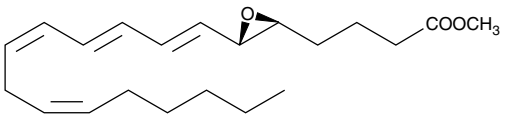
Product Information

Leukotriene A_4 methyl ester

Item No. 20010

CAS Registry No: 73466-12-3
Formal Name: 5S-*trans*-5,6-oxido-7E,9E,11Z,14Z-eicosatetraenoic acid, methyl ester
Synonym: LTA_4 methyl ester
MF: $C_{21}H_{32}O_3$
FW: 332.5
Purity: ≥97%
Stability: ≥1 year at -80°C
Supplied as: A solution in hexane/1% triethylamine
UV/Vis: λ_{max}: 279 nm ε: 49,000
Miscellaneous: Light Sensitive



Laboratory Procedures

For long term storage, we suggest that leukotriene A_4 methyl ester (LTA_4 methyl ester) be stored as supplied at -80°C. It should be stable for at least one year.

LTA_4 methyl ester is supplied as a solution in in hexane containing 1% triethylamine. The naturally occurring free acid of LTA_4 is too unstable for storage. The methyl ester is provided because of its increased stability. However, both the free acid and the methyl ester decompose rapidly under acidic conditions. Before performing any biological experiments, LTA_4 methyl ester should be hydrolyzed to LTA_4. Alkaline hydrolysis of LTA_4 methyl ester can be performed as follows:

> Prepare a hydrolysis solution consisting of degassed acetone (8 ml) and 0.25 M NaOH (2 ml) and cool it to 0°C. Evaporate the hexane solution of LTA_4 methyl ester just to dryness under nitrogen and immediately add 4 ml of the hydrolysis solution per 1 mg of LTA_4 methyl ester (e.g., 400 ml per 100 mg vial). Allow the reaction to stand under an inert atmosphere of nitrogen or argon at 22°C for 40 minutes. The resulting basic solution of LTA_4 will be stable for about 60 minutes at room temperature or for 12 hours at 0°C. Dilutions of this LTA_4 stock solution can be made directly into aqueous buffers. Incorporation of albumin in the buffers will increase the stability of LTA_4 in aqueous media.[1] Solutions not used within 12 hours of hydrolysis should be discarded.

LTA_4 is synthesized in mast cells, eosinophils, and neutrophils from arachidonic acid by 5-lipoxygenase, which exhibits both lipoxygenase and LTA_4 synthase activities.[2,3] LTA_4 is rapidly metabolized by LTA_4 hydrolase or LTC_4 synthase to LTB_4 or LTC_4, respectively.[3] LTA_4 from leukocytes is known to undergo transcellular metabolism in platelets, erythrocytes, and endothelial cells.[4] Further metabolism of LTA_4 by 15-lipoxygenase leads to lipoxin biosynthesis.[3] LTA_4 as a free acid is highly unstable. The methyl ester is stable and can be readily hydrolyzed to the free acid as needed.

References

1. Manganaro, F., Gaudette, Y., Pombo-Gentile, A., *et al.* Purification and characterization of leukotriene A_4 epoxide hydrolase from dog lung. *Prostaglandins* **36**, 859-874 (1988).
2. Shimizu, T., Rådmark, O., and Samuelsson, B. Enzyme with dual lipoxygenase activities catalyzes leukotriene A_4 synthesis from arachidonic acid. *Proc. Nat. Acad. Sci USA* **81**, 689-693 (1984).
3. Samuelsson, B., Dahlén, S.-E., Lindgren, J.Å., *et al.* Leukotrienes and lipoxins: Structures, biosynthesis, and biological effects. *Science* **237**, 1171-1176 (1987).
4. Maclouf, J.A. and Murphy, R.C. Transcellular metabolism of neutrophil-derived leukotriene A_4 by human platelets. A potential cellular source of leukotriene C_4. *J. Biol. Chem.* **263**, 174-181 (1988).

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