Tubulin/HDAC-IN-4

Cat. No.: HY-162319

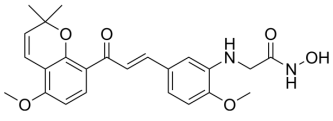
Molecular Formula: $C_{24}H_{26}N_2O_6$

Molecular Weight: 438.47

Target: Apoptosis; HDAC; Microtubule/Tubulin; Reactive Oxygen Species

Pathway: Apoptosis; Cell Cycle/DNA Damage; Epigenetics; Cytoskeleton; Immunology/Inflammation; Metabolic Enzyme/Protease; NF-κB

Storage: Please store the product under the recommended conditions in the Certificate of Analysis.



BIOLOGICAL ACTIVITY

Description

Tubulin/HDAC-IN-4 (compound 9n) is a dual Tubulin and HDAC inhibitor with IC_{50} values of 0.73, 0.43, 0.62, 2.34 μM for HDAC1, HDAC2, HDAC6, HDAC7, respectively. Tubulin/HDAC-IN-4 inhibits the tubulin polymerization by targeting the colchicine binding site. Tubulin/HDAC-IN-4 induces apoptosis and cell cycle arrest at G2/M phase. Tubulin/HDAC-IN-4 induces a significant elevation of intracellular ROS levels. Tubulin/HDAC-IN-4 shows anti-angiogenesis activity and anticancer activity[1].

IC_{50} & Target

HDAC1	HDAC2	HDAC6	HDAC7
0.73 μM (IC_{50})	0.43 μM (IC_{50})	0.62 μM (IC_{50})	2.34 μM (IC_{50})

In Vitro

Tubulin/HDAC-IN-4 (compound 9n) (0-10 μM; 72 h) shows cytotoxicity with IC_{50}s of 0.34, 0.29, 0.016, 0.15, 0.16 μM for MDA-MB-231, A549, PC-3, U251, MCF-7 cells, respectively[1].

Tubulin/HDAC-IN-4 (2.5, 5, 10, 20, 40 nM; 24 h) inhibits the colony formation of PC-3 cells in a dose-dependent manner[1].

Tubulin/HDAC-IN-4 (0.2, 1, 5, 25 μM) inhibits tubulin polymerization with an IC_{50} value of 4.82 μM[1].

Tubulin/HDAC-IN-4 (0.08, 0.16, 0.32; 24 h) increases the expression of Ac-α-tubulin and Ac-Histone H3 in PC-3 cells[1].

Tubulin/HDAC-IN-4 (0.08, 0.16, 0.32 μM; 24 h) induces apoptosis and cell cycle arrest at G2/M phase[1].

Tubulin/HDAC-IN-4 (0.08, 0.16, 0.32 μM; 24 h) induces a significant elevation of intracellular ROS levels[1].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Cell Cytotoxicity Assay[1]

Cell Line:	MDA-MB-231, A549, PC-3, U251, MCF-7 cells
Concentration:	0-10 μM
Incubation Time:	72 h
Result:	Showed cytotoxicity with IC_{50}s of 0.34, 0.29, 0.016, 0.15, 0.16 μM for MDA-MB-231, A549, PC-3, U251, MCF-7 cells, respectively.

Western Blot Analysis[1]

Cell Line:	PC-3 cells
Concentration:	0.08, 0.16, 0.32 μM

Incubation Time:	24 h
Result:	Increased in both the expression of HDAC6 substrate Ac-α-tubulin and HDAC1/2/3 substrate Ac-Histone H3 in a dose-dependent manner.

Cell Cycle Analysis[1]

Cell Line:	PC-3 cells
Concentration:	0.08, 0.16, 0.32 μM
Incubation Time:	24 h
Result:	Dose-dependently arrested PC-3 cells at G2/M phase, decreased in expression level of p-Cdc25cSer216, p-Cdc2Thr216 and p-CdcTyr15, increased the expression of Cyclin B1.

Apoptosis Analysis[1]

Cell Line:	PC-3 cells
Concentration:	0.08, 0.16, 0.32 μM
Incubation Time:	24 h
Result:	Induced apoptosis and increased the expression of cleaved PARP and cleaved Caspase 3, decreased the expression of Bim and Bcl-2.

In Vivo

Tubulin/HDAC-IN-4 (10, 20 mg/kg; i.v.; every two days for 21 days) shows anticancer activity[1].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	5-week-old male BALB/c nude mouse (PC-3 cells)[1]
Dosage:	10, 20 mg/kg
Administration:	I.v.; every two days for 21 days
Result:	Inhibited the growth of tumor with the tumor growth inhibition (TGI) reached 90.07% at 20 mg/kg.

REFERENCES

[1]. Shanshan Xie, et al. Design and biological evaluation of dual tubulin/HDAC inhibitors based on millepachine for treatment of prostate cancer. European Journal of Medicinal Chemistry. 2024, 268(15): 116301.

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