Exploring new avenues in photocatalysis through unconventional radical acceptors

Dr Mattia Silvi ‡

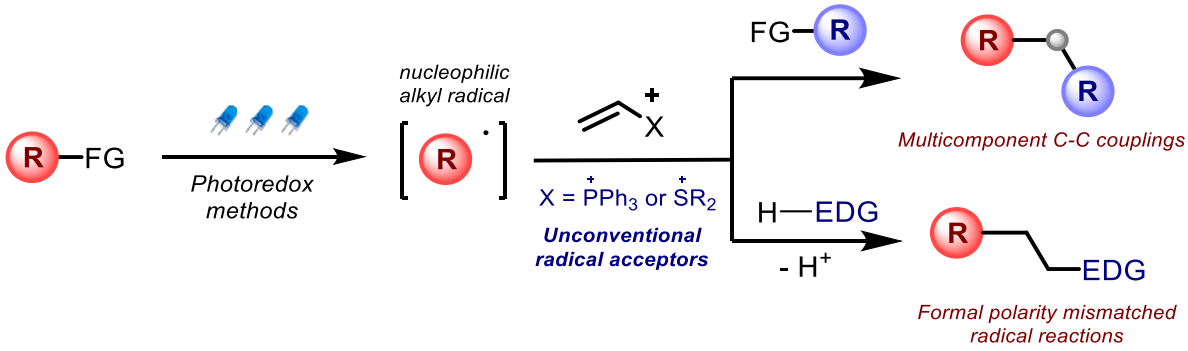
‡ GSK Carbon Neutral Laboratory for Sustainable Chemistry, The University of Nottingham. 6 Triumph Rd, Nottingham, United Kingdom.

email: Mattia.Silvi@nottingham.ac.uk

Over the past decade, radical chemistry has witnessed a renaissance, triggered by the introduction of novel methods to generate reactive radical species under remarkably mild conditions (e.g., photoredox catalysis).[1] While these novel strategies stimulated many exciting conceptual and practical innovations in the field of organic chemistry, a number of long-standing synthetic challenges still remain unsolved.

We have recently introduced the use of unconventional radical acceptors in photoredox radical chemistry (e.g., vinyl phosphonium and sulfonium ions).[2-3] This allowed us to develop a practical reactivity framework for the chemo- and stereo-controlled C-C functionalisation of unmodified complex molecules, as well as to tackle traditionally accepted scope limitations of radical chemistry (i.e., polarity mismatch in radical addition to alkenes).

These novel methodologies aim to open new opportunities in organic chemistry, extending the chemical space available to scientists for the development of the molecules of tomorrow.



References:

[1] Prier, C. K.; Rankic, D. A.; MacMillan, D. W. C. *Chem. Rev.* **2013**, *113*, 5322–5363.

[2] Filippini, D.; Silvi, M. *Nat. Chem.* **2022**, *14*, 66–70. b) Filippini, D.; Silvi, M. *Synlett* **2012**, *33*, 1011–1016. (invited *Synpacts* contribution)

[3] Paul, S.; Filippini, D.; Silvi, M. *J. Am. Chem. Soc.* **2023**, *145*, 2773–2778.