Total Synthesis of (+)-Heilonine

**Significance:** (+)-Heilonine is a steroidal alkaloid that was isolated in 1989 from *Fritillaria ussuriensis*-Maxim. It is a member of the cevanine alkaloids, of which only one has been synthesized prior to this work. (+)-Heilonine consists of a hexacyclic framework, including a quinolizidine.

**Comment:** Ester D is accessed in enantiomerically enriched form via an asymmetric Diels–Alder reaction, and rapidly elaborated into ketone G. Ketone G was subjected to a Robinson annulation, yielding enone H. Lactam L, accessible via an Evans-aldol strategy, was alkylated with propargyl bromide K, giving triyne M. The key rhodium-catalyzed cyclotrimerization of M yielded arene N with the scaffold of the natural product. Few steps remained to access the natural product (+)-heilonine.