

Product Data Sheet

Product Name: CWHM-12

Cat. No.: GC13050

Chemical Properties

Cas. No. 1564286-55-0

Chemical Name (2S)-3-[(2-aminoacetyl)-[3-hydroxy-5-[(5-hydroxy-1,4,5,6-tetrahydropyrimidin-2-yl)amino]benzoyl]amino]-2-(3-bromo-5-tert-butylphenyl)propanoic acid

SMILES CC(C)(C)C1=CC(=CC(=C1)C(CN(C(=O)CN)C(=O)C2=CC(=CC(=C2)O)NC3=NCC(CN3)O)C(=O)O)Br

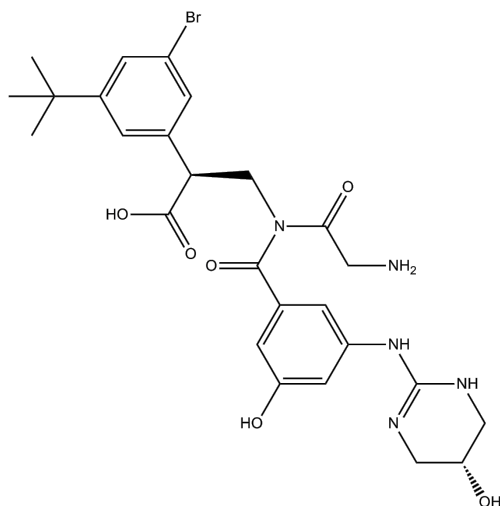
Formula $C_{26}H_{32}BrN_5O_6$ M.Wt 590.47

Solubility DMF: 1 mg/ml, DMSO: 1 mg/ml, DMSO: PBS (pH 7.2) (1:2): 0.33 mg/ml
Storage Store at -20°C

General tips For obtaining a higher solubility, please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution: ship with blue ice All other available size: ship with RT, or blue ice upon request.

Structure



Protocol

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

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Cell experiment [1]:

Cell lines mouse ameloblast-lineage cells

Preparation Method Immortalized mouse ameloblast-lineage cells (ALCs), originally isolated from neonatal C57BL/6J mouse mandibular molars, were cultured in DMEM/F12 medium supplemented with 10% fetal bovine serum and 1% penicillin-streptomycin at 37°C in a 5% CO₂ atmosphere. The lentiviral vector system contained CMV promoter and puromycin resistance marker. We used the following constructs: (1) LV18-*Odaph*-mus (LV-*Odaph*; insert sequence: 5'-GATGTAGTCACCCCTCCTGG-3') for *Odaph* overexpression; (2) LV18-NC (LV-NC) as negative control; and (3) LV3-NC (shNC) as scramble control. ALC cells were transduced with respective lentiviruses in medium containing 5µg/mL polybrene to enhance transduction efficiency. ODAPH expression level was quantified by Quantitative real-time PCR (qRT-PCR) and western blot at 72 hours post-transduction. Then cells were treated with either: (1) 1mM CWHM-12 or (2) vehicle control (0.1% DMSO) for 3h to assess acute inhibition effects by qRT-PCR.

Reaction
Conditions 1mM; 3h

Applications CWHM-12 completely abolished ODAPH-mediated Tgfb1 upregulation and reversed Alpl expression induction in mouse ameloblast-lineage cells (ALCs).

Animal experiment [2]:

Animal models C3HeB/FeJ (FeJ) mice

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Preparation Method	6-8 weeks C3HeB/FeJ (FeJ) mice were used in this experiment. Mtb strain HN878 was cultured in Proskauer Beck medium containing 0.05% Tween 80 to mid-log phase and frozen in 2mL aliquots at -80°C. Mice were aerosol infected with 100Mtb colony-forming units (CFUs). At 30 days postinfection (dpi), organs were harvested, homogenized, and serial dilutions of tissue homogenates were plated on 7H11 agar plates, and CFU was determined. CWHM-12 was solubilized in 50% dimethyl sulfoxide (DMSO; in sterile water) and dosed to 100mg/kg body weight per day. Drug or vehicle (50% DMSO) was delivered by implantable ALZET osmotic minipumps. Pumps were inserted subcutaneously; CWHM-12 was delivered by continuous infusion at 100mg/kg/day, and lungs were harvested at 14, 30, and 45 dpi. Lungs from Mtb-infected mice were perfused with 10% neutral buffered formalin and were paraffin embedded for histological analysis. IL-10 and MIP-2 protein levels in lung homogenates were measured using a mouse Luminex assay.
Dosage form	100mg/kg/day; 45 days; continuous subcutaneous infusion via ALZET osmotic minipumps
Applications	CWHM-12 reduced lung and spleen bacterial burden, suppressed MIP-2 and IL-10 production, and enhanced collagen deposition in Mycobacterium tuberculosis HN878-infected C3HeB/FeJ mice.

References:

- [1] Li M, Zhang J, Xiao S, et al. Odontogenesis-associated phosphoprotein (ODAPH) Promotes Ameloblast adhesion and alkaline phosphatase (ALP) expression via LAMC2/ ITGB6/TGF- β 1 signaling pathway. *PLoS One*. 2025;20(7):e0328263.
- [2] Scott NR, Thirunavukkarasu S, Rangel-Moreno J, Griggs DW, Khader SA. CWHM-12, an Antagonist of Integrin-Mediated Transforming Growth Factor-Beta Activation Confers Protection During Early *Mycobacterium tuberculosis* Infection in Mice. *J Interferon Cytokine Res*. 2022;42(8):421-429.

Background

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CWHM-12 is a potent inhibitor of α V integrins with IC₅₀ values of 0.2, 0.8, 1.5, and 1.8nM for α v β 8, α v β 3, α v β 6, and α v β 1^[1]. The α V integrin family comprises a group of heterodimeric transmembrane receptors that recognize RGD-containing extracellular matrix proteins and play key roles in mediating cell adhesion, migration, TGF- β activation, and tissue remodeling^[2]. CWHM-12 is usually used in research on liver fibrosis, lung fibrosis, and tumor microenvironment^{[3][4]}.

In vitro, CWHM-12 (1mM; 3h) completely abolished odontogenesis-associated phosphoprotein (ODAPH)-mediated Tgfb1 upregulation and reversed Alpl expression in mouse ameloblast-lineage cells (ALCs)^[5].

In vivo, CWHM-12 (100mg/kg/day; 4 weeks; continuous subcutaneous infusion via mini-osmotic pumps) reversed established liver fibrosis, reduced hepatic collagen content, decreased α -SMA-positive activated hepatic stellate cells, induced HSC apoptosis, and suppressed TGF β /SMAD3 signaling in a choline deficient, amino-acid defined, high-fat diet (CDAHFD) -induced NASH mouse model^[6]. CWHM-12 (100mg/kg/day; 45 days; continuous subcutaneous infusion via mini-osmotic pumps) reduced lung and spleen bacterial burden, decreased alveolar macrophages and neutrophils while increasing recruited macrophages, suppressed iNOS, MIP-2 and IL-10 production, and enhanced collagen deposition in Mycobacterium tuberculosis HN878-infected C3HeB/FeJ mice^[7].

References:

- [1] Henderson NC, Arnold TD, Katamura Y, et al. Targeting of α v integrin identifies a core molecular pathway that regulates fibrosis in several organs. *Nat Med*. 2013;19(12):1617-1624.
- [2] Lafrenie RM, Yamada KM. Integrin-dependent signal transduction. *J Cell Biochem*. 1996;61(4):543-553.
- [3] Basta J, Robbins L, Stout L, Prinsen MJ, Griggs DW, Rauchman M. Pharmacologic inhibition of RGD-binding integrins ameliorates fibrosis and improves function following kidney injury. *Physiol Rep*. 2020;8(7):e14329.
- [4] Fausther M, Dranoff JA. Integrins, myofibroblasts, and organ fibrosis. *Hepatology*. 2014;60(2):756-758.
- [5] Li M, Zhang J, Xiao S, et al. Odontogenesis-associated phosphoprotein (ODAPH) Promotes Ameloblast adhesion and alkaline phosphatase (ALP) expression via LAMC2/ ITGB6/TGF- β 1 signaling pathway. *PLoS One*. 2025;20(7):e0328263.
- [6] Ulmasov B, Noritake H, Carmichael P, Oshima K, Griggs DW, Neuschwander-Tetri BA. An

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Inhibitor of Arginine-Glycine-Aspartate-Binding Integrins Reverses Fibrosis in a Mouse Model of Nonalcoholic Steatohepatitis. *Hepatol Commun.* 2018;3(2):246-261.

[7] Scott NR, Thirunavukkarasu S, Rangel-Moreno J, Griggs DW, Khader SA. CWHM-12, an Antagonist of Integrin-Mediated Transforming Growth Factor-Beta Activation Confers Protection During Early *Mycobacterium tuberculosis* Infection in Mice. *J Interferon Cytokine Res.* 2022;42(8):421-429.

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