# Medetomidine hydrochloride

**Cat. No.:** HY-17034B

**CAS No.:** 86347-15-1

**Molecular Formula:** $C_{13}H_{17}ClN_2$

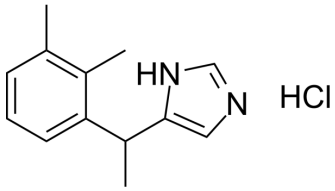
**Molecular Weight:** 236.74

**Target:** Adrenergic Receptor

**Pathway:** GPCR/G Protein; Neuronal Signaling

**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**

DMSO : 100 mg/mL (422.40 mM; Need ultrasonic)

Ethanol : 100 mg/mL (422.40 mM; Need ultrasonic)

$H_2O$ : ≥ 50 mg/mL (211.20 mM)

* "≥" means soluble, but saturation unknown.

**Preparing Stock Solutions**

| Mass / Solvent / Concentration | 1 mg | 5 mg | 10 mg |
|---|---|---|---|
| 1 mM | 4.2240 mL | 21.1202 mL | 42.2404 mL |
| 5 mM | 0.8448 mL | 4.2240 mL | 8.4481 mL |
| 10 mM | 0.4224 mL | 2.1120 mL | 4.2240 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 (10.56 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (10.56 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (10.56 mM); Clear solution
4. Add each solvent one by one: 10% EtOH >> 40% PEG300 >> 5% Tween-80 >> 45% saline
   Solubility: ≥ 2.5 mg/mL (10.56 mM); Clear solution
5. Add each solvent one by one: 10% EtOH >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (10.56 mM); Clear solution

## BIOLOGICAL ACTIVITY

**Description**

Medetomidine hydrochloride is an orally active α2-adrenoceptor agonist ($K_i$: 1.08 nM). Medetomidine hydrochloride has

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| | sedative and analgesic effects. Medetomidine hydrochloride can cause peripheral vasoconstriction through the activation of α2 adrenoceptors on blood vessels[1][2][3][4]. |
| **$IC_{50}$ & Target** | α2-adrenergic receptor<br>1.08 nM (Ki)<br><br>α1-adrenergic receptor<br>1750 nM (Ki) |
| **In Vitro** | Medetomidine (0-1 μM, 1 h) hydrochloride inhibits aldosterone release from the adrenocortical cell suspension[7].<br>Medetomidine (10 nM) hydrochloride activates a kicking response in Cyprids[8].<br>Medetomidine (1 μM) hydrochloride increases cellular cAMP production by activating β-like receptors in CHO cells[8].<br>MCE has not independently confirmed the accuracy of these methods. They are for reference only. |
| **In Vivo** | Medetomidine (200 μg/kg, p.o. or i.m.) hydrochloride induces a sedation in cats[4].<br>Medetomidine (20 μg/kg, i.v.) hydrochloride shows sedative and analgesic effects in dogs[5].<br>Medetomidine (0.05-0.3 mg/kg, s.c.) hydrochloride protects against Diazinon-induced toxicosis in mice[6].<br>MCE has not independently confirmed the accuracy of these methods. They are for reference only. |

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| Animal Model: | Diazinon (75 mg/kg, orally)-induced toxicosis in mice[6] |
| Dosage: | 0.05, 0.1 and 0.3 mg/kg |
| Administration: | Subcutaneous injection (s.c.), 15 min before Diazinon. |
| Result: | Protected the mice from the toxicity induced by Diazinon.<br>Decreased the occurrence of Straub tail, excessive salivation and tremor.<br>Increased the latencies to onset of tremor and death when compared with control. |

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| Animal Model: | Dogs[5] |
| Dosage: | 20 μg/kg |
| Administration: | Intravenous injection (i.v.) |
| Result: | Showed sedative and analgesic effects.Increased in SAP, MAP, DAP, MPAP, PCWP, CVP, SVR, PVR, core body temperature.<br>Decreased in HR, CO, CI, SV, SI, RR, pH. |

## REFERENCES


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

[2]. Kallio A, et al. Acute effects of medetomidine, a selective alpha 2-adrenoceptor agonist, on anterior pituitary hormone and cortisol secretion in man. Acta Endocrinol (Copenh). 1988 Sep;119(1):11-5.

[3]. R Virtanen, et al. Characterization of the selectivity, specificity and potency of medetomidine as an a2-adrenoceptor agonist.

[4]. O. B. Ansah, et al. Comparing oral and intramuscular administration of medetomidine in cats.

[5]. Kuo WC, et al. Comparative cardiovascular, analgesic, and sedative effects of medetomidine, medetomidine-hydromorphone, and medetomidine-butorphanol in dogs. Am J Vet Res. 2004 Jul;65(7):931-7.

[6]. Yakoub LK, et al. Medetomidine protection against diazinon-induced toxicosis in mice. Toxicol Lett. 1997 Sep 19;93(1):1-8.

[7]. Jager LP, et al. Effects of atipamezole, detomidine and medetomidine on release of steroid hormones by porcine adrenocortical cells in vitro. Eur J Pharmacol. 1998 Apr 3;346(1):71-6.

[8]. Ulrika Lind, et al. Octopamine receptors from the barnacle balanus improvisus are activated by the alpha2-adrenoceptor agonist medetomidine.



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