Significance: A zirconium-catalyzed strategy for the asymmetric ring-opening of meso-ketene acetals through β-oxygen elimination is disclosed. The enantioenriched mono-vinylated cis-1,2-diols are furnished in good yields and enantioselectivities.

Comment: A stereochemical analysis of the observed enantioselectivity was performed using DFT calculations. Key steps are both the initial non-symmetry breaking hydrozirconation of the alkene and the asymmetric β-oxygen elimination.