

# VISIBLE LIGHT PHOTOINDUCED REDUCTIVE COUPLING OF *N*-TOSYLHYDRAZONES WITH AMINES FOR Csp<sup>3</sup>-N BOND FORMATION



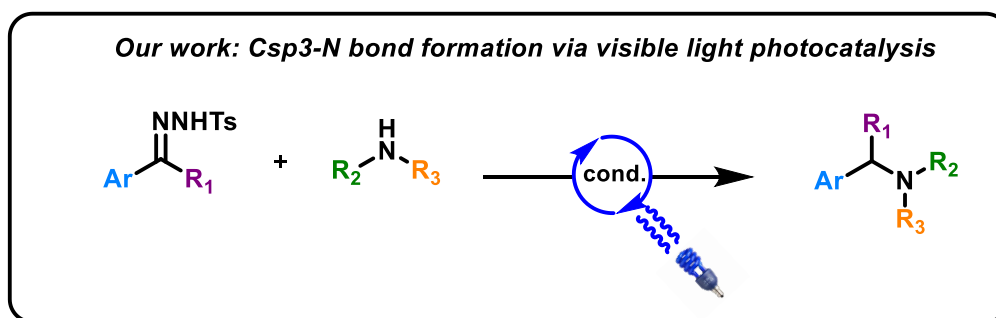
**Clara Faure, Diana Lamaa, Philippe Belmont, Etienne Brachet**

Université Paris Cité, UMR 8038 CNRS, Faculté de Pharmacie de Paris,  
4 Av. de l'Observatoire, 75006, Paris, France

Carbon-Nitrogen (C-N) bond formation remains one of the main challenges in organic chemistry due to its ubiquitous presence in natural products and drugs. In consequence, it is important to develop efficient strategies for the C-N bond formation. In this field, we can cite Buchwald-Hartwig<sup>1</sup> reaction which is a pallado-catalysed cross coupling reaction to build the C-N bond. However, the required harsh conditions may limit the application of such strategies. Thus, milder synthetic methods must be developed to circumvent actual limitations.

In the nitrogen containing family, we can cite  $\alpha$ -Branched arylamines which are an interesting class of molecules because of their pharmaceutical properties<sup>2</sup>. Different strategies have been explored until now to develop new ways for their formation. However, the use of rare and expensive transition metals<sup>3</sup> and/or hard conditions implies the development of new synthetic pathways.

In our laboratory, we focused our research projects on the development of new photoredox synthetic method to build efficiently the C-N bond. Thus, an innovative metal-free method has been developed in order to synthesize  $\alpha$ -Branched arylamines from *N*-Tosylhydrazones and primary/secondary amines, without the need of any addition transition metal and using visible light as the only energy source. Thanks to these conditions, access to a variety of scaffolds is now possible. In this presentation, optimization of the reaction condition, scope evaluation and mechanistic studies will be presented.



## References

<sup>1</sup> (a) D. S. Surry, S. L. Buchwald, *Chem. Sci.*, **2010**, 1, 13-31. (b) D. S. Surry, S. L. Buchwald, *Chem. Sci.*, **2011**, 2, 27. (c) J. F. Hartwig, *Acc. Chem. Res.*, **2008**, 41, 1534-1544. (d) G. Evano, N. Blanchard, M. Toumi, *Chem. Rev.*, **2008**, 108, 3054-3131

<sup>2</sup> (a) P. Singh, M. K. Singh, D. Chaudhary, V. Chauhan, P. Bharadwaj, A. Pandey, N. Upadhyay, R. K. Dhaked, *PLoS ONE* **2012**, 7, e47110. (b) M. Kato, K. Komoda, A. Namera, Y. Sakai, S. Okada, A. Yamada, K. Yokoyama, E. Migita, Y. Minobe, T. Tani, *Chem. Pharm. Bull.* **1997**, 45, 1767-1776. (c) P. E. Brandish, J. C. Hershey, M. E. Fraley, J. T. Steen, Patent WO2008118319 A2, **2008**.

<sup>3</sup> (a) T. C. Nugent, M. El-Shazly, *Adv. Synth. Catal.*, **2010**, 352, 753-819. (b) D. Raydan, B. Royo, M. Manuel B. Marques, *Asian J. Org. Chem.*, **2023**, 12, e202300282.