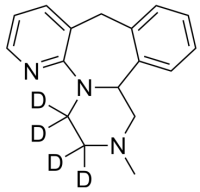
Mirtazapine-d_4 hydrochloride

Cat. No.:	HY-B0352S3
CAS No.:	1215587-73-7
Molecular Formula:	$C_{17}H_{16}D_4ClN_3$
Molecular Weight:	305.84
Target:	5-HT Receptor; Histamine Receptor; Adrenergic Receptor; Isotope-Labeled Compounds
Pathway:	GPCR/G Protein; Neuronal Signaling; Immunology/Inflammation; Others
Storage:	Please store the product under the recommended conditions in the Certificate of Analysis.



BIOLOGICAL ACTIVITY

Description	Mirtazapine-d_4 hydrochloride is deuterated labeled Mirtazapine (HY-B0352). Mirtazapine (Org3770) is a potent and orally active noradrenergic and specific serotonergic antidepressant (NaSSA) agent. Mirtazapine is also a 5-HT_2, 5-HT_3, histamine H1 receptor and α2-adrenoceptor antagonist with pK_i values of 8.05, 8.1, 9.3 and 6.95, respectively[1][2].
In Vitro	Stable heavy isotopes of hydrogen, carbon, and other elements have been incorporated into drug molecules, largely as tracers for quantitation during the drug development process. Deuteration has gained attention because of its potential to affect the pharmacokinetic and metabolic profiles of drugs[1]. Mirtazapine can antagonize the adrenergic α2-autoreceptors and α2-heteroreceptors as well as block 5-HT_2 and 5-HT_3 receptors. Mirtazapine enhances the release of norepinephrine and 5-HT1A-mediated serotonergic transmission[2]. The cytochrome (CYP) P450 isoenzymes CYP1A2, CYP2D6, and CYP3A4 are mainly responsible for Mirtazapine's metabolism [2]. Mirtazapine (10 μM) significantly reduces activation-induced release of cytokine/chemokine mediators from human $CD14^+$ monocytes in vitro[4]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Mirtazapine (1-20 mg/kg; intraperitoneal injection; once; C57BL/6 mice) treatment strikingly and dose-dependently inhibits Con A-induced liver injury[4]. Mirtazapine treatment inhibits hepatic macrophage/monocyte activation, decreases hepatic macrophage/monocyte-derived pro-inflammatory cytokine (e.g., TNFα) and chemokine (e.g., CXCL1 and CXCL2) production, suppression of Con A-induced increases in the hepatic expression of the neutrophil relevant endothelial cell adhesion molecule ICAM-1, with the resultant significant reduction in neutrophil recruitment into the liver[4]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

REFERENCES

[1]. S A Anttila, et al. A review of the pharmacological and clinical profile of mirtazapine. CNS Drug Rev. Fall 2001;7(3):249-64.

[2]. T H de Boer, et al. Neurochemical and autonomic pharmacological profiles of the 6-aza-analogue of mianserin, Org 3770 and its enantiomers. Neuropharmacology. 1988 Apr;27(4):399-408.

[3]. Wagdi Almishri, et al. The Antidepressant Mirtazapine Inhibits Hepatic Innate Immune Networks to Attenuate Immune-Mediated Liver Injury in Mice. Front Immunol. 2019 Apr 12;10:803.

[4]. Russak EM, et al. Impact of Deuterium Substitution on the Pharmacokinetics of Pharmaceuticals. Ann Pharmacother. 2019 Feb;53(2):211-216.

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

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