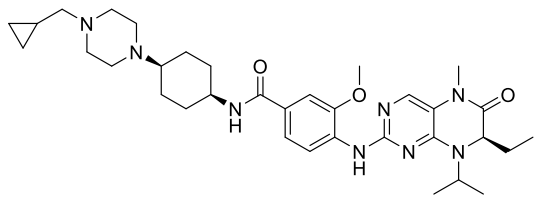
Product data sheet

MedKoo Cat#: 200494 Name: Volasertib CAS#: 755038-65-4 (free base) Chemical Formula: $C_{34}H_{50}N_8O_3$ Exact Mass: 618.40059 Molecular Weight: 618.81	
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:

Volasertib, also known as BI-6727, is a dihydropteridinone Polo-like kinase 1 (Plk1) inhibitor with potential antineoplastic activity. BI 6727 selectively inhibits Plk1, inducing selective G2/M arrest followed by apoptosis in a variety of tumor cells while causing reversible cell arrest at the G1 and G2 stage without apoptosis in normal cells. BI 6727 is highly potent (enzyme IC(50) = 0.87 nmol/L, EC(50) = 11-37 nmol/L on a panel of cancer cell lines) and selective dihydropteridinone with distinct properties.

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	40.0	64.64

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	1.62 mL	8.08 mL	16.16 mL
5 mM	0.32 mL	1.62 mL	3.23 mL
10 mM	0.16 mL	0.81 mL	1.62 mL
50 mM	0.03 mL	0.16 mL	0.32 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. Van den Bossche J, Deben C, De Pauw I, Lambrechts H, Hermans C, Deschoolmeester V, Jacobs J, Specenier P, Pauwels P, Vermorken JB, Peeters M, Lardon F, Wouters A. In vitro study of the Polo-like kinase 1 inhibitor volasertib in non-small-cell lung cancer reveals a role for the tumor suppressor p53. Mol Oncol. 2019 May;13(5):1196-1213. doi: 10.1002/1878-0261.12477. Epub 2019 Apr 5. PMID: 30859681; PMCID: PMC6487694.
2. Al Mamun Bhuyan A, Ashiqul Haque AKM, Sahu I, Cao H, Kormann MSD, Lang F. Inhibition of Suicidal Erythrocyte Death by Volasertib. Cell Physiol Biochem. 2017;43(4):1472-1486. doi: 10.1159/000481969. Epub 2017 Oct 16. PMID: 29035889.

In vivo study

1. Kats D, Ricker CA, Berlow NE, Noblet B, Nicolle D, Mevel K, Branchereau S, Judde JG, Stiverson CD, Stiverson CL, Svalina MN, Settelmeyer T, Matlock K, Lathara M, Mussini C, Geller JI, Noakes C, Sloma I, Bharathy N, Cairo S, Keller C. Volasertib preclinical activity in high-risk hepatoblastoma. Oncotarget. 2019 Nov 5;10(60):6403-6417. doi: 10.18632/oncotarget.27237. PMID: 31741706; PMCID: PMC6849653.
2. Murga-Zamalloa C, Polk A, Hanel W, Chowdhury P, Brown N, Hristov AC, Bailey NG, Wang T, Phillips T, Devata S, Poonnen P, Gomez-Gelvez J, Inamdar KV, Wilcox RA. Polo-like-kinase 1 (PLK-1) and c-myc inhibition with the dual kinase-bromodomain

inhibitor volasertib in aggressive lymphomas. Oncotarget. 2017 Dec 6;8(70):114474-114480. doi: 10.18632/oncotarget.22967. PMID: 29383095; PMCID: PMC5777707.

7. Bioactivity

Biological target:

Volasertib is a highly potent Polo-like kinase 1 (PLK1) inhibitor with an IC50 of 0.87 nM, as well as the two closely related kinases PLK2 and PLK3 with IC50s of 5 and 56 nM, respectively.

In vitro activity

As Plk1 is a major regulator of mitotic cell division, the cell cycle distribution was investigated immediately after treatment with volasertib (0–20 nm, 24 h). As presented in Fig. 2A, exposure to the Plk1 inhibitor caused a significant G2/M phase block in all NSCLC cell lines ($P < 0.047$), accompanied by a significant decrease in number of G1 and S phase cells (both $P < 0.001$). The G2/M arrest was clearly influenced by the volasertib concentration ($P < 0.050$), the p53 status of the cell line ($P < 0.001$), and the oxygen tension ($P < 0.001$) (Table 2). Post hoc analysis revealed that the increase in % G2/M phase cells induced by higher concentrations of volasertib (12.5 – 20 nm) was less pronounced in p53 wild-type NSCLC cells compared to cells without functional p53, at least under normoxia.

Reference: Mol Oncol. 2019 May; 13(5): 1196–1213. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6487694/

In vivo activity

To investigate this further in vivo, MyLa xenografts were generated in immunodeficient mice and treated with volasertib (or vehicle control). A rapid reduction in tumor volume was observed in volasertib treated mice (Figure 2D), such that only 4 (out of 10) tumors remained observable at the time of study termination (Figure 2D, inset) in volasertib-treated mice. A significant loss of c-myc expression was observed in these tumors (Figure 2E).

Reference: Oncotarget. 2017 Dec 29; 8(70): 114474–114480. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5777707/