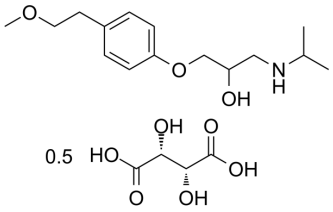
Metoprolol tartrate

Cat. No.:	HY-17503B
CAS No.:	56392-17-7
Molecular Formula:	$C_{19}H_{31}NO_9$
Molecular Weight:	342.41
Target:	Adrenergic Receptor; Apoptosis
Pathway:	GPCR/G Protein; Neuronal Signaling; Apoptosis
Storage:	Please store the product under the recommended conditions in the Certificate of Analysis.



BIOLOGICAL ACTIVITY

Description	Metoprolol tartrate is an orally active, selective β1-adrenoceptor antagonist. Metoprolol tartrate shows anti-inflammation, antitumor and anti-angiogenic properties[1][2][3].
IC_{50} & Target	β1 adrenoceptor

In Vitro

Metoprolol (0-1000 μg/mL; 24-72 h) shows cytotoxic effect on U937 and MOLT-4 cells dose and time dependently[3].

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

Cell Cytotoxicity Assay[3]

Cell Line:	U937 and MOLT-4 cells
Concentration:	1, 10, 50, 100, 500 and 1000 μg/mL
Incubation Time:	24, 48 and 72 h
Result:	Significantly decreased the viability of U937 and MOLT-4 cells at 1000 μg/mL (3740.14μM) concentration after 48 hours incubation time, significantly reduced the viability of U937 cells at ≥500 μg/ml (≥1870.07μM) concentrations after 72 hours incubation time, and significantly decreased the viability of MOLT4 cells at ≥100 μg/ml (≥374.01μM) concentrations after 72 hours incubation.

In Vivo

Metoprolol (2.5 mg/kg/h; infusion; 11 weeks) reduces proinflammatory cytokines and atherosclerosis in ApoE$^{-/-}$ Mice[1].

Metoprolol (15 mg/kg/q12h; i.g.; 5 days) shows anti-inflammation and anti-virus effects in murine model with coxsackievirus B3-induced viral myocarditis[2].

Metoprolol (2.5 mg/kg; i.v.; 3 bolus injections) significantly decreased activated caspase-9 protein expression and inhibits myocardial apoptosis in coronary microembolization (CME) rats[4].

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

Animal Model:	Male ApoE$^{-/-}$ mice[1]
Dosage:	2.5 mg/kg/h
Administration:	Via osmotic minipumps, 11 weeks

Result:	Significantly reduced atherosclerotic plaque area in thoracic aorta, reduced serum TNFα and the chemokine CXCL1 as well as decreasing the macrophage content in the plaques.

Animal Model:	Balb/c mice, coxsackievirus B3 (CVB3) induced viral myocarditis (VMC) model[2]
Dosage:	15 mg/kg/q12h
Administration:	Oral gavage, 5 consecutive days
Result:	Reduced pathological scores of VMC induced by CVB3 infection, protected the myocardium against viral damage by reducing serum cTn-I levels. Decreased the levels of myocardial pro-inflammatory cytokines and increase the expression of anti-inflammatory cytokine. Significantly decreased myocardial virus titers.

CUSTOMER VALIDATION

- Chemosphere. 2019 Jun;225:378-387.
- J Pharmaceut Biomed. 2020, 113870.
- J Pharmacol Sci. 2020 Sep;144(1):30-42.

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REFERENCES

[1]. Ulleryd MA, et al. Metoprolol reduces proinflammatory cytokines and atherosclerosis in ApoE-/- mice. Biomed Res Int. 2014;2014:548783.

[2]. Wang D, et al. Carvedilol has stronger anti-inflammation and anti-virus effects than metoprolol in murine model with coxsackievirus B3-induced viral myocarditis. Gene. 2014 Sep 1;547(2):195-201.

[3]. Hajatbeigi B, et al. Cytotoxicity of Metoprolol on Leukemic Cells in Vitro. IJBC 2018; 10(4): 124-129.

[4]. Su Q, et al. Effect of metoprolol on myocardial apoptosis and caspase-9 activation after coronary microembolization in rats. Exp Clin Cardiol. 2013 Spring;18(2):161-5.

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