Axially Chiral Biaryl Atropisomers via a Pd–Catalyzed Atropo-enantioselective C–H Arylation

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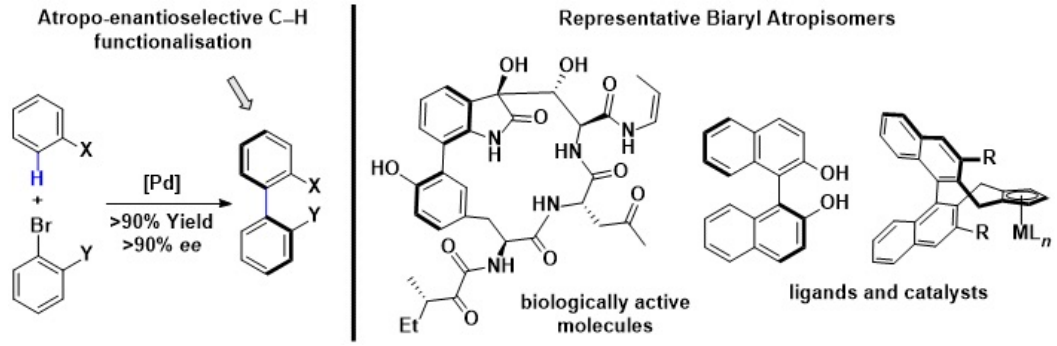
Most pharmaceuticals and agrochemicals, as well as many valuable material and commercial products are synthesized in organic chemistry laboratories, thus the development of new reactions, strategies, techniques, or improvements in reaction selectivity, efficiency and economy are of great importance. The development of new methods for the direct functionalization of unactivated C–H bonds is ushering in a paradigm shift in the field of retrosynthetic analysis. In particular, the catalytic enantioselective functionalization of C–H bonds represents a highly atom- and step-economic approach toward the generation of structural complexity. However, as a result of their ubiquity and low reactivity, controlling both the chemo- and stereoselectivity of such processes constitutes a significant challenge.[1]

The biaryl atropisomer motif is present in a number of biologically important molecules,[2] and acts as the stereochemical controlling element in many ligand scaffolds.[3] Herein we report the first highly atropo-enantioselective transition-metal catalyzed C−H arylation reaction. This demonstrates, for the first time, that biaryl axial chirality can be controlled in this setting.



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