**[Abstract]**

Axially chiral compounds (**轴手性化合物**) in which the chirality originates from highly sterically hindered rotation along a chiral axis rather than a stereogenic center with four different substituents have received much attention from chemists because of their widespread appearance in biologically active compounds and useful chiral ligands in asymmetric catalysis. Owing to the importance of this structural motif, the catalytic atroposelective construction of axially chiral scaffolds has been intensively investigated and great progress has been accomplished. However, the majority of methodologies in this field focused on the use of metal catalysis, whereas synthetic approaches involving organocatalysis have started to emerge only recently. We describe some advances from our group in organocatalytic atroposelective synthesis of axially chiral compounds involving the following strategies: enantioselective cross coupling of two aryl counterparts, asymmetric construction of an aromatic ring and kinetic resolution/desymmetrization and so on (Figure).

