Revision 1

Store at -20C

Torin 1

#14379

5 mg

Cell Signaling TECHNOLOGY®

Orders: 877-616-CELL (2355) orders@cellsignal.com

Support: 877-678-TECH (8324)

Web: info@cellsignal.com cellsignal.com

3 Trask Lane | Danvers | Massachusetts | 01923 | USA

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Background

Torin 1 is a potent and selective ATP-competitive mTOR inhibitor (1,2). Researchers have shown that Torin 1 inhibits mTORC1 and mTORC2 in cell-free kinase assays with IC_{50} values of 2 nM and 10 nM, respectively (1,2). Torin 1 displays nearly 1000-fold selectivity for mTOR over PI3 Kinase (IC_{50} ~1.8 µM), 200-fold selectivity over ATM, DNA-PK, and hVps34, and does not significantly inhibit a panel of 353 serine/threonine, tyrosine, and lipid kinases at 10 µM. Torin 1 has also been shown to cause cell cycle arrest via a rapamycin-resistant mechanism independent of mTORC2 (1). Torin 1 treatment of cells leads to the dephosphorylation of mTOR downstream targets including p70 S6 kinase, S6 Ribosomal Protein, and 4E-BP1 (1-4). Activation and nuclear translocation of TFEB (EC_{50} = ~148 nM) by Torin 1 inhibition of mTORC1 has also been observed (5).

Molecular Formula

$C_{35}H_{28}F_3N_5O_2$

Molecular Weight

607.62 g/mol

Purity

>98%

CAS

1222998-36-8

Solubility

Soluble in DMSO at 2mg/ml.

Storage

Store lyophilized or in solution at -20°C, desiccated. In lyophilized form, the chemical is stable for 24 months. Once in solution, use within 3 months to prevent loss of potency. Aliquot to avoid multiple freeze/thaw cycles.

Directions for Use

Torin 1 is supplied as a lyophilized powder. For a 1 mM stock, reconstitute the 5 mg in 8.23 ml DMSO. First add 1 ml DMSO to the tube containing the chemical, vortex, and dispense into a new, larger tube. Repeat this action two or three more times to transfer any residual material. Add additional DMSO to the new tube to bring the volume up to 8.23 ml. Heating to 37°C and/or additional vortexing may be required.

Working concentrations and length of treatment can vary depending on the desired effect, but it is typically used at 10-1,000 nM for 1-24 hr.

Background References

1. Thoreen, C.C. et al. (2009) *J Biol Chem* 284, 8023-32.
2. Liu, Q. et al. (2010) *J Med Chem* 53, 7146-55.
3. Hong, S.K. et al. (2013) *Int J Oncol* 43, 2031-8.
4. Peterson, T.R. et al. (2011) *Cell* 146, 408-20.
5. Settembre, C. et al. (2012) *EMBO J* 31, 1095-108.

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