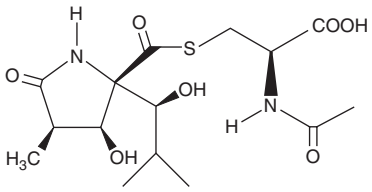
PRODUCT INFORMATION

Lactacystin

Item No. 70980

CAS Registry No.: 133343-34-7
Formal Name: 3S-hydroxy-2R-(1-hydroxy-2-methylpropyl)-4R-methyl-5-oxo-2-pyrrolidinecarboxylate-N-acetyl-L-cysteine
MF: $C_{15}H_{24}N_2O_7S$
FW: 376.4
Purity: ≥98%
Supplied as: A clear film
Storage: -20°C
Stability: As supplied, 2 years from the QC date provided on the Certificate of Analysis, when stored properly



Laboratory Procedures

Lactacystin is supplied as a clear film. A stock solution may be made by dissolving the lactacystin in an organic solvent purged with an inert gas. Lactacystin is soluble in organic solvents such as ethanol, DMSO, and dimethyl formamide (DMF). The solubility of lactacystin in ethanol is approximately1 mg/ml and 20 mg/ml in DMSO and DMF.

Further dilutions of the stock solution into aqueous buffers or isotonic saline should be made prior to performing biological experiments. Ensure that the residual amount of organic solvent is insignificant, since organic solvents may have physiological effects at low concentrations. Organic solvent-free aqueous solutions of lactacystin can be prepared by directly dissolving the crystalline compound in aqueous buffers. The solubility of lactacystin in PBS (pH 7.2) is approximately 2 mg/ml. We do not recommend storing the aqueous solution for more than one day.

Description

Lactacystin is a microbial metabolite isolated from Streptomyces that is now widely used as a selective inhibitor of the 20S proteasome.[1-3] Lactacystin was first characterized by its ability to induce differentiation and inhibit cell cycle progression in several tumor cell lines. At concentrations from 2 to 10 µM, lactacystin induces the outgrowth of neurites in the neuroblastoma cell line Neuro2a.[4] Lactacystin irreversibly alkylates subunit X of the 20S proteasome.[3] The concomitant inhibition of proteasome peptidase activity results in the accumulation of a variety of ubiquitinated proteins which would normally undergo rapid degradation. Thus, the effects of lactacystin are pleiotropic and depend substantially on the expression pattern of signalling proteins within the treated cell.

References

1. Omura, S., Fujimoto, T.T., Otoguro, K., *et al.* Lactacystin, a novel microbal metabolite, induces neuritogenesis of neuroblastoma cells, *J. Antibiotics* **44**, 113-116 (1991).
2. Corey, E.J. and Reichard, G.A. Total synthesis of lactacystin. *J. Am. Chem. Soc.* **114**, 10677-10678 (1992).
3. Fenteany, G. and Schreiber, S.L. Lactacystin, proteasome function, and cell fate. *J. Biol. Chem.* **273(15)**, 8545-8548 (1998).
4. Fenteany, G., Standaert, R.F., Reichard, G.A., *et al.* A β-lactone related to lactacystin induces neurite outgrowth in a neuroblastoma cell line and inhibits cell cycle progression in an osteosarcoma cell line. *Proc. Natl. Acad. Sci. USA* **91**, 3358-3362 (1994).

WARNING
THIS PRODUCT IS FOR RESEARCH ONLY - NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

SAFETY DATA
This material should be considered hazardous until further information becomes available. Do not ingest, inhale, get in eyes, on skin, or on clothing. Wash thoroughly after handling. Before use, the user must review the complete Safety Data Sheet, which has been sent *via* email to your institution.

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