Norepinephrine

Cat. No.: HY-13715

CAS No.: 51-41-2

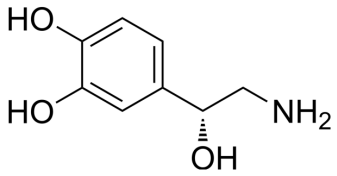
Molecular Formula: $C_8H_{11}NO_3$

Molecular Weight: 169.18

Target: Endogenous Metabolite; Adrenergic Receptor; Autophagy

Pathway: Metabolic Enzyme/Protease; GPCR/G Protein; Neuronal Signaling; Autophagy

Storage: 4°C, protect from light, stored under nitrogen
* In solvent : -80°C, 6 months; -20°C, 1 month (protect from light, stored under nitrogen)



SOLVENT & SOLUBILITY

In Vitro

DMSO : 50 mg/mL (295.54 mM; ultrasonic and adjust pH to 2 with HCl)
H_2O : < 0.1 mg/mL (insoluble)

Preparing Stock Solutions

Solvent / Mass / Concentration	1 mg	5 mg	10 mg
1 mM	5.9109 mL	29.5543 mL	59.1086 mL
5 mM	1.1822 mL	5.9109 mL	11.8217 mL
10 mM	0.5911 mL	2.9554 mL	5.9109 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: ≥ 2.08 mg/mL (12.29 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.08 mg/mL (12.29 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.08 mg/mL (12.29 mM); Clear solution

BIOLOGICAL ACTIVITY

Description

Norepinephrine (Levarterenol; L-Noradrenaline) is a potent adrenergic receptor (AR) agonist. Norepinephrine activates α_1, α_2, β_1 receptors[1][2][3][4].

IC_{50} & Target

α1-adrenergic receptor	α2-adrenergic receptor	Beta-1 adrenergic receptor	Microbial Metabolite
Human Endogenous Metabolite			

In Vitro	Norepinephrine (NE) is generally considered to be a β_1-subtype selective adrenergic agonist over β_2-adrenoceptor. Norepinephrine(NE) also has direct activity at the β_2-adrenoceptor in higher concentrations[1]. Adipocytes from the inguinal fat pad (iWA) or the interscapular fat pad (BA) are isolated from neonatal wild-type C57BL/6J mice and cultured. To examine the effect of activating AT2 upon β-adrenergic signaling, cAMP production is first assessed in response to Norepinephrine (NE, 10 μM) with or without CGP (10 nM) co-treatment. Norepinephrine (NE) increases cAMP as expected in iWA, and CGP does not alter this effect Norepinephrine (NE) is also known to induce lipolysis, and liberated fatty acids are required to functionally activate UCP1 protein and to stimulate heat production. CREB phosphorylation at Ser133 is increased after Norepinephrine (NE) treatment and significantly attenuated with CGP co-treatment in mouse iWA[3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	Norepinephrine can be used in animal modeling to construct animal cardiomyopathy models. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Cell Assay [2]	Subcutaneous preadipocytes derived from a 38-year old non-diabetic female donor are immortalized with TERT and HPV E6/E7. For the current studies, a stable diploid clone (referred to as clone B) with consistent differentiation capacity is isolated by ring cloning. Cells are grown in preadipocyte PGM2 media. Once cells are confluent, differentiation is induced by incubation in differentiation media consisting of dexamethasone, IBMX, indomethacin, and additional insulin. Cells are differentiated for 10 days. Prior to treatment, media is replaced with PGM2 media for one day and then switched to serum-free media overnight for treatments. Adipocytes are treated for 6 hours with vehicle, Norepinephrine (NE, 10 μM), CGP (10 nM), or Norepinephrine (NE) and CGP[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Cell Mol Immunol. 2023 Jan 5.
- ACS Nano. 2022 Aug 23;16(8):12553-12568.
- Nat Commun. 2022 Jul 25;13(1):4278.
- Cell Rep Med. 2023 May 24;101061.
- Theranostics. 2022 Jun 6;12(10):4718-4733.

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REFERENCES

[1]. MacGregor DA, et al. Relative efficacy and potency of beta-adrenoceptor agonists for generating cAMP in human lymphocytes. Chest. 1996 Jan;109(1):194-200.

[2]. Littlejohn NK, et al. Suppression of Resting Metabolism by the Angiotensin AT2 Receptor. Cell Rep. 2016 Aug 9;16(6):1548-60.

[3]. Brian P Ramos, et al. Adrenergic pharmacology and cognition: focus on the prefrontal cortex. Pharmacol Ther. 2007 Mar;113(3):523-36.

[4]. Xinyu Xu, et al. Binding pathway determines norepinephrine selectivity for the human β 1 AR over β 2 AR. Cell Res. 2021 May;31(5):569-579.

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

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