Iopanoic acid

Cat. No.: HY-B1664

CAS No.: 96-83-3

Molecular Formula: $C_{11}H_{12}I_3NO_2$

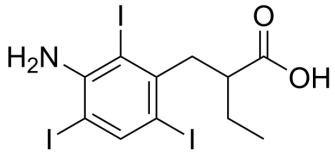
Molecular Weight: 570.93

Target: Others

Pathway: Others

Storage:

Powder	-20°C	3 years
	4°C	2 years
In solvent	-80°C	6 months
	-20°C	1 month



SOLVENT & SOLUBILITY

In Vitro

DMSO : 100 mg/mL (175.15 mM; Need ultrasonic)

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	1.7515 mL	8.7576 mL	17.5153 mL
5 mM	0.3503 mL	1.7515 mL	3.5031 mL
10 mM	0.1752 mL	0.8758 mL	1.7515 mL

Please refer to the solubility information to select the appropriate solvent.

In Vivo

1. Add each solvent one by one: 10% DMSO >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.5 mg/mL (4.38 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (4.38 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (4.38 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Iopanoic acid is an inhibitor of 5'-Deiodinase and also an iodinated contrast medium.

IC_{50} & Target

5'-Deiodinase[1]

In Vitro

The thyrotropin-releasing-hormone (TRH)-induced thyrotropin (TSH) release from the pituitary fragments is inhibited by 3,5,3'-triiodothyronin (T_3) (10^{-7} M), by triiodothyroacetic acid (10^{-7} to 10^{-7} M), and by high concentrations of iodide (10^{-4} or 10^{-5} M). Iopanoic acid has no significant effect at the concentrations tested[2].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

In Vivo

Iopanoic acid (IOP) administration to pregnant rats during days 18 and 19 postconception does not modify litter size (controls: 11.8±0.5 fetusesldam, Iopanoic acid-treated: 11.6±0.6 fetusesldam) or body weight at day 20 (controls: 3.27±0.12 g, Iopanoic acid-treated: 3.42±0.20 g). Iopanoic acid treatment produces a significant blockage of 5'-Deiodinase (5'D) activity in interscapular brown adipose tissue (IBAT) and brain; in contrast, liver 5'D is not modified. 3,5,3'-triiodothyronin (T_3) content is similar in IBAT and slightly increased in brain and liver nuclei of Iopanoic acid-treated fetuses when compare with control fetuses at day 20 ($p<0.05$). However, when administered to adult rats, Iopanoic acid produces a significant reduction in IBAT nuclear T_3 content and plasma T_3 concentration. Iopanoic acid inhibition of IBAT 5'D activity in fetuses at term is as effective as at day 20[1].

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PROTOCOL

Cell Assay [2]

Rat pituitary fragments are superfused by Medium-199. After a 90 min equilibration period, the superfusion is continued for 135 min with or without inclusion into the superfusion medium of 3,5,3'-triiodothyronin (T_3) 10^{-7} M, triiodothyroacetic acid (TRIAC) (stock solution 10^{-4} M in 20% methanol, final concentrations 10^{-8} to 10^{-6} M), Iopanoic acid (stock solution 10^{-3} M in 0.2 M NaOH, final concentrations 10^{-7} to 10^{-5} M), or potassium iodide 10^{-7} to 10^{-4} M. The superfusion is followed by a 6-min pulse of thyrotropin-releasing-hormone (TRH)[2].

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Animal Administration [1]

Wistar rats initially weighing 180 to 200 g are used. The administration of Iopanoic acid (IOP) is started at day 18 of gestation. Pregnant rats are injected subcutaneously with 10 mg of Iopanoic acid every 12 h, from day 18 of gestation to 12 h before they are killed on the morning of day 20 or 22 of gestation. Control animals receive the vehicle solution with identical timing. Iopanoic acid effectiveness in decreasing interscapular brown adipose tissue (IBAT) nuclear 3,5,3'-triiodothyronin (T_3) is assessed by Iopanoic acid (IOP) administration to adult male rats (220 to 250 g body weight) following the same dose and time schedule as in pregnant dams during two days. Caesarean sections are performed at 18 (only untreated animals), 20 and 22 days of gestation. Fetuses are killed by decapitation, and IBAT, brain, and liver are removed. Tissue samples are immediately frozen in liquid nitrogen with the exception of brown fat from several 22 day-old fetuses, which is directly homogenized in 0.25 M sucrose for mitochondria isolation[1].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

REFERENCES

[1]. Tuca A, et al. Inhibition of iodothyronine 5'-deiodinase by iopanoic acid does not block nuclear T3 accumulation during rat fetal development. Pediatr Res. 1994 Jan;35(1):91-5.

[2]. Szabolcs I, et al. Effects of triiodothyronine, triiodothyroacetic acid, iopanoic acid and iodide on the thyrotropin-releasing hormone-induced thyrotropin release from superfused rat pituitary fragments. Acta Endocrinol (Copenh). 1991 Oct;125(4):427-34.

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