated skipped diene motifs, remote 1,3- or 1,4-boryl migration has been developed to serve as the basis to synthetic access of strained cyclic systems.<sup>[4,5]</sup>



### References:

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**Prof. dr. Elena Fernández** is the leader group of a research line devoted to study Catalytic Organoboron Chemistry. She received her degree in chemistry at the University of Barcelona in 1991. She subsequently did graduate work in catalytic hydroformylation of sugars with Prof. Sergio Castillón at the University Rovira i Virgili, from which she earned her Ph.D. in 1995. The following two years, she moved at the University of Oxford (UK) to a postdoctoral position with Prof. John M. Brown where her studies culminated with an approach towards the first catalytic asymmetric hydroboration-amination reaction. She accepted a lecturer position at the University Rovira i Virgili, becoming part of the permanent staff in 2000. She is full professor from 2019 and obtained the Award on Excellence of Research in Organometallic Chemistry 2014, and the Award on Excellence of Research in Chemistry 2017, both from the Spanish Royal Society of Chemistry. She is Distinguished Professor at the URV from 2018.

The main objective of her scientific campaign is the generation of knowledge and awareness about activation modes of borane reagents to be used in organoboron synthesis. The advantages of developing new innovative organocatalytic borylative approaches are based on the use of versatile inexpensive intermediates without losing the prospects in efficiency and selectivity. The precedents in organoboron selective synthesis of multifunctional compounds, attracts the interest from academia and industry to promote assisted routes for target compounds, such as fungicides and pharmaceuticals, even at gram scale preparations. Intrinsic data about the suggested mechanisms and spectroscopic evidences, that supports the innovative theories, are part of Elena Fernández's research goals to understand the new trends and generate inspiration for future discoveries in the field. The main achievements in her group have been published in about 150 articles of prestigious international journals, as well as 18 chapters of books, and 4 patents, being one under exploitation. She is the editor of two books on Synthesis and Applications of Organoboron Compounds for Springer (2015) and Advances in Organoboron Chemistry toward Organic Synthesis for Science of Synthesis-Thieme (2019). Since 2020, she is the permanent Volume Editor for Science of Synthesis Knowledge Updates, Volume 6, overseeing the future content in the general area of developments in organoboron chemistry, with the focus on updates and covering new methods for the synthesis and applications of organoboron compounds. She collaborates with international leaders in the organoboron chemistry field and has an active campaign to transfer the knowledge to industry throughout contracts with Sanofi, Maystar, and Syngenta. She is elected member of the Young Academy of Europe (YAE) and president of the EuChemSoc division of Green and Sustainable Chemistry and Chair of the Editorial board of ChemSusChem. She is in the advisory board of the journals ACS Sustainable Chemistry and Engineering and Chem Catalysis.

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