

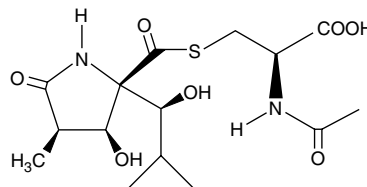
Product Information



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: $\geq 98\%$
Stability: ≥ 2 years at -20°C
Supplied as: A clear film



Laboratory Procedures

For long term storage, we suggest that lactacystin be stored as supplied at -20°C . It should be stable for at least two years.

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 approximately 1 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.

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 Neuro 2A.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

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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).

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