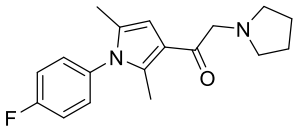
Product data sheet

MedKoo Cat#: 407102 Name: IU1 CAS: 314245-33-5 Chemical Formula: $C_{18}H_{21}FN_2O$ Exact Mass: 300.1638 Molecular Weight: 300.3774	
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:
IU1 is a selective USP14 inhibitor. IU1 prevents ventilator-induced lung injury in rats. IU1 inhibits the catalytic activity of proteasome-associated Usp14 in vitro (IC50 < 4 μM). IU1 stimulates proteasome activity and substrate degradation. USP14 removes the ubiquitin chain of I-κB, therefore inducing I-κB degradation and increasing cytokine release.

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	20.0	66.58
DMF:PBS (pH 7.2) (1:9)	0.1	0.33
DMSO	40.56	135.02
Ethanol	40.0	133.17

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	3.33 mL	16.65 mL	33.29 mL
5 mM	0.67 mL	3.33 mL	6.66 mL
10 mM	0.33 mL	1.66 mL	3.33 mL
50 mM	0.07 mL	0.33 mL	0.67 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. Xu L, Wang J, Yuan X, Yang S, Xu X, Li K, He Y, Wei L, Zhang J, Tian Y. IU1 suppresses proliferation of cervical cancer cells through MDM2 degradation. Int J Biol Sci. 2020 Sep 16;16(15):2951-2963. doi: 10.7150/ijbs.47999. PMID: 33061808; PMCID: PMC7545697.
2. Lv C, Wang S, Lin L, Wang C, Zeng K, Meng Y, Sun G, Wei S, Liu Y, Zhao Y. USP14 maintains HIF1-α stabilization via its deubiquitination activity in hepatocellular carcinoma. Cell Death Dis. 2021 Aug 21;12(9):803. doi: 10.1038/s41419-021-04089-6. PMID: 34420039; PMCID: PMC8380251.

In vivo study

1. Kiprowska MJ, Stepanova A, Todaro DR, Galkin A, Haas A, Wilson SM, Figueiredo-Pereira ME. Neurotoxic mechanisms by which the USP14 inhibitor IU1 depletes ubiquitinated proteins and Tau in rat cerebral cortical neurons: Relevance to Alzheimer's disease. Biochim Biophys Acta Mol Basis Dis. 2017 Jun;1863(6):1157-1170. doi: 10.1016/j.bbadis.2017.03.017. Epub 2017 Apr 1. PMID: 28372990; PMCID: PMC5549686.

2. Song Y, Li Z, He T, Qu M, Jiang L, Li W, Shi X, Pan J, Zhang L, Wang Y, Zhang Z, Tang Y, Yang GY. M2 microglia-derived exosomes protect the mouse brain from ischemia-reperfusion injury via exosomal miR-124. Theranostics. 2019 May 4;9(10):2910-2923. doi: 10.7150/thno.30879. PMID: 31244932; PMCID: PMC6568171.

7. Bioactivity

Biological target:

IU1 is a special Usp14 inhibitor with an IC50 of 4-5 μM.

In vitro activity

Firstly, to determine the underlying effect of IU1 (a selective inhibitor of USP14) on the proliferation of cervical cancer cells, this study used the CCK-8 assay. HeLa cells were treated with various concentrations of IU1 (0.1, 0.2, 0.5, 1, 2, 5, 10, 20, 50, 100 μM) for 24 h, or 100 μM of IU1 for 12, 24, 48 h. SiHa cells were treated with 0.1, 0.5, 2, 5, 10, 20, 50, 100 μM IU1 for 24h, or 100 μM of IU1 for 12, 24, 48 h. This study found that IU1 significantly decreased cell proliferation in a time- and dose-dependent manner (Figure 1A-D).

Reference: Int J Biol Sci. 2020 Sep 16;16(15):2951-2963. https://pubmed.ncbi.nlm.nih.gov/33061808/

In vivo activity

This study assessed the protective efficacy of inhibiting or downregulating USP14 in rat and mouse (Usp14axJ) neuronal cultures treated with prostaglandin J2 (PGJ2). IU1 concentrations (HIU1>25μM) reported by others to inhibit USP14 and be protective in non-neuronal cells, reduced PGJ2-induced Ub-protein accumulation in neurons.

Reference: Biochim Biophys Acta Mol Basis Dis. 2017 Jun;1863(6):1157-1170. https://pubmed.ncbi.nlm.nih.gov/28372990/

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.