DAMGO

Cat. No.: HY-P0210

CAS No.: 78123-71-4

Molecular Formula: $C_{26}H_{35}N_5O_6$

Molecular Weight: 513.59

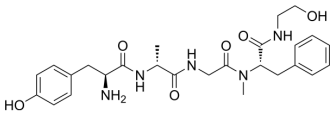
Sequence: Tyr-{d-Ala}-Gly-{Me-Phe}-Gly-ol

Sequence Shortening: Y-{d-Ala}-G-{Me-Phe}-G-ol

Target: Opioid Receptor

Pathway: GPCR/G Protein; Neuronal Signaling

Storage: Sealed storage, away from moisture and light
Powder -80°C 2 years
-20°C 1 year
* In solvent : -80°C, 6 months; -20°C, 1 month (sealed storage, away from moisture and light)



SOLVENT & SOLUBILITY

In Vitro

H_2O : ≥ 100 mg/mL (194.71 mM)
DMSO : 33.33 mg/mL (64.90 mM; Need ultrasonic)
* "≥" means soluble, but saturation unknown.

Preparing Stock Solutions	Mass / Solvent / Concentration	1 mg	5 mg	10 mg
	1 mM	1.9471 mL	9.7354 mL	19.4708 mL
	5 mM	0.3894 mL	1.9471 mL	3.8942 mL
	10 mM	0.1947 mL	0.9735 mL	1.9471 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 (4.87 mM); Clear solution
2. Add each solvent one by one: 10% DMSO >> 90% (20% SBE-β-CD in saline)
   Solubility: ≥ 2.5 mg/mL (4.87 mM); Clear solution
3. Add each solvent one by one: 10% DMSO >> 90% corn oil
   Solubility: ≥ 2.5 mg/mL (4.87 mM); Clear solution

BIOLOGICAL ACTIVITY

Description DAMGO is a μ-opioid receptor (μ-OPR) selective agonist with a K_d of 3.46 nM for native μ-OPR[1].

IC_{50} & Target	μ Opioid Receptor/MOR
In Vitro	DAMGO (1-10 μM) significantly reduces the activation of neuronal Akt and ERK1/2 by CXCL12 and inhibits CXCL12-promoted neuronal survival, but does not down-regulate CXCR4 protein expression[2]. ?DAMGO (1 μM) effectively inhibits the prostaglandin E 2 (PGE 2) induced increase in a tetrodotoxin-resistant voltage-gated Na^+ current (TTX-R I_{Na}), i.e. PGE 2 (1 μM) can increase the TTX-R I_{Na} peak by 103 % compared to 24.9 % with the addition of DAMGO[3]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.
In Vivo	DAMGO (i.v., 0.5-2 mg/kg) can produce significant anti-injury effects on injured paws of male Sprague-Dawley rats weighing 200-225 g in a dose-dependent manner, producing an effective and long-lasting analgesic effect[4]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

PROTOCOL

Cell Assay [2]	Neurons (9 days in vitro) are treated with DAMGO (10 μM) for 24 h in their original culture dish, subsequently transferred to a dish containing Mg^{2+}-free saline with glycine (15 μM), and exposed to NMDA (100 μM) and/or CXCL12 (20 nM) in absence of glia. After treatments, neurons are moved back into the original culture dishes containing glia. Neuronal death is evaluated after 24 h. Hoechst 33342 (3 μg/mL) combined with cleaved caspase-3 (1:100) staining is used to identify normal and apoptotic cells[2]. MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Cell. 2023 Jan 19;186(2):413-427.e17.
- Cell. 2022 Nov 10;185(23):4361-4375.e19.

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REFERENCES

[1]. Gold MS, et al. DAMGO inhibits prostaglandin E2-induced potentiation of a TTX-resistant Na+ current in rat sensory neurons in vitro. Neurosci Lett. 1996 Jul 12;212(2):83-6.

[2]. Desmeules JA, et al. Selective opioid receptor agonists modulate mechanical allodynia in an animal model of neuropathic pain. Pain. 1993 Jun;53(3):277-285.

[3]. FEBS Lett. 1995 Jan 2;357(1):93-7. Onogi T, et al. DAMGO, a mu-opioid receptor selective agonist, distinguishes between mu- and delta-opioid receptors around their first extracellular loops.

[4]. Patel JP, et al. Modulation of neuronal CXCR4 by the micro-opioid agonist DAMGO. J Neurovirol. 2006 Dec;12(6):492-500.

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