Small Molecules

(±)-Nutlin-3

p53 pathway activator; Inhibits MDM2

Catalog # 73752 1 mg
73754 10 mg

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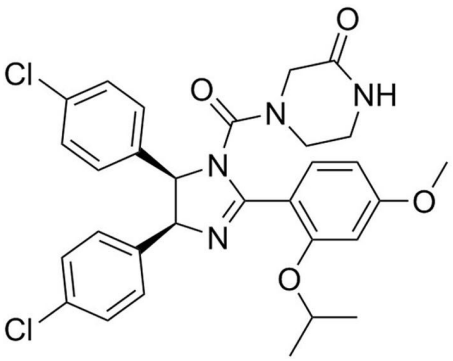
Product Description

(±)-Nutlin-3 is a small-imidazoline-based mouse double minute 2 (MDM2) protein antagonist which disrupts MDM2-p53 interaction (IC_{50} = 0.09 µM; Vassilev et al.). MDM2 binds the p53 tumor suppressor protein with high affinity and negatively modulates its transcriptional activity and stability. By disrupting this interaction, (±)-Nutlin-3 promotes the expression of p53-regulated genes and exhibits potent antiproliferative activity in cells with functional p53, but not in cells with mutated p53 (Gu et al.; Vassilev et al.).

Molecular Name:	(±)-Nutlin-3
Alternative Names:	Not applicable
CAS Number:	548472-68-0
Chemical Formula:	$C_{30}H_{30}Cl_2N_4O_4$
Molecular Weight:	581.5 g/mol
Purity:	> 98%
Chemical Name:	4-[4,5-bis(4-chlorophenyl)-2-(4-methoxy-2-propan-2-yloxyphenyl)-4,5-dihydroimidazole-1-carbonyl]piperazin-2-one
Structure:	

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 ≤ 85 mM · Absolute ethanol ≤ 85 mM For example, to prepare a 10 mM stock solution in DMSO, resuspend 1 mg in 172 µL 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

CANCER RESEARCH

· Inhibits the proliferation of exponentially growing human skin fibroblasts (IC_{50} = 2.2 µM) and mouse embryonic fibroblasts (IC_{50} = 1.3 µM), and suppresses the growth of established tumor xenografts in mice (Vassilev et al.).

· Leads to G1 cell cycle arrest in HCT116 colon carcinoma cell line expressing wild-type p53 and p21 (Benson et al.).

· Induces p53-mediated apoptosis in solid tumor and pediatric acute lymphoblastic leukemia cell lines (Gu et al.; Vaseva et al.).

References

Benson EK et al. (2014) p53-dependent gene repression through p21 is mediated by recruitment of E2F4 repression complexes. Oncogene 33(30): 3959–69.

Gu L et al. (2008) MDM2 antagonist nutlin-3 is a potent inducer of apoptosis in pediatric acute lymphoblastic leukemia cells with wild-type p53 and overexpression of MDM2. Leukemia 22(4): 730–9.

Vaseva A V et al. (2011) Blockade of Hsp90 by 17AAG antagonizes MDMX and synergizes with Nutlin to induce p53-mediated apoptosis in solid tumors. Cell Death Dis 2: e156.

Vassilev LT et al. (2004) In vivo activation of the p53 pathway by small-molecule antagonists of MDM2. Science 303(5659): 844–8.

Related Small Molecules

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