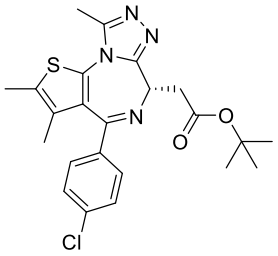
Product data sheet

MedKoo Cat#: 406669 Name: (+)-JQ1 CAS#: 1268524-70-4 Chemical Formula: $C_{23}H_{25}ClN_4O_2S$ Exact Mass: 456.13867 Molecular Weight: 456.99	
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:

(+)-JQ1 is a BET potent BET bromodomain Inhibitor. Bromodomain and extra terminal domain (BET) proteins are important epigenetic regulators facilitating the transcription of genes in chromatin areas linked to acetylated histones. JQ1 has antiproliferative activity against many cancers, mainly through inhibition of c-MYC and upregulation of p21. JQ1 suppresses tumor growth through downregulating LDHA in ovarian cancer. JQ1 suppresses growth of pancreatic ductal adenocarcinoma in patient-derived xenograft models. JQ1 disrupts human dendritic cell maturation by inhibiting STAT5.

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	47.93	104.87
DMF	16.0	35.01
DMF:PBS (pH 7.2) (1:9)	0.1	0.22
Ethanol	50.23	109.91

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	**1 mg**	**5 mg**	**10 mg**
1 mM	2.19 mL	10.94 mL	21.88 mL
5 mM	0.44 mL	2.19 mL	4.38 mL
10 mM	0.22 mL	1.09 mL	2.19 mL
50 mM	0.04 mL	0.22 mL	0.44 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. Zhang MY, Liu SL, Huang WL, Tang DB, Zheng WW, Zhou N, Zhou H, Abudureheman T, Tang ZH, Zhou BS, Duan CW. Bromodomains and Extra-Terminal (BET) Inhibitor JQ1 Suppresses Proliferation of Acute Lymphocytic Leukemia by Inhibiting c-Myc-Mediated Glycolysis. Med Sci Monit. 2020 Apr 8;26:e923411. doi: 10.12659/MSM.923411. PMID: 32266878; PMCID: PMC7165247.
2. Qian Z, Shuying W, Ranran D. Inhibitory effects of JQ1 on listeria monocytogenes-induced acute liver injury by blocking BRD4/RIPK1 axis. Biomed Pharmacother. 2020 May;125:109818. doi: 10.1016/j.biopha.2020.109818. Epub 2020 Feb 25. PMID: 32106368.

In vivo study

Product data sheet

1. Li F, MacKenzie KR, Jain P, Santini C, Young DW, Matzuk MM. Metabolism of JQ1, an inhibitor of bromodomain and extra terminal bromodomain proteins, in human and mouse liver microsomes†. Biol Reprod. 2020 Aug 4;103(2):427-436. doi: 10.1093/biolre/ioaa043. PMID: 32285106; PMCID: PMC7401416.
2. Zhou S, Zhang S, Wang L, Huang S, Yuan Y, Yang J, Wang H, Li X, Wang P, Zhou L, Yang J, Xu Y, Gao H, Zhang Y, Lv Y, Zou X. BET protein inhibitor JQ1 downregulates chromatin accessibility and suppresses metastasis of gastric cancer via inactivating RUNX2/NID1 signaling. Oncogenesis. 2020 Mar 10;9(3):33. doi: 10.1038/s41389-020-0218-z. PMID: 32157097; PMCID: PMC7064486.

7. Bioactivity

Biological target:

(+)-JQ-1 (JQ1) is a reversible BET bromodomain inhibitor, with IC50s of 77 and 33 nM for the first and second bromodomain (BRD4(1/2)).

In vitro activity

In the present study, it was first noted that JQ1 can significantly affect the glycolytic metabolism of B-ALL cells by inhibiting glucose absorption and metabolic process and eventually causing the reduction of metabolic intermediates, such as lactate and ATP, which are the main materials and energy sources for cell synthesis. According to the results of RNA-seq, JQ1 suppressed the glycolytic process by inhibiting the expression of glycolysis key enzymes, including hexokinase 2, phosphofructokinase, and lactate dehydrogenase A. It was also found that the glycolysis inhibitor 2-DG blocked the cell cycle arrest of B-ALL cells induced by JQ1, suggesting JQ1 suppressed the proliferation of B-ALL by partially inhibiting glycolysis. JQ1 not only affected glycolysis, but also altered the mitochondrial oxidative phosphorylation metabolism of B-ALL cells, but the mechanism is unclear. As a BRD4-specific inhibitor, JQ1 can mediate the proliferation and apoptosis of a variety of tumor cells by c-Myc. In this study, the level of c-Myc decreased in B-ALL cells after JQ1 treatment. Because c-Myc plays an important part in cell metabolism, it was hypothesized that glycolysis repression mediated by JQ1 is due to the reduction of the c-Myc level. Then, this study carried out a rescue experiment by overexpressing c-Myc, and observed that the effect of JQ1 decreased, accompanied by the relief of cell cycle arrest and glycolysis, suggesting that the inhibited glycolysis and cell cycle arrest of JQ1 was mediated by c-Myc.

Reference: Med Sci Monit. 2020; 26: e923411-1–e923411-10. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7165247/

In vivo activity

To further validate findings, the anti-tumor effects of JQ1 were evaluated in vivo using a xenograft mouse model transplanted with HGC27 cells subcutaneously. Twelve mice were divided into two groups: the NC group and the JQ1-treating group. After 2 weeks of JQ1 treatment, it was observed that the volumes and weights of the tumors from the JQ1-treating group were significantly decreased compared with that in the NC group (Fig. 7a, b). However, there were no obvious differences regarding body weights of the mice between the two groups (Fig. 7c). Then, total protein and mRNA were extracted from the fresh tumors. WB analysis showed that the NID1 protein expression was significantly downregulated in JQ1-treating group compared with NC group (Fig. 7d). In addition, qRT-PCR results demonstrated a significant decrease in NID1 mRNA expression after JQ1 treatment (Fig. 7e). These findings indicated that JQ1 suppressed GC tumor proliferation via inhibiting NID1 signaling in vivo.

Reference: Oncogenesis. 2020 Mar; 9(3): 33. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7064486/