

# New Synthetic Methods Based on Halogen-Atom Transfer and Photoexcited Nitroarene Chemistry

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In this presentation I will highlight recent work from my group focused on the use of photochemistry and photocatalysis to aid the synthesis of high-value molecules. The presentation will focus on:

- **Photoexcited nitroarene chemistry.** Nitroaromatics are widely available feedstocks that are routinely used for the preparation of anilines. I will present our most recent work that demonstrates how these species can be used, upon blue light irradiation, to promote the ozonolysis-style cleave of olefins<sup>1</sup> and also allow preparation of complex and highly functionalised saturated heterocycles.
- **Halogen-atom transfer (XAT).** Organic halides are valuable building blocks for the generation of alkyl and aryl radicals. However, their applications in photoredox catalysis can be difficult owing to their very negative reduction potentials. I will present our recent work focused on the use of  $\alpha$ -aminoalkyl radicals<sup>3</sup> and cyclohexadienyl radicals<sup>4</sup> as XAT mediators for the homolytic activation of alkyl iodides and bromides and their application in synthesis.<sup>3</sup>

1. A. Ruffoni, C. Hampton, M. Simonetti and D. Leonori \* **2022**, *610*, 81.

2. T. Constantin, M. Zanini, A. Regni, N. S. Shikh, F. Julia\* and D. Leonori\* *Science* **2020**, *367*, 1021.

3. T. Constantin, B. Gorski, M. J. Tilby, S. Chelli, H. Zipse, S. Lakdhar\* and D. Leonori\* *Science* **2022**, *377*, 1323.