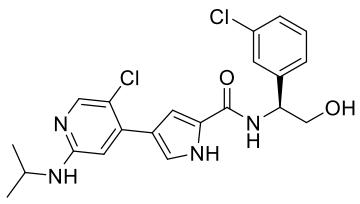
Product data sheet

MedKoo Cat#: 406561 Name: Ulixertinib (BVD-523) CAS#: 869886-67-9 (free base) Chemical Formula: $C_{21}H_{22}Cl_2N_4O_2$ Exact Mass: 432.11198 Molecular Weight: 433.33	
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:

Ulixertinib, also known as BVD-523 and VRT752271, is an inhibitor of ERK protein kinase. Downmodulation of ERK protein kinase activity inhibits VEGF secretion by human myeloma cells and myeloma-induced angiogenesis. Upon oral administration, BVD-523 inhibits both ERK 1 and 2, thereby preventing the activation of ERK-mediated signal transduction pathways. This results in the inhibition of ERK-dependent tumor cell proliferation and survival. The mitogen-activated protein kinase (MAPK)/ERK pathway is often upregulated in a variety of tumor cell types and plays a key role in tumor cell proliferation, differentiation and survival.

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	93.0	214.62
Ethanol	43.0	99.23

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	**1 mg**	**5 mg**	**10 mg**
1 mM	2.31 mL	11.54 mL	23.08 mL
5 mM	0.46 mL	2.31 mL	4.62 mL
10 mM	0.23 mL	1.15 mL	2.31 mL
50 mM	0.05 mL	0.23 mL	0.46 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. Xue Y, Chen W, Mai Z, Yu X, Wu Q, Wan C, Su X, Wu Y, Rong Z, Zheng H. Inhibition of the Extracellular Signal-Regulated Kinase/Ribosomal S6 Kinase Cascade Limits Chlamydia trachomatis Infection. J Invest Dermatol. 2021 Apr;141(4):852-862.e6. doi: 10.1016/j.jid.2020.07.033. Epub 2020 Sep 9. PMID: 32918951.
2. Ji N, Yang Y, Lei ZN, Cai CY, Wang JQ, Gupta P, Xian X, Yang DH, Kong D, Chen ZS. Ulixertinib (BVD-523) antagonizes ABCB1- and ABCG2-mediated chemotherapeutic drug resistance. Biochem Pharmacol. 2018 Dec;158:274-285. doi: 10.1016/j.bcp.2018.10.028. Epub 2018 Oct 26. PMID: 30431011

In vivo study

1. Xue Y, Chen W, Mai Z, Yu X, Wu Q, Wan C, Su X, Wu Y, Rong Z, Zheng H. Inhibition of the Extracellular Signal-Regulated Kinase/Ribosomal S6 Kinase Cascade Limits Chlamydia trachomatis Infection. J Invest Dermatol. 2021 Apr;141(4):852-862.e6. doi: 10.1016/j.jid.2020.07.033. Epub 2020 Sep 9. PMID: 32918951.
2. Germann UA, Furey BF, Markland W, Hoover RR, Aronov AM, Roix JJ, Hale M, Boucher DM, Sorrell DA, Martinez-Botella G, Fitzgibbon M, Shapiro P, Wick MJ, Samadani R, Meshaw K, Groover A, DeCrescenzo G, Namchuk M, Emery CM, Saha S, Welsch

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DJ. Targeting the MAPK Signaling Pathway in Cancer: Promising Preclinical Activity with the Novel Selective ERK1/2 Inhibitor BVD-523 (Ulixertinib). Mol Cancer Ther. 2017 Nov;16(11):2351-2363. doi: 10.1158/1535-7163.MCT-17-0456. Epub 2017 Sep 22. PMID: 28939558.

7. Bioactivity

Biological target:

Ulixertinib (BVD-523; VRT752271) is an ATP-competitive and reversible covalent inhibitor of ERK1/2 kinases, with an IC50 of <0.3 nM against ERK2.

In vitro activity

Whether ulixertinib could antagonize multidrug resistance (MDR) mediated by ATP-binding cassette (ABC) transporters was investigated. The results showed that ulixertinib, at non-toxic concentrations, significantly reversed ATP-binding cassette subfamily B member 1 (ABCB1)- and ATP-binding cassette subfamily G member 2 (ABCG2)-mediated MDR. In ABCB1-overexpressing cells, ulixertinib antagonized MDR by attenuating the efflux function of ABCB1. Similarly, in ABCG2-overexpressing cells, ulixertinib inhibited the efflux activity of ABCG2 and reversed resistance to substrate anticancer drugs. The reversal effects of ulixertinib were not related to the down-regulation or change of subcellular localization of ABCB1 or ABCG2. Mechanistic investigations revealed that ulixertinib stimulated the ATPase activity of both ABCB1 and ABCG2 in a concentration-dependent manner, and the in silico docking study predicted that ulixertinib could interact with the substrate-binding sites of both ABCB1 and ABCG2.

Reference: Biochem Pharmacol. 2018 Dec;158:274-285.
https://www.sciencedirect.com/science/article/abs/pii/S0006295218304556?via%3Dihub

In vivo activity

This study infected 6-week-old female BALB/c mice with Chlamydia serovar D to determine whether BVD-523 could inhibit Chlamydia development in vivo. DMSO, AZM, BVD-523, and AZM + BVD-523 were administered orally from day 5 to day 8 after infection. Vaginal swabs were taken on days 5 and 8 for cell culture and to determine the number of inclusions. No difference in the number of infectious progeny was recorded between day 5 and day 8 cultures ($P > 0.05$) (Figure 6a). However, the number of progeny was greatly reduced in the AZM-, BVD-523–, and AZM + BVD-523–treated groups on day 8 ($P < 0.05$) (Figure 6b–d). These data demonstrated that BVD-523 could inhibit C. trachomatis replication in vivo.

Reference: J Invest Dermatol. 2021 Apr;141(4):852-862.e6. https://www.jidonline.org/article/S0022-202X(20)32055-8/fulltext

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.