Small Molecules

Nocodazole

Microtubule polymerization inhibitor;
Inhibits beta-tubulin

Catalog #	74072	10 mg
	74074	50 mg

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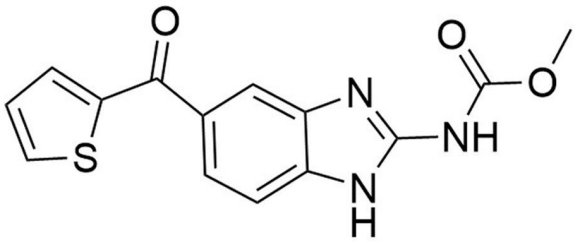
Product Description

Nocodazole is an anti-mitotic agent that reversibly interferes with the polymerization of microtubules (De Brabander et al.). Nocodazole binds to beta-tubulin and disrupts microtubule assembly/disassembly dynamics, impairing formation of the metaphase spindles during the cell division cycle. This prevents mitosis by inducing a G2/M-phase arrest and induces apoptosis in tumor cells (Jordan et al.).

Molecular Name:	Nocodazole
Alternative Names:	NSC 238159; Oncodazole; R 17934
CAS Number:	31430-18-9
Chemical Formula:	$C_{14}H_{11}N_3O_3S$
Molecular Weight:	301.3 g/mol
Purity:	≥ 98%
Chemical Name:	Methyl N-[5-(thiophene-2-carbonyl)-1H-1,3-benzodiazol-2-yl]carbamate
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 ≤ 16 mM For example, to prepare a 10 mM stock solution in DMSO, resuspend 10 mg in 3.32 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

GENOME EDITING
· Synchronizes human pluripotent stem cells (hPSCs) in the G2/M cell cycle phase, thereby increasing the efficiency of homology-directed repair (HDR) in CRISPR-Cas9 genome editing (Lin et al.; Yang et al.).
CANCER RESEARCH
· Induces apoptosis in leukemic cells without harming T cells and/or mesenchymal stromal cells that were recovered from the same patients (Frezzato et al.).

References

De Brabander MJ et al. (1976) The effects of methyl (5-(2-thienylcarbonyl)-1H-benzimidazol-2-yl) carbamate, (R 17934; NSC 238159), a new synthetic antitumoral drug interfering with microtubules, on mammalian cells cultured in vitro. Cancer Res 36(3): 905–16.
Frezzato F et al. (2014) Leukaemic cells from chronic lymphocytic leukaemia patients undergo apoptosis following microtubule depolymerization and Lyn inhibition by nocodazole. Br J Haematol 165(5): 659–72.
Jordan MA et al. (1992) Effects of vinblastine, podophyllotoxin and nocodazole on mitotic spindles. Implications for the role of microtubule dynamics in mitosis. J Cell Sci 102 (Pt 3): 401–16.
Lin S et al. (2014) Enhanced homology-directed human genome engineering by controlled timing of CRISPR/Cas9 delivery. eLife 3: e04766.
Yang D et al. (2016) Enrichment of G2/M cell cycle phase in human pluripotent stem cells enhances HDR-mediated gene repair with customizable endonucleases. Sci Rep 6: 21264.

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