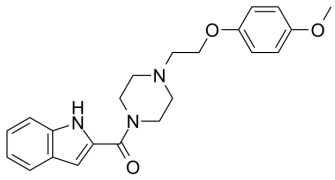
ML417

Cat. No.:	HY-136390
CAS No.:	1386162-69-1
Molecular Formula:	$C_{22}H_{25}N_3O_3$
Molecular Weight:	379.45
Target:	Dopamine Receptor
Pathway:	GPCR/G Protein; Neuronal Signaling
Storage:	Powder -20°C 3 years 4°C 2 years In solvent -80°C 2 years -20°C 1 year



SOLVENT & SOLUBILITY

In Vitro

DMSO : 50 mg/mL (131.77 mM; Need ultrasonic)

Preparing Stock Solutions	Solvent / Mass / Concentration	1 mg	5 mg	10 mg
	1 mM	2.6354 mL	13.1770 mL	26.3539 mL
	5 mM	0.5271 mL	2.6354 mL	5.2708 mL
	10 mM	0.2635 mL	1.3177 mL	2.6354 mL

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

In Vivo

1. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 5 mg/mL (13.18 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

ML417 is a selective and brain penetrant D3 dopamine receptor (D3R) agonist, with an EC_{50} of 38 nM. ML417 potently promotes D3R-mediated β-arrestin translocation, G protein mediated signaling, and pERK phosphorylation with minimal effects on other GPCR-mediated signaling. ML417 exhibits neuroprotection against toxin-induced neurodegeneration of dopaminergic neurons[1].

IC_{50} & Target

D_3 Receptor
38 nM (EC50)

In Vitro

ML417 exhibits a K_i for the D3R of 1.24 μM. ML417 is a full and potent agonist for multiple signaling pathways associated with D3R activation[1].
ML417 potently inhibits cAMP accumulation with an EC_{50} of 86 nM and an efficacy identical to that of dopamine. ML417 exhibits submicromolar affinity for only three of the targets, the β1-adrenergic, 5-HT2B serotoninergic, and σ-1 receptors.

	ML417 stimulates β-arrestin recruitment to the D3R-WT with an EC_{50} of 1.4 nM[1]. ML417 protects (0.005-5 μM; 24 hours) D3R-expressing dopaminergic neurons from 6-OHDA induced cell death[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	In vivo pharmacokinetics experiments in mice (using 20 mg/kg; i.p.) reveals that ML417 is brain penetrant and exhibits a plasma half-life of 3.44 hours and a brain half-life of 4.23 hours. ML417 displays a plasma T_{max} of 0.5 hours and C_{max} of 6500 ng/ml, and a brain T_{max} of 0.25 hours and C_{max} of 28000 ng/ml[1]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	6-8 week old male C57BL/6 mice[1]
Dosage:	20 mg/kg
Administration:	I.p. (Pharmacokinetic Analysis)
Result:	Brain penetrant and exhibits a plasma half-life of 3.44 hours and a brain half-life of 4.23 hours. Displayed a plasma T_{max} of 0.5 hours and C_{max} of 6500 ng/ml, and a brain T_{max} of 0.25 hours and C_{max} of 28000 ng/ml.

REFERENCES

[1]. Moritz AE, et al. Discovery, Optimization, and Characterization of ML417: A Novel and Highly Selective D3 Dopamine Receptor Agonist. J Med Chem. 2020;63(10):5526-5567.

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

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