The Catalytic Enantioselective Total Synthesis of (+)-Liphagal


**Significance:** (+)-Liphagal was isolated in 2006 from the Caribbean sponge Aka coralliphaga and belongs to a family of phosphatidylinositol 3-kinase (PI3K) inhibitors. Structurally, (+)-liphagal consists of an unprecedented [6-7-5-6] tetracyclic motif. Herein, the first catalytic enantioselective approach is reported.

**Comment:** This synthesis utilizes an enantioselective Tsuji-type allylation developed within the Stoltz group and a two-step oxidation–cyclization procedure to yield previously reported enone D with good enantioselectivity. Epimerization at C10 followed by cyclization enables hydrogenation of the trisubstituted olefin, yielding the trans-fused ring as the only product.