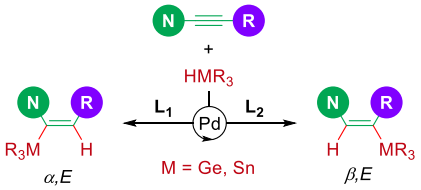
March 25th 2022 – Strasbourg

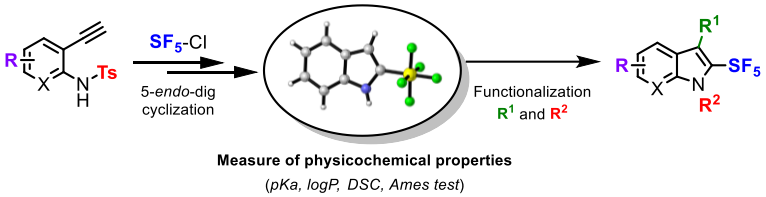
How to take advantage of polarized C≡C bonds reactivity?

Dr. Vincent Bizet
Université de Haute-Alsace, Université de Strasbourg, CNRS
LIMA, UMR 7042, 68100 Mulhouse – France
vbizet@unistra.fr

Our group develops synthetic methods oriented towards the construction of functionalized nitrogen heterocycles,[1] and with a special interest for the reactivity of polarized alkynes. Indeed, depending on the substitution of alkynes, by electron-donating or electron-withdrawing groups, regio-, chemo- and stereoselective transformations can be performed. With the help of organometallic catalysis, the innate selectivity of polarized alkynes can be enhanced or inverted by a wise tuning of the catalytic conditions. Recently, we used this strategy to develop regiodivergent palladium-catalyzed hydrometallation of ynamides. The reaction mechanism has been rationalized by experimental evidences and theoretical computations.[2]



Our group is also highly interested by "emerging fluorinated" groups such as the pentafluorosulfanyl group (SF_5), a highly polar, lipophilic and strong electron-withdrawing group. To date, synthetic strategies to construct nitrogen heterocycles bearing a SF_5 are limited and physicochemical properties of SF_5-containing products are scarce in the literature. We recently achieved the synthesis of 2-SF_5-(aza)indoles following a telescoped sequence making this strategy very appealing and reproducible on gram scale. In collaboration, we also performed Ames test, pKa, log P, and differential scanning calorimetry measurements of several fluorinated 2-R_f-indoles to rationalize the impact of the introduction of SF_5-moiety into heteroaromatics.[3]



[1] V. Le Fouler, Y. Chen, V. Gandon, V. Bizet, C. Salome, T. Fessard, F. Liu, K. N. Houk, N. Blanchard *J. Am. Chem. Soc.* **2019**, *141*, 15901

[2] V. Debrauwer, A. Turlik, L. Rummler, A. Prescimone, N. Blanchard, K. N. Houk, V. Bizet *J. Am. Chem. Soc.* **2020**, *142*, 11153.

[3] V. Debrauwer, I. Leito, M. Lõkov, S. Tshepelevitsh, M. Parmentier, N. Blanchard, V. Bizet *ACS Org. Inorg. Au* **2021**, *1*, 43-50.