Revision 1

Store at -20C

#14385

Torin 2

5 mg

Cell Signaling TECHNOLOGY®

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Background

Torin 2 is a potent and selective ATP-competitive mTOR inhibitor with superior pharmacokinetics over the Torin 1 predecessor (1,2). A series of *in vitro* kinase activity assays indicate that Torin 2 inhibits mTORC1 with an IC_{50} of 2.1 nM. Cellular activity assays demonstrate that Torin 2 inhibits cellular mTOR activity with an EC_{50} of 0.25 nM. These assays also indicate that Torin 2 has an 800-fold selectivity over P13K (EC_{50} of 200 nM) and a over 800-fold selectivity over 400 other protein kinases (2). Unlike Torin 1, Torin 2 inhibits the phosphatidylinositol-3 kinase–like kinase (PIKK) family members ATM (EC_{50} = 25 nM), ATR (EC_{50} = 35 nM), and DNA-PK (IC_{50} = 118 nM) (2). Investigators demonstrate that Torin 2 treatment of cells attenuates phosphorylation of mTOR downstream targets, inhibits cell proliferation of several cancer cell types, and induces apoptosis and autophagy (2,3). Indirect activation and nuclear translocation of TFEB (EC_{50} = ~1.6 nM) through Torin 2 inhibition of mTORC1 has also been observed (4).

Molecular Formula

$C_{24}H_{15}F_3N_4O$

Molecular Weight

432.4 g/mol

Purity

>98%

CAS

1223001-51-1

Solubility

Soluble in DMSO at 8mg/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 2 is supplied as a lyophilized powder. For a 5 mM stock, reconstitute the 5 mg in 2.31 ml DMSO. First add 1 ml DMSO to the tube containing the chemical, vortex, and dispense into a new, larger tube. Repeat this action to transfer any residual material. Add additional DMSO to the new tube to bring the volume up to 2.31 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. Liu, Q. et al. (2011) *J Med Chem* 54, 1473-80.
2. Liu, Q. et al. (2013) *Cancer Res* 73, 2574-86.
3. Zullo, A.J. et al. (2014) *BMC Biochem* 15, 4.
4. Settembre, C. et al. (2012) *EMBO J* 31, 1095-108.

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