Small Molecules

Minocycline

Antibiotic with anti-inflammatory and neuroprotective properties

Catalog # 74112 25 mg
74114 100 mg

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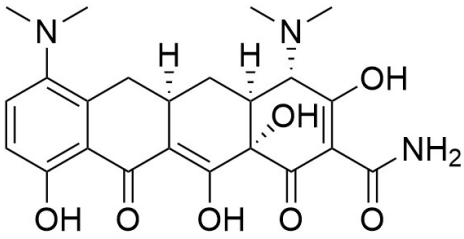
Product Description

Minocycline is a semi-synthetic tetracycline and antibiotic broadly used to treat various bacterial infections. It inhibits bacterial protein synthesis by binding to the 30S ribosomal subunit. It has also been reported to chelate with Ca2+ and Mg2+ (Lambs et al.). Reported to be anti-inflammatory, immunomodulatory, and neuroprotective (Garrido-Mesa et al.), some of its mechanism of actions include inhibiting enzymatic activities of inducible nitric oxide synthase (Amin et al.), matrix metalloproteinases (Golub et al.), and phospholipase A2 (Pruzanski et al.), inhibiting activation of caspase-1 and caspase-3 (Chen et al.), inhibiting activity of poly(ADP-ribose) polymerase 1 (Alano et al.), and reduction of p38 MAPK phosphorylation (Corbacella et al.). This product is supplied as the hydrochloride salt form of the molecule.

Molecular Name: Minocycline (Hydrochloride Hydrate)
Alternative Names: Minomycin; NSC 141993
CAS Number: Not applicable*
Chemical Formula: $C_{23}H_{27}N_3O_7 \bullet HCl \bullet XH_2O$
Molecular Weight: 493.9 g/mol
Purity: ≥ 98%
Chemical Name: 4,7-bis(dimethylamino)-1,4,4α,5,5α,6,11,12α-octahydro-3,10,12,12α,tetrahydroxy-1,11-dioxo-2-naphthacene-carboxamide, monohydrochloride hydrate*

*The degree to which this product is hydrated is unknown. The CAS number was previously provided but is now not applicable; 'hydrate' is now included in the Chemical Name. The product label for some lots may not be updated with these changes.

Structure:



• HCl [XH_2O]

Properties

Physical Appearance: A crystalline solid

Storage: Product stable at -20°C as supplied. Protect product from prolonged exposure to light. For long-term storage, store with a desiccant.
Stable as supplied for 12 months from date of receipt.

Solubility:
· DMSO ≤ 10 mM
· DMF ≤ 20 mM
For example, to prepare a 5 mM stock solution in DMSO, resuspend 10 mg in 4.05 mL of DMSO.

Prepare stock solution fresh before use. Information regarding stability of small molecules in solution has rarely been reported, however, as a general guide we recommend storage in DMSO at -20°C. Aliquot into working volumes to avoid repeated freeze-thaw cycles. The effect of storage of stock solution on compound performance should be tested for each application.

Compound has low solubility in aqueous media. For use as a cell culture supplement, stock solution should be diluted into culture medium immediately before use. Avoid final DMSO concentration above 0.1% due to potential cell toxicity.

Published Applications

REPROGRAMMING
· Enables derivation of extended pluripotent stem cells from both humans and mice (Yang et al.).
IMMUNOLOGY
· Reduces the production of interleukin-8 elicited by activation of protease-activated receptor 2 in normal human epidermal keratinocytes, thus attenuating the proinflammatory reactions (Ishikawa et al.).
DISEASE MODELING
· Enhances survival of neural stem cells in rat model of Ischemia (Sakata et al.).
· Supports neuroprotective effects in animal models of Parkinson's disease (Du et al.), Huntington's disease (Chen et al.), amyotrophic lateral sclerosis (Zhu et al.), Alzheimer's disease (Choi et al.), multiple sclerosis (Brundula et al.), and spinal cord injury (Festoff et al.; Garrido-Mesa et al.).
· Reduces bone and cartilage damage in rheumatoid arthritis via inhibition of collagenase and proteinase activity (Arsenis et al.; Greenwald et al.).

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