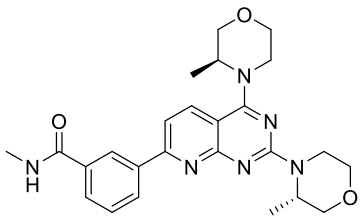
Product data sheet

MedKoo Cat#: 204520 Name: Vistusertib (AZD-2014) CAS#: 1009298-59-2 Chemical Formula: $C_{25}H_{30}N_6O_3$ Exact Mass: 462.23794 Molecular Weight: 462.54	
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:
Vistusertib, also known as AZD2014, is an orally bioavailable inhibitor of the mammalian target of rapamycin (mTOR) with potential antineoplastic activity. mTOR kinase inhibitor AZD2014 inhibits the activity of mTOR, which may result in the induction of tumor cell apoptosis and a decrease in tumor cell proliferation. mTOR, a serine/threonine kinase that is upregulated in a variety of tumors, plays an important role downstream in the PI3K/Akt/mTOR signaling pathway.

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	47.67	103.06
DMF	10.0	21.62
Ethanol	0.5	1.08

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	2.16 mL	10.81 mL	21.62 mL
5 mM	0.43 mL	2.16 mL	4.32 mL
10 mM	0.22 mL	1.08 mL	2.16 mL
50 mM	0.04 mL	0.22 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. Li S, Sheng J, Liu Z, Fan Y, Zhang C, Lv T, Hu S, Jin J, Yu W, Song Y. Potent antitumour of the mTORC1/2 dual inhibitor AZD2014 in docetaxel-sensitive and docetaxel-resistant castration-resistant prostate cancer cells. J Cell Mol Med. 2021 Mar;25(5):2436-2449. doi: 10.1111/jcmm.16155. Epub 2021 Jan 28. PMID: 33507584; PMCID: PMC7933970.
2. Kim HK, Kim SY, Lee SJ, Kang M, Kim ST, Jang J, Rath O, Schueler J, Lee DW, Park WY, Kim SJ, Park SH, Lee J. BEZ235 (PIK3/mTOR inhibitor) Overcomes Pazopanib Resistance in Patient-Derived Refractory Soft Tissue Sarcoma Cells. Transl Oncol. 2016 Jun;9(3):197-202. doi: 10.1016/j.tranon.2016.03.008. Epub 2016 May 12. PMID: 27267837; PMCID: PMC4907899.

In vivo study

1. Jones AT, Yang J, Narov K, Henske EP, Sampson JR, Shen MH. Allosteric and ATP-Competitive Inhibitors of mTOR Effectively Suppress Tumor Progression-Associated Epithelial-Mesenchymal Transition in the Kidneys of Tsc2+/- Mice. Neoplasia. 2019 Aug;21(8):731-739. doi: 10.1016/j.neo.2019.05.003. Epub 2019 Jun 14. PMID: 31207499; PMCID: PMC6580094.
2. Fantus D, Dai H, Ono Y, Watson A, Yokota S, Mohib K, Yoshida O, Ross MA, Watkins SC, Ramaswami B, Valusjkikh A, Rothstein DM, Thomson AW. Influence of the Novel ATP-Competitive Dual mTORC1/2 Inhibitor AZD2014 on Immune Cell

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Populations and Heart Allograft Rejection. Transplantation. 2017 Dec;101(12):2830-2840. doi: 10.1097/TP.0000000000001933. PMID: 28885497; PMCID: PMC5709200.

7. Bioactivity

Biological target:

Vistusertib (AZD2014) is an ATP competitive mTOR inhibitor with an IC50 of 2.81 nM.

In vitro activity

As shown by the results, in all the CRPC cell lines, AZD2014 effectively blocked the phosphorylation of 4EBP1 at Thr37/46 and that of AKT at Ser473 in a concentration-dependent manner, and this inhibitory effect was especially significant when the concentration was 100 nM or more. In contrast, rapamycin also had a certain weak inhibitory effect on 4EBP1 phosphorylation at Thr37/46 in a concentration-dependent manner but had little inhibitory effect on AKT phosphorylation at Ser473 even at a high concentration of 1000 nM (Figure 1A-D). These results demonstrate that AZD2014 is a potent inhibitor of mTORC1 and mTORC2 in CRPC cells that blocks mTOR signalling more thoroughly than rapamycin.

Reference: J Cell Mol Med. 2021 Mar; 25(5): 2436–2449. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7933970/

In vivo activity

Seventy-two hours thereafter, spleens were harvested and alloreactive tg T cell proliferation assessed by flow cytometry (Figure 4A). Compared to vehicle control-treated mice, those injected with either RAPA (1 mg/kg) or AZD2014 (10 mg/kg bid) showed marked inhibition of alloreactive CD4+ T cell proliferation (Figure 4B and C).

Reference: Transplantation. 2017 Dec; 101(12): 2830–2840. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5709200/