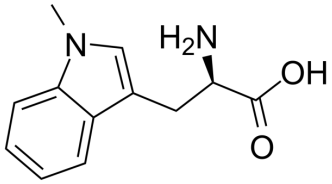
Indoximod

Cat. No.:	HY-16724
CAS No.:	110117-83-4
Molecular Formula:	$C_{12}H_{14}N_2O_2$
Molecular Weight:	218.25
Target:	Indoleamine 2,3-Dioxygenase (IDO)
Pathway:	Metabolic Enzyme/Protease
Storage:	Powder -20°C 3 years 4°C 2 years In solvent -80°C 2 years -20°C 1 year



SOLVENT & SOLUBILITY

In Vitro

H_2O : 5 mg/mL (22.91 mM; ultrasonic and adjust pH to 2 with HCl)
DMSO : 0.55 mg/mL (2.52 mM; Need ultrasonic and warming)

Preparing Stock Solutions

Mass / Solvent / Concentration	1 mg	5 mg	10 mg
1 mM	4.5819 mL	22.9095 mL	45.8190 mL
5 mM	0.9164 mL	4.5819 mL	9.1638 mL
10 mM	0.4582 mL	2.2910 mL	4.5819 mL

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

In Vivo

1. Add each solvent one by one: PBS
   Solubility: 1 mg/mL (4.58 mM); Clear solution; Need ultrasonic and warming and heat to 60°C

BIOLOGICAL ACTIVITY

Description

Indoximod (1-Methyl-D-tryptophan) is an orally active indoleamine 2,3-dioxygenase (IDO) pathway inhibitor. Indoximod acts as a Trp mimetic in regulating mTOR. Indoximod is an immunometabolic adjuvant used for the research of cancer[1][2].

IC_{50} & Target

IDO
19 μM (Ki)

In Vitro

The IDO inhibitor 1-methyl-tryptophan exists in two stereoisomers with potentially different biological properties. The L isomer is the more potent inhibitor of IDO activity using the purified enzyme and in HeLa cell–based assays. However, the D isomer is significantly more effective in reversing the suppression of T cells created by IDO-expressing dendritic cells. The L isomer of 1-methyl-tryptophan functioned as a competitive inhibitor (K_i=19 μM), whereas the d isomer is much less effective. The DL mixture is intermediate, with a K_i of 35 μM[1].

	MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	The D isomer is more efficacious as an anticancer agent in chemo-immunotherapy regimens using NSC-26271, NSC 125973, or LY 188011, when tested in mouse models of transplantable melanoma and transplantable and autochthonous breast cancer. The D isomer of 1-methyl-tryptophan specifically targets the IDO gene because the antitumor effect of d-1-methyl-tryptophan is completely lost in mice with a disruption of the IDO gene (IDO-knockout mice). Oral administration of dl-1-methyl-tryptophan in combination with NSC 125973 can elicit regression of autochthonous breast tumors[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Kinase Assay [1]	1MT enantiomers are solubilized in DMSO containing 0.1N HCl and added at concentrations of 100, 50, and 0 μM to wells containing the reaction mixture with tryptophan (0-200 μM) followed by addition of IDO enzyme. Plates are sealed and incubated 1 hr in a humidified 37°C incubator, after which the reactions are terminated by addition of 12.5 μl 30% TCA per well. Plates are then resealed in plastic wrap, incubated 30 min at 50°C to hydrolyze the reaction product N-formylkynurenine to kynurenine, and centrifuged. Supernatants are transferred to a flat-bottom 96-well plate, mixed with 100 μl Ehrlich reagent and incubated 10 min at room temperature. Absorbance at 490 nm is read[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Nat Biomed Eng. 2018 Aug;2(8):578-588.
- Bioact Mater. 6 (2021) 2158-2172.
- Biomaterials. 2023 Oct, 301, 122236.
- Adv Healthc Mater. 2022 May 16;e2102770.
- J Reprod Immunol. 23 August 2021, 103364.

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REFERENCES

[1]. Hou DY, et al. Inhibition of indoleamine 2,3-dioxygenase in dendritic cells by stereoisomers of 1-methyl-tryptophancorrelates with antitumor responses. Cancer Res. 2007 Jan 15;67(2):792-801.

[2]. Metz R, et al. IDO inhibits a tryptophan sufficiency signal that stimulates mTOR: A novel IDO effector pathway targeted by D-1-methyl-tryptophan. Oncoimmunology. 2012;1(9):1460-1468.

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

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