Significance: Yang and co-worker report the first and enantioselective total synthesis of mollane-type grayanoid (+)-mollanol A. The natural product has an unprecedented C-nor-D-homograyane carbon framework with an oxabicyclo[3.2.1]core. Comment: The total synthesis of (+)-mollanol A features a convergent strategy. Fragment E and L are connected in a Stille cross-coupling. Subsequent vinylogous aldol addition, followed by conjugate addition allows for a quick and efficient assembly of the entire carbon framework.