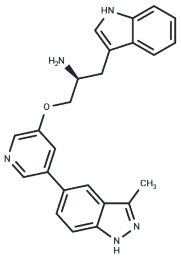
Data Sheet (Cat.No.T14072)

TargetMol

A-443654

Chemical Properties



CAS No. : 552325-16-3

Formula: C24H23N5O

Molecular Weight: 397.47

Storage: Powder: -20°C for 3 years | In solvent: -80°C for 1 year
Actual storage temperature shall be subject to the COA.

Biological Description

Description	A-443654, a pan-Akt inhibitor, exhibits equal potency against Akt1, Akt2, and Akt3 within cells (Ki=160 pM).
Targets(IC50)	ERK,FLT,Casein Kinase,MAPK,Akt,CDK,Chk,GSK-3,PKA,PKC,S6 Kinase,Src,VEGFR
In vitro	A-443654 demonstrates a significant improvement in potency with a K_i of 160 pM, a 30,000-fold increase compared to the initial lead molecule. It effectively reduces P-GSK3 in a dose-dependent manner across three cell lines and exhibits 40-fold greater selectivity for Akt over PKA, equally inhibiting Akt1, Akt2, and Akt3 within cells. Morphological changes induced by A-443654 are rapid, occurring within 2 to 4 hours in 10A and 10CA1a cells, with the latter being more sensitive. The compound hinders tumor cell proliferation, with an EC50 of 0.1 μM[1], and shows marked selectivity for mutant cells, inhibiting their growth more than 3.5 times compared to wild-type (WT) cells[3]. Furthermore, A-443654, especially when combined with rapamycin, significantly decreases Bcl-2 protein levels in 10A and 10CA1a cells, exhibiting a notable reduction in 10CA1a cells by approximately 70%. At 2 μM, A-443654 alone prompts 10CA1a cells to detach from the plate after 12 hours, illustrating a differential response compared to 10A cells, which remain unaffected at the same concentration[2].
In vivo	A-443654, administered subcutaneously at a dosage of 7.5 mg/kg per day, effectively inhibits tumor growth in the 3T3-Akt1 flank tumor model. At a higher concentration of 30 mg/kg, this compound increases phosphorylated Akt1 levels in MiaPaCa-2 tumors. Furthermore, a dosage of 50 mg/kg induces apoptosis in 3T3-Akt1 flank tumors [1].

Solubility Information

Solubility	DMSO: 150 mg/mL (377.39 mM),Sonication is recommended. (< 1 mg/ml refers to the product slightly soluble or insoluble)
In vivo Formulation	10% DMSO+40% PEG300+5% Tween 80+45% Saline: 4 mg/mL (10.06 mM),Sonication is recommended. *Please add the solvents sequentially, clarifying the solution as much as possible before adding the next one. Dissolve by heating and/or sonication if necessary. Working solution is recommended to be prepared and used immediately. The formulation provided above is for reference purposes only. In vivo formulations may vary and should be modified based on specific experimental conditions.*

Preparing Stock Solutions

	1mg	5mg	10mg
1 mM	2.5159 mL	12.5796 mL	25.1591 mL
5 mM	0.5032 mL	2.5159 mL	5.0318 mL
10 mM	0.2516 mL	1.258 mL	2.5159 mL
50 mM	0.0503 mL	0.2516 mL	0.5032 mL

Please select the appropriate solvent to prepare the stock solution, according to the solubility of the product in different solvents. Please use it as soon as possible.

Note: The dilution table applies only to solid products. For liquid products, please calculate the stock solution based on the stated concentration and/or density.

Reference

Luo Y, et al. Potent and selective inhibitors of Akt kinases slow the progress of tumors in vivo. Mol Cancer Ther. 2005 Jun;4(6):977-86.
Zheng J, et al. Rapamycin sensitizes Akt inhibition in malignant human breast epithelial cells. Cancer Lett. 2010 Oct 1;296(1):74-87.
Gallia GL, et al. Inhibition of Akt inhibits growth of glioblastoma and glioblastoma stem-like cells. Mol Cancer Ther. 2009 Feb;8(2):386-93.
Zhao Y, et al. Estrogen receptor alpha and beta regulate actin polymerization and spatial memory through an SRC-1/mTORC2-dependent pathway in the hippocampus of female mice. J Steroid Biochem Mol Biol. 2017 Nov; 174:96-113.