Asymmetric Vinylogous Mukaiyama–Michael Reaction via Iminium Catalysis

**Significance:** The authors report a highly enantio- and diastereoselective vinylogous Mukaiyama–Michael reaction of acyclic dienol silyl ethers to various enals by employing a Jørgensen–Hayashi catalyst. 1,7-Dicarbonyl compounds are obtained under mild reaction conditions with good to excellent yield and remarkable regioselectivity. 

**Comment:** Vinylogous Michael reactions of dienol derivatives can form a C–C bond with high regio- and stereoselectivity in the presence of a chiral catalyst. However, a catalytic enantioselective process of this reaction with acyclic nucleophiles and enals was elusive since the reaction can produce a number of regio- and stereoisomers. Herein, the catalyst nicely operates presumably by forming an iminium species with enal to induce 1,4-addition of nucleophile 2 with high γ-selectivity.

**Selected examples:**

- 74% yield, er = 99.5:0.5
- 72% yield, er = 99.5:0.5
- 90% yield, er > 99.5:0.5
- 50% yield, er = 85.5:14.5
- 77% yield, dr = 92.8 er = 99.5:0.5 from 3E2
- 65% yield, dr = 77:23 er = 98:2 from 3E2 in ethanol

**SYNFACTS Contributors:** Benjamin List, Ji-Woong Lee

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