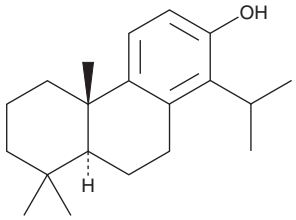
PRODUCT INFORMATION

Totarol

Item No. 26412

CAS Registry No.:	511-15-9
Formal Name:	(4bS,8aS)-4b,5,6,7,8,8a,9,10-octahydro-4b,8,8-trimethyl-1-(1-methylethyl)-2-phenanthrenol
Synonyms:	NSC 299936, (+)-Totarol, *trans*-Totarol
MF:	$C_{20}H_{30}O$
FW:	286.5
Purity:	≥98%
UV/Vis.:	λ_{max}: 281 nm
Supplied as:	A crystalline solid
Storage:	-20°C
Stability:	≥4 years
Item Origin:	Plant/*Podocarpus totara*



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

Laboratory Procedures

Totarol is supplied as a crystalline solid. A stock solution may be made by dissolving the totarol in the solvent of choice, which should be purged with an inert gas. Totarol is soluble in organic solvents such as ethanol, DMSO, and dimethyl formamide. The solubility of totarol in these solvents is approximately 2, 3, and 2.5 mg/ml, respectively.

Description

Totarol is a diterpene originally isolated from *P. totara* that has diverse biological activities, including antibacterial, antioxidant, and neuroprotective properties.[1] It is active against Gram-positive bacteria, including *P. acnes*, *S. mutans*, *B. subtilis*, and *B. ammoniagenes* (MICs = 0.39, 0.78, 1.56, and 0.78 µg/ml, respectively), as well as penicillin-resistant and -susceptible strains of *S. aureus* (MICs = 0.78 and 1.56 µg/ml, respectively).[2] It inhibits mitochondrial respiration in *P. aeruginosa*, inhibiting NADH-cytochrome c, NADH-DPIP, and NADH-coenzyme Q reductases but not cytochrome c oxidase.[3] Totarol inhibits Fe(III)-ADP/NADPH-induced lipid oxidation in rat liver microsomes and mitochondria (IC_{50}s = 4.79 and 0.47 µM, respectively) and autooxidation of linoleic acid (Item No. 90150) with an IC_{50} value of 9.8 µM.[4] In rat primary cerebellar granule cells, totarol increases Akt and GSK-3β phosphorylation when used at a concentration of 5 µM and prevents neuronal death induced by glutamate or oxygen and glucose deprivation.[5] It also reduces infarct volume in a rat model of acute cerebral ischemic injury when administered at doses of 1 and 10 microgram/kg.

References

1. Short, W.F. and Stromberg, H. Totarol. Part I. *J. Chem. Soc.* 516-520 (1937).
2. Kubo, I., Muroi, H., and Himehima, M. Antibacterial activity of totarol and its potentiation. *J. Nat. Prod.* **55(10)**, 1436-1440 (1992).
3. Haraguchi, H., Oike, S., Muroi, H., *et al.* Mode of antibacterial action of totarol, a diterpene from *Podocarpus nagi*. *Planta Med.* **62(2)**, 122-125 (1996).
4. Haraguchi, H., Ishikawa, H., and Kubo, I. Antioxidative action of diterpenoids from *Podocarpus nagi*. *Planta Med.* **63(3)**, 213-215 (1997).
5. Gao, Y., Xu, X., Chang, S., *et al.* Totarol prevents neuronal injury in vitro and ameliorates brain ischemic stroke: Potential roles of Akt activation and HO-1 induction. *Toxicol. Appl. Pharmacol.* **289(2)**, 142-154 (2015).

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