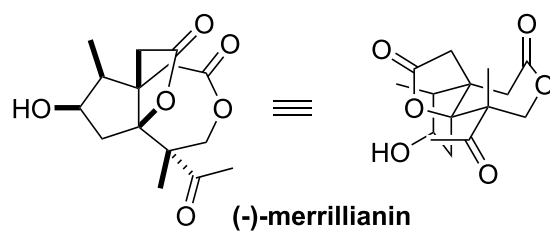


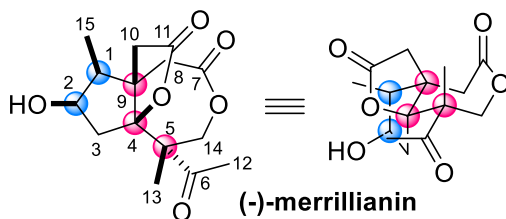
Problem Session (12)

2020/07/25 MASANORI NAGATOMO

Please propose your synthetic route to merrillianin from a commercial compound.



Synthetic Plan of (-)-Merrillianin



•**Isolation:** Isolated from the pericarps of *Illicium merrillianum* along with (6*R*)-pseudomajucin, (6*R*)-pseudomajucinone, (6*R*)-pseudomajucin, anisatin, anislactone B, cycloparvifloralone, 3α-hydroxycycloparvifloralone.

J.-M. Huang, C.-S. Yang, M. Kondo, K. Nakade, H. Takahashi, S. Takaoka, Y. Fukuyama. *Tetrahedron* **2002**, 58, 6937.

•**Bioactivities:** Merrillianin does not have neurotrophic nor toxic effects on rat cortical neurons at 1mM.

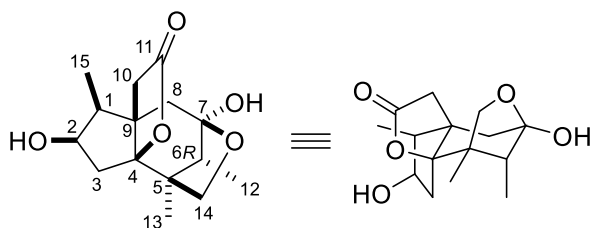
•**Structural features:** Sesquiterpene having an unusual chemical structure consisting of a cyclopentane fused to a five-membered ring lactone and a seven-membered ring lactone in the propeller form.

The absolute stereochemistry of (6*R*)-pseudomajucin was determined by the X-ray crystallographic analysis, but that of merrillianin has yet to be determined directly.

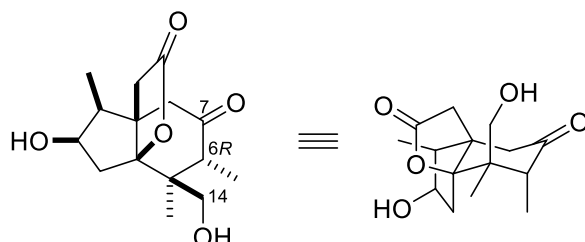
•Total synthesis

No report in peer-reviewed articles.

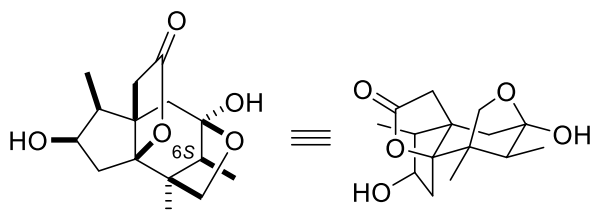
One total synthesis has been reported in a doctoral dissertation: Takashi Iizumi, Ph.D. Thesis, the Tokyo University of Science, 2012 (Shiina group).



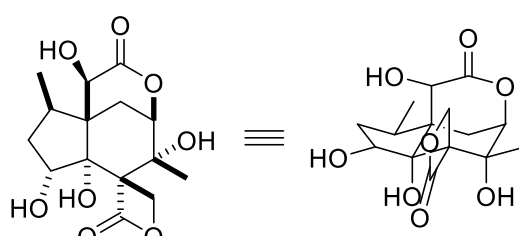
(6*R*)-pseudomajucin



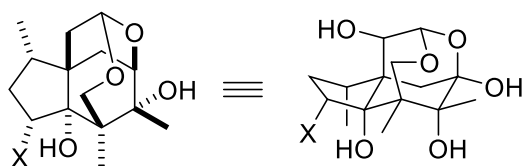
(6*R*)-pseudomajucinone



(6*S*)-pseudomajucin

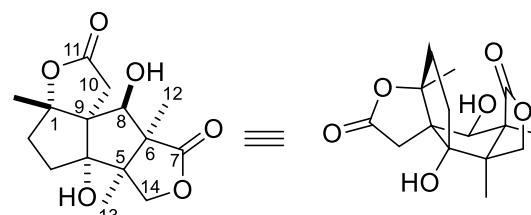


anisatin

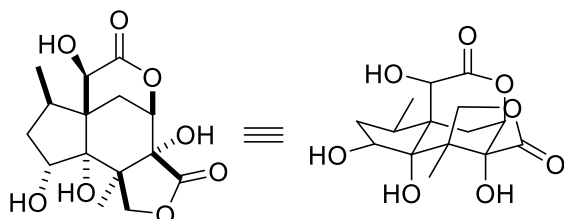


cycloparvifloralone: X = H

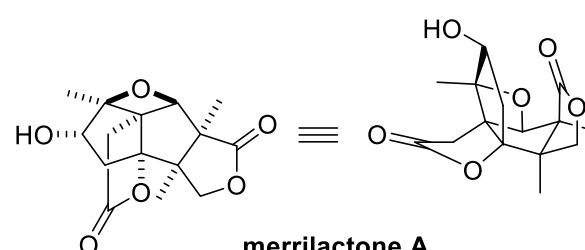
3α-cycloparvifloralone: X = OH



anislactone B



majucin



merrilactone A