

PRODUCT INFORMATION



Clasto-Lactacystin β -lactone

Item No. 70988

CAS Registry No.: 154226-60-5

Formal Name: 1R-[1S-1hydroxy-2-methylpropyl]-
4R-methyl-6-oxa-2-azabicyclo[3.2.0]
heptane-3,7-dione

Synonyms: β -Clastolactacystin, Omuralide

MF: $C_{10}H_{15}NO_4$

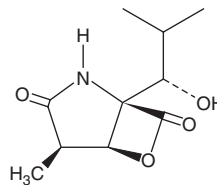
FW: 213.2

Purity: $\geq 95\%$

Supplied as: A solution in methyl acetate

Storage: $-20^{\circ}C$

Stability: As supplied, 2 years from the QC date provided on the Certificate of Analysis, when stored properly



Laboratory Procedures

Clasto-lactacystin β -lactone is supplied as a solution in methyl acetate. To change the solvent, simply evaporate the methyl acetate under a gentle stream of nitrogen and immediately add the solvent of choice. The solvent DMSO purged with an inert gas can be used. The solubility of clasto-lactacystin β -lactone in this solvent is approximately 25 mg/ml.

Description

Lactacystin is a microbial metabolite isolated from *Streptomyces* that is now widely used as a selective inhibitor of the 20S proteasome.¹⁻³ Clasto-lactacystin β -lactone was later identified as the active metabolite of lactacystin, resulting from the elimination of cysteine and the formation of a reactive β -lactone. Both lactacystin and its β -lactone metabolite induce differentiation and inhibit cell cycle progression in several tumor cell lines.⁴ Clasto-lactacystin β -lactone irreversibly alkylates subunit X of the 20S proteasome.³ It is at least 10 times more active than the parent compound; this increased activity may be a function of increased cell permeability. 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 clasto-lactacystin β -lactone are pleiotropic and depend substantially on the expression pattern of signaling proteins within the treated cell.

References

1. Omura, S., Fujimoto, T.T., Otoguro, K., *et al.* Lactacystin, a novel microbial 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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