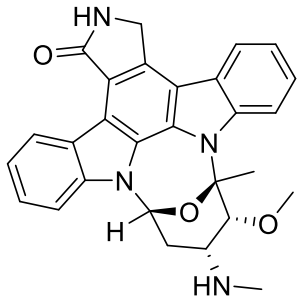
Product data sheet

MedKoo Cat#: 206463 Name: Staurosporine CAS: 62996-74-1 Chemical Formula: $C_{28}H_{26}N_4O_3$ Exact Mass: 466.2005 Molecular Weight: 466.541	
Product supplied as:	Powder
Purity (by HPLC):	≥ 98%
Shipping conditions	Ambient temperature
Storage conditions:	Powder: -20°C 3 years; 4°C 2 years.
	In solvent: -80°C 3 months; -20°C 2 weeks.

1. Product description:

Staurosporine, also known as antibiotic AM-2282 or STS, is a potent, non-selective inhibitor of protein kinases, including protein kinase C with promising anti-cancer activity. Staurosporine is a natural product originally isolated in 1977 from the bacterium Streptomyces staurosporeus. Staurosporine was discovered to have biological activities ranging from anti-fungal to anti-hypertensive. Staurosporine induces apoptosis in pancreatic carcinoma cells via the intrinsic signaling pathway. Staurosporine synergizes with the HER2 inhibitor lapatinib to restore sensitivity toward HER2 inhibition in a HER2 inhibitor resistant breast cancer model.

2. CoA, QC data, SDS, and handling instruction

SDS and handling instruction, CoA with copies of QC data (NMR, HPLC and MS analytical spectra) can be downloaded from the product web page under "QC And Documents" section. Note: copies of analytical spectra may not be available if the product is being supplied by MedKoo partners. Whether the product was made by MedKoo or provided by its partners, the quality is 100% guaranteed.

3. Solubility data

Solvent	Max Conc. mg/mL	Max Conc. mM
DMSO	43.94	94.19
Methanol	2.0	4.29

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	**1 mg**	**5 mg**	**10 mg**
1 mM	2.14 mL	10.72 mL	21.43 mL
5 mM	0.43 mL	2.14 mL	4.29 mL
10 mM	0.21 mL	1.07 mL	2.14 mL
50 mM	0.04 mL	0.21 mL	0.43 mL

5. Molarity Calculator, Reconstitution Calculator, Dilution Calculator

Please refer the product web page under section of "Calculator"

6. Recommended literature which reported protocols for in vitro and in vivo study

In vitro study

1. Pandeya A, Khalko RK, Singh S, Kumar M, Gosipatala SB. Hcmv-miR-UL148D regulates the staurosporine-induced apoptosis by targeting the Endoplasmic Reticulum to Nucleus signaling 1(ERN1). PLoS One. 2022 Sep 26;17(9):e0275072. doi: 10.1371/journal.pone.0275072. PMID: 36156601; PMCID: PMC9512192.
2. Brunelli F, Torosantucci L, Gelmetti V, Franzone D, Grünewald A, Krüger R, Arena G, Valente EM. PINK1 Protects against Staurosporine-Induced Apoptosis by Interacting with Beclin1 and Impairing Its Pro-Apoptotic Cleavage. Cells. 2022 Feb 15;11(4):678. doi: 10.3390/cells11040678. PMID: 35203326; PMCID: PMC8870463.

In vivo study

1. Kim YH, Gum SI, Lee TY, Shin JY, Ma JY, Kim I, Park YJ, Jung JC. The neuroprotective effect of staurosporine on mouse retinal ganglion cells after optic nerve injury. Int J Clin Exp Pathol. 2017 Jul 1;10(7):7920-7928. PMID: 31966642; PMCID: PMC6965234.
2. Tagliati F, Gagliano T, Gentilin E, Minoia M, Molè D, Delgi Uberti EC, Zatelli MC. Magmas overexpression inhibits staurosporine induced apoptosis in rat pituitary adenoma cell lines. PLoS One. 2013 Sep 17;8(9):e75194. doi: 10.1371/journal.pone.0075194. Erratum in: PLoS One. 2013 Sep 27;8(9):null. PMID: 24069394; PMCID: PMC3775776.

Product data sheet

7. Bioactivity

Biological target:

Staurosporine is a potent, ATP-competitive and non-selective inhibitor of protein kinases with IC_{50}s of 6 nM, 15 nM, 2 nM, and 3 nM for PKC, PKA, c-Fgr, and Phosphorylase kinase respectively. Staurosporine also inhibits TAOK2 with an IC_{50} of 3 μM.

In vitro activity

The gene expression analysis through RT-qPCR (list of primers are provided in Table 1) shows that staurosporine treatment significantly induces the mRNA levels of ERN1, MOAP1, BAK1, Caspase-3, and Caspase 7 when compared to the untreated control group. These results suggest that staurosporine-mediated apoptosis in HEK293T cells largely depends upon ERN1, MOAP1, and BAK1, which may be the key initiator molecules for the apoptosis pathway in our model.

Reference: PLoS One. 2022 Sep 26;17(9):e0275072. https://pubmed.ncbi.nlm.nih.gov/36156601/

In vivo activity

PBS-injected non-ONI (optic nerve injury) control mouse retina had an average RGC cell number of 151.75 ± 12.01 in captured photos. In comparison with the control, this study found that by 30 days after the ONI, there was substantial reduction in the number of retinal ganglion cells. PBS-injected ONI retinas had an approximate 63.59% loss of RGC (remaining RGC 36.4 ± 9.55%; $P<0.001$). In contrast, STS (staurosporine) injection significantly promoted RGC survival by an approximate 25.54% compared with PBS injection (remaining RGC approximately 61.94 ± 6.91%; $P<0.01$). The above results prove that STS can act as a neuroprotectant for ganglion cells that would otherwise die from ONI-induced neurotoxicity.

Reference: Int J Clin Exp Pathol. 2017 Jul 1;10(7):7920-7928. https://pubmed.ncbi.nlm.nih.gov/31966642/

Note: The information listed here was extracted from literature. MedKoo has not independently retested and confirmed the accuracy of these methods. Customer should use it just for a reference only.