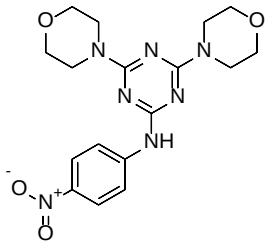
Product data sheet

MedKoo Cat#: 406654 Name: MHY1485 CAS: 326914-06-1 Chemical Formula: $C_{17}H_{21}N_7O_4$ Exact Mass: 387.1655 Molecular Weight: 387.40	
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:
MHY1485 is an mTOR activator that potently inhibits autophagy by suppression of fusion between autophagosomes and lysosomes.

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
DMF	5.0	12.91
DMSO	6.06	15.65

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	2.58 mL	12.91 mL	25.81 mL
5 mM	0.52 mL	2.58 mL	5.16 mL
10 mM	0.26 mL	1.29 mL	2.58 mL
50 mM	0.05 mL	0.26 mL	0.52 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. Zhou J, Yao W, Li C, Wu W, Li Q, Liu H. Administration of follicle-stimulating hormone induces autophagy via upregulation of HIF-1α in mouse granulosa cells. Cell Death Dis. 2017 Aug 17;8(8):e3001. doi: 10.1038/cddis.2017.371. PMID: 28817115; PMCID: PMC5596559.

2. Choi YJ, Park YJ, Park JY, Jeong HO, Kim DH, Ha YM, Kim JM, Song YM, Heo HS, Yu BP, Chun P, Moon HR, Chung HY. Inhibitory effect of mTOR activator MHY1485 on autophagy: suppression of lysosomal fusion. PLoS One. 2012;7(8):e43418. doi: 10.1371/journal.pone.0043418. Epub 2012 Aug 22. Erratum in: PLoS One. 2013;8(1). doi:10.1371/annotation/e3163ad5-f3d8-4a21-b3e1-f2033a76f9db. PMID: 22927967; PMCID: PMC3425474.

In vivo study

1. Liu P, Li M, Wu W, Liu A, Hu H, Liu Q, Yi C. Protective effect of omega-3 polyunsaturated fatty acids on sepsis via the AMPK/mTOR pathway. Pharm Biol. 2023 Dec;61(1):306-315. doi: 10.1080/13880209.2023.2168018. PMID: 36694426; PMCID: PMC9879202.

2. Cheng Y, Kim J, Li XX, Hsueh AJ. Promotion of ovarian follicle growth following mTOR activation: synergistic effects of AKT stimulators. PLoS One. 2015 Feb 24;10(2):e0117769. doi: 10.1371/journal.pone.0117769. PMID: 25710488; PMCID: PMC4340052.

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7. Bioactivity

Biological target:

MHY1485 is a potent cell-permeable mTOR activator that targets the ATP domain of mTOR.

In vitro activity

Autophagy is a major degradative process responsible for the disposal of cytoplasmic proteins and dysfunctional organelles via the lysosomal pathway. Treatment with MHY1485 suppressed the basal autophagic flux, and this inhibitory effect was clearly confirmed in cells under starvation, a strong physiological inducer of autophagy. The levels of p62 and beclin-1 did not show significant change after treatment with MHY1485. Decreased co-localization of autophagosomes and lysosomes in confocal microscopic images revealed the inhibitory effect of MHY1485 on lysosomal fusion during starvation-induced autophagy. These effects of MHY1485 led to the accumulation of LC3II and enlargement of the autophagosomes in a dose- and time-dependent manner. Furthermore, MHY1485 induced mTOR activation and correspondingly showed a higher docking score than PP242, a well-known ATP-competitive mTOR inhibitor, in docking simulation. In conclusion, MHY1485 has an inhibitory effect on the autophagic process by inhibition of fusion between autophagosomes and lysosomes leading to the accumulation of LC3II protein and enlarged autophagosomes. MHY1485 also induces mTOR activity, providing a possibility for another regulatory mechanism of autophagy by the MHY compound. The significance of this study is the finding of a novel inhibitor of autophagy with an mTOR activating effect.

Reference: PLoS One. 2012;7(8):e43418. https://pubmed.ncbi.nlm.nih.gov/22927967/

In vivo activity

This study reports that treatment of ovaries from juvenile mice with an mTOR activator MHY1485 stimulated mTOR, S6K1 and rpS6 phosphorylation. Culturing ovaries for 4 days with MHY1485 increased ovarian explant weights and follicle development. In vivo studies further demonstrated that pre-incubation of these ovaries with MHY1485 for 2 days, followed by allo-grafting into kidney capsules of adult ovariectomized hosts for 5 days, led to marked increases in graft weights and promotion of follicle development.

Reference: PLoS One. 2015 Feb 24;10(2):e0117769. https://pubmed.ncbi.nlm.nih.gov/25710488/