

Product Data Sheet

Product Name: (±)-trans-ACPD

Cat. No.: GC12394

Chemical Properties

Cas. No. 67684-64-4

Chemical Name (1S,3R)-1-aminocyclopentane-1,3-dicarboxylic acid

SMILES OC([C@]1(C[C@H](C(O)=O)CC1)N)=O

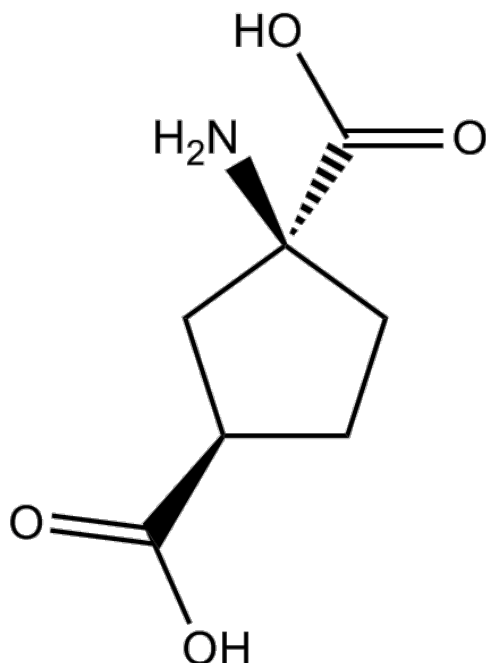
Formula $C_7H_{11}NO_4$ M.Wt 173.17

Solubility Soluble to 5 mM in sterile water and to 100 mM in 1eq. NaOH Storage Store at RT

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



Protocol

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

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**Animal
experiment:**

Mice[3]Male Swiss mice (25-35 g) are used. Intrathecal injections are given to fully conscious mice. Briefly, the animals are manually restrained, and a 30-gauge needle connected by a polyethylene tube to a 25 μ L Hamilton gas-tight syringe is inserted through the skin and between the vertebrae into the subdural space of the L5-L6 spinal segments. Intrathecal injections (5 μ L/site) are administered over a period of 5 s. Biting behaviour is defined as a single head movement directed at the flanks or hind limbs, resulting in contact of the animal's snout with the target organ. The nociceptive response is elicited by NMDA (450 pmol/site, a selective agonist of the NMDA glutamatergic ionotropic receptor), kainate (110 pmol/site, a selective agonist of the kainate subtype of glutamatergic ionotropic receptors), and trans-ACPD (50 nmol/site, a non-selective agonist of metabotropic glutamate receptors, which is active at group I and group II), TNF- α (0.1 pmol/site) and IL-1 β (1 pmol/site) or saline (5 μ L/site, i.t.). The amount of time the animal spent biting or licking the caudal region is taken as evidence of nociception and is evaluated following local post injections of the following agonists: NMDA (5 min), kainate (4 min), and trans-ACPD TNF- α , and IL-1 β (15 min). Animals received GM (100 mg/kg, i.p.) 0.5 h before intrathecal injection of 5 μ L of the drugs, while control animals received a similar volume of saline (10 mL/kg, i.p.).

References:

- [1]. Linden DJ, et al. Trans-ACPD, a metabotropic receptor agonist, produces calcium mobilization and an inward current in cultured cerebellar Purkinje neurons. J Neurophysiol. 1994 May;71(5):1992-8.
- [2]. Littman L, et al. Multiple mechanisms for inhibition of excitatory amino acid receptors coupled to phosphoinositide hydrolysis. J Neurochem. 1992 Nov;59(5):1893-904.
- [3]. Córdova MM, et al. Polysaccharide glucomannan isolated from Heterodermia obscurata attenuates acute and chronic pain in mice. Carbohydr Polym. 2013 Feb 15;92(2):2058-64.

Background

trans-ACPD, a metabotropic receptor agonist, produces calcium mobilization and an inward current

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in cultured cerebellar Purkinje neurons.

Excitatory amino acid (EAA) analogues activate receptors that are coupled to the increased hydrolysis of phosphoinositides (PIs). In these studies, hippocampal slices are prepared from neonatal rats (6-11 days old) to characterize the effects of EAA analogues on these receptors. The concentrations of trans-ACPD required to evoke half-maximal stimulation (EC₅₀ value) is 51 μ M. DL-2-Amino-3-phosphonopropionate (DL-AP3) is also equipotent as an inhibitor of PI hydrolysis stimulated by ibotenate, quisqualate, and trans-ACPD (IC₅₀ values are 480-850 μ M)[2].

Intrathecal injection of NMDA, kainate, and trans-ACPD, TNF- α , or IL-1 β causes significant ($p < 0.001$) biting behaviour in mice compared to animals injected intrathecally with saline. In all groups, systemic pre-treatment with GM (100 mg/kg, i.p.) significantly ($p < 0.001$) reduces the biting behaviour compared to mice treated with saline (10 mL/kg, i.p.). The greatest effect of GM is observed on the pro-inflammatory cytokines and NMDA, with the following inhibition percentages: TNF- α (92 $\pm$ 7%), IL-1 β (91 $\pm$ 5%), NMDA (69 $\pm$ 1%), and trans-ACPD (71 $\pm$ 12%). By contrast, at the same dose, GM has no significant effect on the kainate-mediated biting response[3].

Reference:

- [1]. Linden DJ, et al. Trans-ACPD, a metabotropic receptor agonist, produces calcium mobilization and an inward current in cultured cerebellar Purkinje neurons. J Neurophysiol. 1994 May;71(5):1992-8.
- [2]. Littman L, et al. Multiple mechanisms for inhibition of excitatory amino acid receptors coupled to phosphoinositide hydrolysis. J Neurochem. 1992 Nov;59(5):1893-904.
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