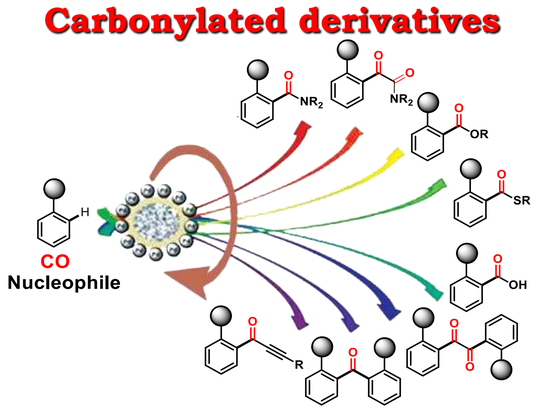
Catalytic *meta*-C-H Acylation of Arenes (METACYL-894026)

Vinayak Botla, Nicola Della Ca'

Department of Chemistry, Life Sciences an Environmental Sustainability– Plesso Chimico, Parco Area delle Scienze 17/A. I-43124 Parma, Italy
vinayak.botla@unipr.it, nicola.dellaca@unipr.it

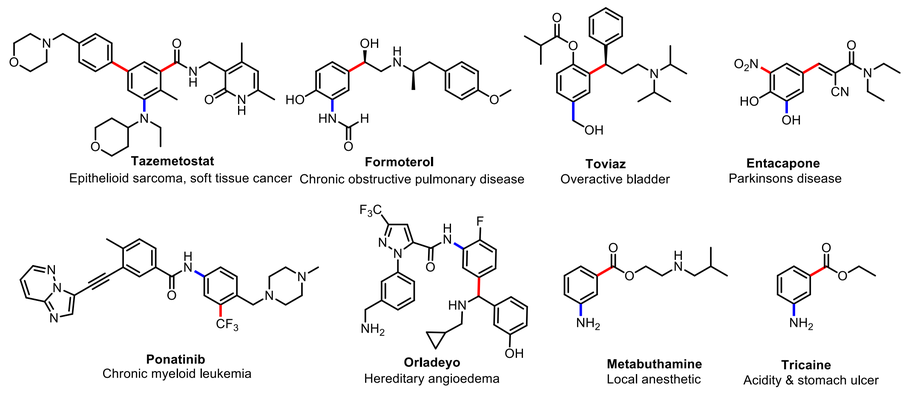
Carbonylated derivatives



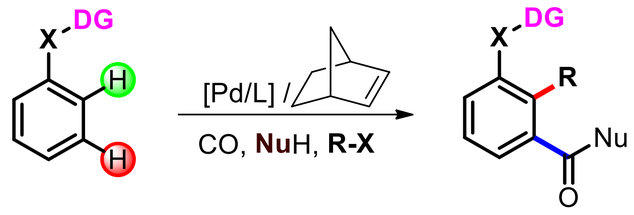
Aim of the project

The development of the first example of meta C-H acylation via mild carbonylation of arenes.
Pivoting on this breakthrough, it will be possible to accomplish synthetic methods
1) for the efficient synthesis of hardly accessible organic compounds,
2) for the activation and carbonylation of meta C(sp2)-H bonds
3) by employing transient directing group and
4) demonstrating the application of these protocols under continuous flow conditions.

meta-Functionalized arenes in APIs

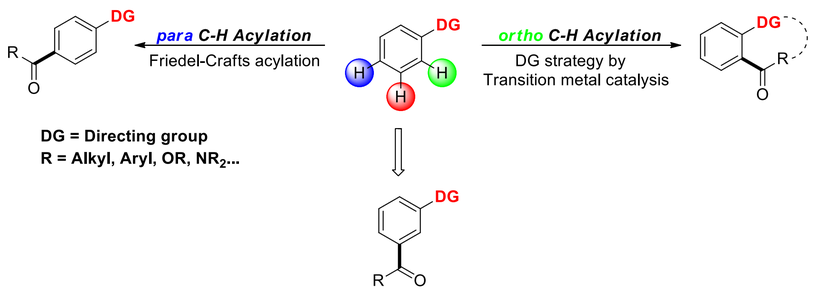


Pd-Catalyzed *meta* and *ortho*-C-H Activation of arenes

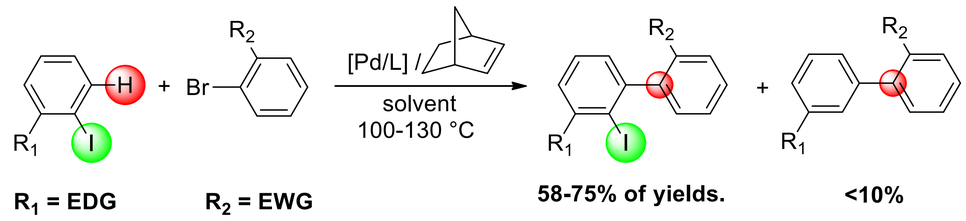


X = C, N & O, Nu = OR_1, NHR_1, **R-X** = teriminating agent

Rigioselectivity of arenes carbonylation



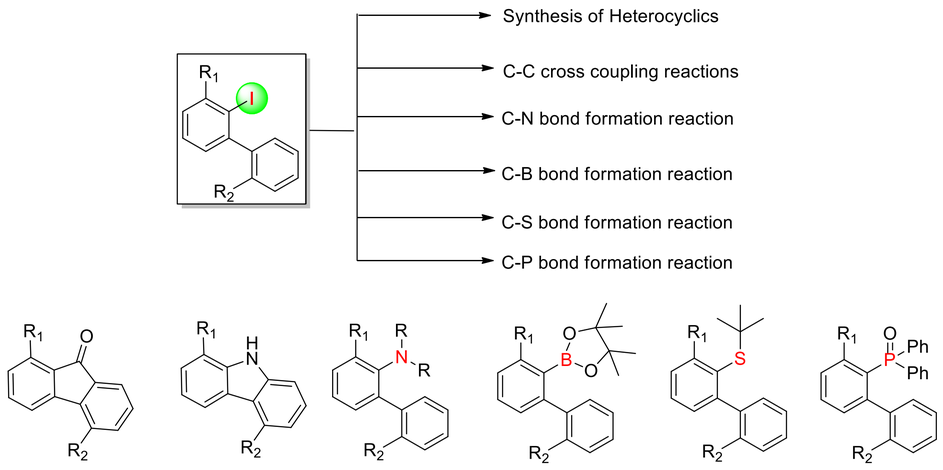
New Catellani-type approach to 2-iodobiaryls



Advantages of our protocol

- ✓ Good functional group tolerance
- ✓ Simple and readily available starting materials to form complex molecular structures
- ✓ Under relatively mild conditions
- ✓ In the one-pot process two new C–C (C–C and a C–I) bonds are selectively formed

Synthetic applications of 2-iodobiaryls



References

- J.-Q. Yu *et al., Nature* **2012**, *416*, 518−522.
- G. Dong *et al. Chem. Rev.* **2019**, *119*, 7478-7528
- N. Della Ca', M. Fontana, E. Motti, M. Catellani, *Acc. Chem. Res.* **2016**, *49*, 1389
- M. Lautens *et al.*, *Nat. Chem.*, **2015**, *7*, 863−870
- J.-Q. Yu *et al., Nature* **2015**, 519, 334−338
- J.-Q. Yu *et al., Angew. Chem. Int. Ed.,* **2017**, *56*, 5125 –5129
- G. Dong *et al.*, *J. Am. Chem. Soc*. **2015**, *137*, 5887–5890.