Palladium-Catalyzed Enantioselective 1,2-Difunctionalization of 1,3-Dienes

Significance: The authors report a palladium-catalyzed enantioselective three-component coupling of 1,3-dienes with aryl iodides and sodium dialkylmalonates by using a H$_8$-BINOL-based phosphoramidite ligand. A series of chiral 1,2-difunctionalized products were prepared in good yields (≤93%) with high regio- and enantioselectivities (15:1 or better and ≤98% ee).

Comment: This reaction proceeds by a palladium-catalyzed cascade arylation and asymmetric allylic alkylation reaction, which provides an important alternative strategy for the enantioselective difunctionalization of 1,3-dienes, leading to synthetically useful chiral chemicals.

Selected examples:

- [Figure showing chemical structures and yields]