# PRODUCT INFORMATION

## Micheliolide

*Item No. 25402*

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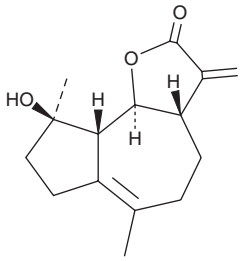
| **CAS Registry No.:** | 68370-47-8 |
| **Formal Name:** | 3aS,4,5,7,8,9R,9aS,9bS-octahydro-9-hydroxy-6,9-dimethyl-3-methylene-azuleno[4,5-b]furan-2(3H)-one |
| **MF:** | $C_{15}H_{20}O_3$ |
| **FW:** | 248.3 |
| **Purity:** | ≥98% |
| **Supplied as:** | A crystalline solid |
| **Storage:** | -20°C |
| **Stability:** | ≥4 years |
| **Item Origin:** | Plant/Costustoot |




*Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.*

### Laboratory Procedures

Micheliolide is supplied as a crystalline solid. A stock solution may be made by dissolving the micheliolide in the solvent of choice, which should be purged with an inert gas. Micheliolide is soluble in organic solvents such as ethanol, DMSO, and dimethyl formamide (DMF). The solubility of micheliolide in these solvents is approximately 1 mg/ml in ethanol and approximately 5 mg/ml in DMSO and DMF.

Micheliolide is sparingly soluble in aqueous buffers. For maximum solubility in aqueous buffers, micheliolide should first be dissolved in DMSO and then diluted with the aqueous buffer of choice. Micheliolide has a solubility of approximately 0.2 mg/ml in a 1:4 solution of DMSO:PBS (pH 7.2) using this method. We do not recommend storing the aqueous solution for more than one day.

### Description

Micheliolide is a sesquiterpene lactone and derivative of parthenolide (Item No. 70080) that has been found in *M. champaca* and has diverse biological activities.[1-4] It is an irreversible activator of the pyruvate kinase M2 isoform (PKM2; $EC_{50}$ = 6 nM) that decreases viability of HL-60 cells when used at concentrations ranging from 5 to 20 µM.[1] Micheliolide (5-10 µM) reduces *M. tuberculosis*-induced secretion of IL-1β and TNF-α, expression of *Cox2*, and production of nitric oxide (NO) in RAW 264.7 cells.[2] It also inhibits *M. tuberculosis*-induced NOD-, LRR-, and pyrin domain-containing protein 3 (NLRP3) inflammasome activation in RAW 264.7 cells. Micheliolide (30 mg/kg) decreases the severity of collagen-induced arthritis (CIA) in a mouse model of rheumatoid arthritis.[3] It also increases hepatic protein levels of PPARγ and reduces hepatic inflammation and steatosis in *db/db* mice.[4]

### References


1. Li, J., Li, S., Guo, J., *et al.* Natural product micheliolide (MCL) irreversibly activates pyruvate kinase M2 and suppresses leukemia. *J. Med. Chem.* **61(9)**, 4155-4164 (2018).
2. Zhang, Q., Jiang, X., He, W., *et al.* MCL plays an anti-inflammatory role in *Mycobacterium tuberculosis*-induced immune response by inhibiting NF-κB and NLRP3 inflammasome activation. *Mediators Inflamm.* 2432904 (2017).
3. Xu, H., Wang, J., Wang, C., *et al.* Therapeutic effects of micheliolide on a murine model of rheumatoid arthritis. *Mol. Med. Rep.* **11(1)**, 489-493 (2015).
4. Zhong, J., Gong, W., Chen, J., *et al.* Micheliolide alleviates hepatic steatosis in db/db mice by inhibiting inflammation and promoting autophagy via PPAR-γ-mediated NF-κB and AMPK/mTOR signaling. *Int. Immunopharmacol.* **59**, 197-208 (2018).





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