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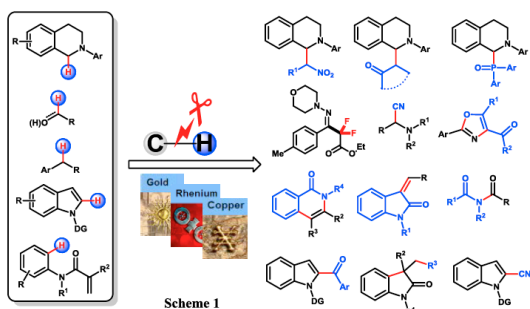
OR16 – Photoredox Catalyzed C–H Bond Functionalization and Access to Fluorinated Compounds

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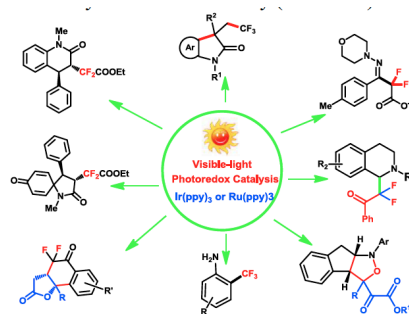
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The C–H functionalization is a perennial topic of interest for organic chemists, it is a great challenging task to accomplish highly selective C–H bond functionalization under mild conditions. In the past a few years, the directed alkylation, cyanation, oxidation, amination, acylation and phosphonation of C–H bond were realized in our laboratory, with transition metal (Au, Re, Rh, Cu, etc.) catalysis or metal-free conditions. With those transformation methods, different kind of heterocyclic compounds were effectively constructed as shown in Scheme 1.<sup>1</sup> Owing to its significant advances in energy-saving and environmentally benign features, visible-light photoredox catalysis has witnessed rapid development and attracted considerable attention in both academia and industry. The incorporation of a fluorinated group into organic molecules is particularly intriguing because of its significant applications in the life sciences. Recently, our group achieved visible-light-induced trifluoromethylation and difluoroalkylation with different kind of fluoro reagents, several kinds of fluorinated compounds were synthesized efficiently (Scheme 2).<sup>2</sup>



Scheme 1



Scheme 2

References

1. *Chem. Soc. Rev.*, **2014**, 43, 5245; *Angew. Chem. Int. Ed.* **2012**, 51, 1252; *Angew. Chem. Int. Ed.* **2013**, 52, 6288; *Angew. Chem. Int. Ed.* **2016**, 55, ASAP (DOI: 10.1002/anie.201511917); *Chem. Commun.* **2016**, 52, 447; *Chem. Commun.* **2015**, 51, 1320; *Chem. Commun.* **2015**, 51, 3786; *Chem. Commun.* **2013**, 49, 819; *Chem. Commun.* **2013**, 49, 2933; *Chem. Commun.* **2013**, 49, 3700; *Chem. Eur. J.* **2013**, 19, 1914; *Chem. Eur. J.* **2013**, 19, 9754; *Chem. Eur. J.* **2013**, 19, 11553; *Chem. Eur. J.* **2014**, 20, 3606; *ACS Catal.* **2012**, 2, 163; *ACS Catal.* **2013**, 3, 1365; *ACS Catal.* **2013**, 3, 2195; *Org. Lett.* **2013**, 15, 4062; *Org. Lett.* **2016**, 18, 1143; *Adv. Synth. Catal.* **2015**, 357, 1149; *Adv. Synth. Catal.* **2013**, 355, 2029; *Adv. Synth. Catal.* **2012**, 354, 1646.
2. *Angew. Chem. Int. Ed.* **2016**, 55, 2939; *Chem. Sci.* **2013**, 4, 1281; *Chem. Commun.* **2016**, 52, 4761; *Chem. Commun.* **2015**, 51, 13508; *Chem. Commun.*, **2015**, 51, 7222; *Chem. Commun.* **2014**, 50, 2308; *Chem. Commun.* **2014**, 50, 7521; *Chem. Commun.* **2013**, 49, 5672; *Org. Lett.* **2014**, 16, 1768; *Chem. Eur. J.* **2013**, 19, 14039; *Adv. Synth. Catal.* **2015**, 357, 1277; *Adv. Synth. Catal.* **2015**, 357, 3057.