Copper-Catalyzed Asymmetric [4+1] Annulation of Sulfur Ylides

**Significance:** The authors report a copper-catalyzed asymmetric [4+1] cycloaddition by trapping copper–allenylidene dipolar intermediates with sulfur ylides. A variety of chiral indolines were obtained with high stereoselectivities (≤98% ee and dr > 95:5).

**Comment:** This reaction affords an opportunity for the ready synthesis of chiral indoline products and related cycloadducts with high stereoselectivities. Mechanistic studies suggest that this reaction is a sequential process that involves decarboxylative propargylation/\(S_{N}2\) reactions promoted by binuclear copper complexes.

**Selected examples:**

- 94% yield 95% ee
- 99% yield 94% ee
- 92% yield 98% ee
- 99% yield 95% ee

**Plausible mechanism:**