Small Molecules

SP600125

JNK pathway inhibitor; Inhibits JNK1, JNK2, and JNK3

Catalog # 72642

5 mg

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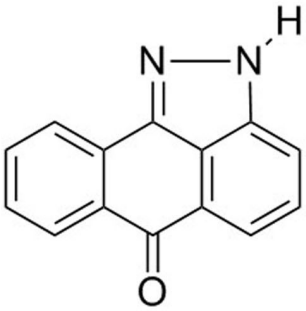
Product Description

SP600125 is an inhibitor of c-Jun N-terminal kinase (JNK). The three isoforms of JNK are members of the MAP kinase superfamily that induce the expression of immediate-early genes in response to specific stress and inflammatory signals. Through these actions, the JNK enzymes modulate cell proliferation, apoptosis, differentiation, and autophagy. SP600125 is a potent and reversible inhibitor of JNK1-3 (IC_{50} = 0.11 µM; Bennett et al.). It is cell permeable and dose-dependently inhibits c-Jun phosphorylation in cells, blocking the expression of COX-2 and TNF-α in monocytes and IL-10, TNF-α, and IFN-γ in T cells (Bennett et al.).

Molecular Name:	SP600125
Alternative Names:	NSC 75890; Pyrazolanthrone; 1PMV
CAS Number:	129-56-6
Chemical Formula:	$C_{14}H_8N_2O$
Molecular Weight:	220.2 g/mol
Purity:	≥ 98%
Chemical Name:	anthra[1,9-cd]pyrazol-6(2H)-one
Structure:	

Properties

Physical Appearance:	A crystalline solid
Storage:	Product stable at -20°C as supplied. Protect from prolonged exposure to light. Stable as supplied for 12 months from date of receipt.
Solubility:	· DMSO ≤ 90 mM · Absolute ethanol ≤ 2.2 mM For example, to prepare a 10 mM stock solution in DMSO, resuspend 5 mg in 2.27 mL of fresh 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
· Direct lineage reprogramming of fibroblasts to mature neurons, in combination with CHIR99021 (Catalog #72052), RepSox (Catalog #73792), Forskolin (Catalog #72112), Gö6983 (Catalog #72462), Valproic Acid (Catalog #72292) and Y-27632 (Catalog #72302) (Hu et al.).
DIFFERENTIATION
· Inhibits BMP9-induced osteogenic differentiation in cultured mouse mesenchymal stem cells (MSCs) and in primary bone marrow stromal cells (Zhao et al.).
· Promotes adipogenic, but represses osteogenic differentiation of human MSCs (Bilkovski et al.; Liu et al.; Qiu et al.; Tominaga et al.).
· Causes cell death and inhibits neurogenesis when added during early stages of neuronal culture (Tiwari et al.).

References

Bennett BL et al. (2001) SP600125, an anthrapyrazolone inhibitor of Jun N-terminal kinase. Proc Natl Acad Sci USA 98(24): 13681–6.
Bilkovski R et al. (2010) Role of WNT-5a in the determination of human mesenchymal stem cells into preadipocytes. J Biol Chem 285(9): 6170–8.
Hu W et al. (2015) Direct conversion of normal and Alzheimer's Disease human fibroblasts into neuronal cells by small molecules. Cell Stem Cell 17(2): 204–12.
Liu G et al. (2009) Canonical Wnts function as potent regulators of osteogenesis by human mesenchymal stem cells. J Cell Biol 185(1): 67–75.
Qiu W et al. (2011) Activation of non-canonical Wnt/JNK pathway by Wnt3a is associated with differentiation fate determination of human bone marrow stromal (mesenchymal) stem cells. Biochem Biophys Res Commun 413(1): 98–104.
Tiwari VK et al. (2012) A chromatin-modifying function of JNK during stem cell differentiation. Nat Genet 44(1): 94–100.
Tominaga S et al. (2005) Negative regulation of adipogenesis from human mesenchymal stem cells by Jun N-terminal kinase. Biochem Biophys Res Commun 326(2): 499–504.
Zhao Y et al. (2013) Activation of JNKs is essential for BMP9-induced osteogenic differentiation of mesenchymal stem cells. BMB Rep 46(8): 422–7.

Related Small Molecules

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This product is hazardous. Please refer to the Safety Data Sheet (SDS).