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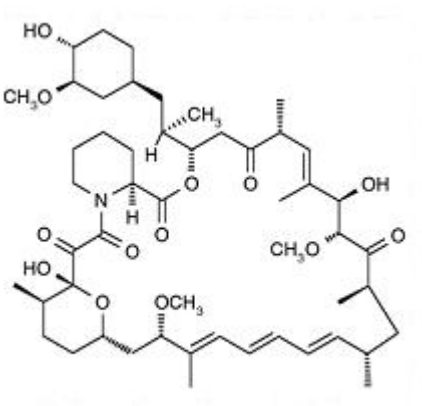
mTOR inhibitor Rapamycin

Chemical Name: (3S,6R,7E,9R,10R,12R,14S,15E,17E,19E,21S,23S,26R,27R,34aS)-9,10,12,13,14,21,22,23,24,25,26,27,32,33,34,34a-hexadecahydro-9,27-dihydroxy-3-[(1R)-2-[(1S,3R,4R)-4-hydroxy-3-methoxycyclohexyl]-1-methylethyl]-10,21-dimethoxy-6,8,12,14,20,26-hexamethyl-23,27-epoxy-3H-pyrido[2,1-c][1,4]-oxaazacyclohentriacontine-1,5,11,28,29 (4H,6H,31H)-pentone



Molecular Weight:	914.17
Formula:	$C_{51}H_{79}NO_{13}$
Purity:	≥98%
CAS#:	53123-88-9
Solubility:	DMSO up to 50 mM
Storage	Powder: 4ºC 1 year DMSO: 4ºC 3 month -20ºC 1 year

Biological Activity:

Rapamycin is a potent and selective mTOR inhibitor. Rapamycin, in complex with the cytosolic protein FK-binding protein 12 (FKBP12), inhibits mTOR Complex 1 (mTORC1) by binding to the FRB domain of mTor. Given the central roles mTor plays, Rapamycin showed diverse activities, including anti-proliferative effects in cancer cells, immunosuppressive effect, lifespan extension in mice, improved cognition in the mouse model of autism and Alzheimer, and inducing autophagy.

How to Use:

In vitro: Rapamycin is usually used at 1 μM final concentration in vitro and in cellular assays.

In vivo: Rapamycin could be orally administrated to mice at 5-20 mg/kg once per day.

Reference:

1. Vézina C, et al. Rapamycin (AY-22,989), a new antifungal antibiotic. (1975) J. Antibiot. 28 (10): 721.
2. Heitman J, et al. Targets for cell cycle arrest by the immunosuppressant rapamycin in yeast. (1991) Science. 253: 905-909.
3. Price DJ, et al. Rapamycin-induced inhibition of the 70-kilodalton S6 protein kinase. (1992) Science. 257: 973-977.
4. Wells AD, et al. Requirement for T-cell apoptosis in the induction of peripheral transplantation tolerance. (1999) Nat. Med.5:1303-1307.
5. Wendel HG, et al. Survival signalling by Akt and eIF4E in oncogenesis and cancer therapy. (2004) Nature 428 (6980): 332–7.
6. Ehninger D, et al. Reversal of learning deficits in a Tsc2+/- mouse model of tuberous sclerosis. (2008) Nat. Med. 14 (8): 843–8

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7. Harrison DE, et al. Rapamycin fed late in life extends lifespan in genetically heterogeneous mice. (2009) Nature 460 (7253): 392–5.