Total Synthesis of a Ladderane Phospholipid

**Significance:** Gonzalez-Martinez, Boxer, Burns and co-workers report an impressive total synthesis of a ladderane phospholipid based on strategic [2+2] cycloadditions of bicyclohexene B, which is obtained by means of a Ramberg–Bäcklund ring contraction of sulfoxide A.

**Comment:** Bicyclohexene B irradiated in the presence of CuOTf gave pentacycle F, which was subjected to an oxidative chlorination–elimination sequence to give cyclobutene I. Enantioselective hydroboration and four further steps yielded [5]-ladderanoic acid.

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1. NaH, E, DMF, 75 °C
2. AcCl, MeOH–CH2Cl2 (1:1)
3. EDC HCl, [5]-ladderanoic acid (R)-DM-SEGPHOS (11 mol%), B2pin2, t-BuONa, MeOH
4. DDQ, CH2Cl2, 0 °C
5. L, Me3N, PhMe, 0 °C to r.t.

**Key words**
- [2+2] cycloaddition
- [5]-ladderanoic acid
- [3]-ladderanol
- ladderane phospholipids
- Ramberg–Bäcklund reaction

**Category**
- Synthesis of Natural Products and Potential Drugs