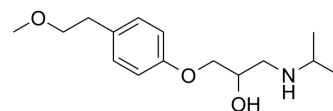


Metoprolol

Cat. No.: HY-17503
CAS No.: 51384-51-1
Molecular Formula: C₁₅H₂₅NO₃
Molecular Weight: 267.36
Target: Adrenergic Receptor; Apoptosis
Pathway: GPCR/G Protein; Neuronal Signaling; Apoptosis
Storage: 4°C, protect from light
 * In solvent : -80°C, 6 months; -20°C, 1 month (protect from light)



SOLVENT & SOLUBILITY

| | | | | | | |
|---|--|---|-----------|------------|------------|-------|
| In Vitro | DMSO : 100 mg/mL (374.03 mM; Need ultrasonic) | | | | | |
| | Preparing Stock Solutions | <div><div>Solvent</div><div>Concentration</div></div> | Mass | 1 mg | 5 mg | 10 mg |
| | | | | | | |
| | | 1 mM | 3.7403 mL | 18.7014 mL | 37.4028 mL | |
| | | 5 mM | 0.7481 mL | 3.7403 mL | 7.4806 mL | |
| | | 10 mM | 0.3740 mL | 1.8701 mL | 3.7403 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 (9.35 mM); Clear solution | | | | | |
| | 2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline) Solubility: ≥ 2.5 mg/mL (9.35 mM); Clear solution | | | | | |

BIOLOGICAL ACTIVITY

| | | |
|---------------------------|--|-----------------------|
| Description | Metoprolol is an orally active, selective β ₁ -adrenoceptor antagonist. Metoprolol shows anti-inflammation, antitumor and anti-angiogenic properties ^{[1][2][3]} . | |
| IC ₅₀ & Target | β ₁ 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.
- Clin Pharmacol Ther. 2023 Nov 16.
- J Pharmacol Sci. 2020 Sep;144(1):30-42.
- J Pharmaceut Biomed. 2020, 113870.
- J Chromatogr B. 2023 Jun 20, 123804.

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REFERENCES

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

Tel: 609-228-6898

Fax: 609-228-5909

E-mail: tech@MedChemExpress.com

Address: 1 Deer Park Dr, Suite Q, Monmouth Junction, NJ 08852, USA