Liothyronine sodium

Cat. No.: HY-A0070

CAS No.: 55-06-1

Molecular Formula: $C_{15}H_{11}I_3NNaO_4$

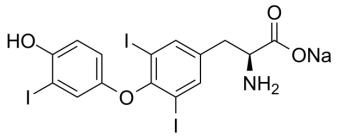
Molecular Weight: 673

Target: Thyroid Hormone Receptor; Endogenous Metabolite

Pathway: Vitamin D Related/Nuclear Receptor; Metabolic Enzyme/Protease

Storage: 4°C, sealed storage, away from moisture

* In solvent : -80°C, 6 months; -20°C, 1 month (sealed storage, away from moisture)



SOLVENT & SOLUBILITY

In Vitro

0.1 M NaOH : 12.5 mg/mL (18.57 mM; ultrasonic and adjust pH to 11 with NaOH)
DMSO : 5.56 mg/mL (8.26 mM; ultrasonic and warming and heat to 60°C)
H_2O : < 0.1 mg/mL (ultrasonic;warming;heat to 60°C) (insoluble)

Preparing Stock Solutions	Mass / Solvent / Concentration	1 mg	5 mg	10 mg
	1 mM	1.4859 mL	7.4294 mL	14.8588 mL
	5 mM	0.2972 mL	1.4859 mL	2.9718 mL
	10 mM	0.1486 mL	0.7429 mL	1.4859 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 (3.71 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (3.71 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (3.71 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Liothyronine sodium is an active form of thyroid hormone. Liothyronine sodium is a potent thyroid hormone receptors TRα and TRβ agonist with K_is of 2.33 nM for hTRα and hTRβ, respectively[1][2][3].

IC_{50} & Target

Human Endogenous Metabolite

In Vitro

Liothyronine (T3, 100 nM) sodium stimulates the proliferation of hepatocarcinema cells in which TRβ1 is overexpressed[1]. Liothyronine sodium binds to human β1 thyroid hormone receptor (hTRβ1), and changes its conformation. Liothyronine

sodium promotes growth, induces differentiation and regualtes metabolic effects[2].

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

PROTOCOL

Cell Assay [1]

Thyroid hormone depleted (Td) serum is prepared. The growth of hepatocarcinoma cells in methylcellulose is performed. To determine the effect of Liothyronine (T3) on the growth of cells, cells are plated at a density of 3×10^4 cells/60 mm dish on day 0, and incubated in medium containing 5% regular serum, 5% Td or 5% Td and 100 nM T3. The colony formation in methylcellulose is scored 3 weeks after initial plating[1].

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

CUSTOMER VALIDATION

- Cell Metab. 2023 Sep 7;S1550-4131(23)00304-2.
- Nat Commun. 2023 Jun 2;14(1):3208.
- JCI Insight. 2021 Jun 22;6(12):142838.
- J Med Chem. 2022 Jan 21.
- Food Science and Human Wellness. 2023 Nov;12(6);2061-2072.

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REFERENCES

[1]. Hiroaki Shiohara, et al. Discovery of novel indane derivatives as liver-selective thyroid hormone receptor β (TRβ) agonists for the treatment of dyslipidemia. Bioorg Med Chem. 2012 Jun 1;20(11):3622-34.

[2]. Lin KH, et al. Stimulation of proliferation by 3,3',5-triiodo-L-thyronine in poorly differentiated human hepatocarcinoma cells overexpressing beta 1 thyroid hormone receptor. Cancer Lett. 1994 Oct 14;85(2):189-94.

[3]. Bhat MK, et al. Conformational changes of human beta 1 thyroid hormone receptor induced by binding of 3,3',5-triiodo-L-thyronine. Biochem Biophys Res Commun. 1993 Aug 31;195(1):385-92.

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