Product Data Sheet

Product Name: Ophthalmic acid TFA
Cat. No.: GC81579

Chemical Properties

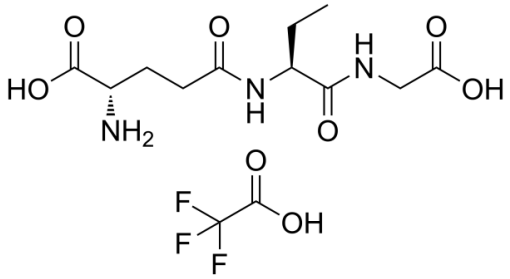
Cas. No.

Formula	$C_{13}H_{20}F_3N_3O_8$	M.Wt	403.31
Solubility	DMSO: 100 mg/mL (247.95 mM; Need ultrasonic)	Storage	Store at -20°C, away from moisture

General tips: For obtaining a higher solubility , please warm the tube at 37 °C and shake it in the ultrasonic bath for a while.Stock solution can be stored below -20°C for several months.

Shipping Condition: Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request.

Structure



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Background

Ophthalmic acid TFA is a ubiquitous metabolite and glutathione modulator, with a K i of 0.95 mM for glyoxalase I. Ophthalmic acid TFA competitively inhibits glyoxalase I, glutathione S-transferase, glutaredoxin, glutamate-cysteine ligase, protein disulfide reductase (glutathione), as well as non-selective cation channels. Ophthalmic acid TFA is applicable in diabetes-related research [1] [2].

In Vivo, Ophthalmic acid TFA increases liver Ophthalmic acid TFA levels >35-fold, elevates serum Ophthalmic acid TFA, and enhances adipose tissue glucose uptake, while leaving Ophthalmic acid TFA levels unchanged in other tissues in wild-type mice under dietary methionine restriction[1]. Ophthalmic acid TFA elevates liver Ophthalmic acid TFA levels 20-fold while depleting hepatic glutathione in Cystathionine β-synthase-deficient mice with genetic homocystinuria[1].

In Vitro, Ophthalmic acid (5 μM-millimolar concentrations) TFA exerts pleiotropic effects on GSH utilizing enzymes: it induces glutathione reductases, inhibits glutaredoxins (60% reduction at 5 μM) and millimolar-concentration exposed glutathione S-transferases, and does not affect glutathione peroxidases[1]. Ophthalmic acid TFA competitively inhibits the glyoxalase I reaction [1]. Ophthalmic acid TFA inhibits the activation of non-selective cation channels by intracellular NAD+ via mimicry of GSH's tripeptide structure[1]. Ophthalmic acid TFA competitively inhibits GSH uptake in yeast [1]. Ophthalmic acid TFA competitively inhibits purified glyoxalase I enzyme activity with an inhibitor equilibrium constant (Ki) of 0.95 mM[2].

References:

[1]. Schomakers BV, et al. Ophthalmic acid is a glutathione regulating tripeptide. FEBS J. 2024;291(15):3317-3330.
[2]. CLIFFE EE, et al. The mechanism of the glyoxalase I reaction, and the effect of ophthalmic acid as an inhibitor. Biochem J. 1961 Jun;79(3):475-82.

Caution: Product has not been fully validated for medical applications. For research use only.
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