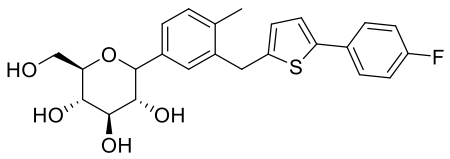
Product data sheet

MedKoo Cat#: 314203 Name: Canagliflozin CAS#: 842133-18-0 (free) Chemical Formula: $C_{24}H_{25}FO_5S$ Exact Mass: 444.14067 Molecular Weight: 444.52	
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:

Canagliflozin (INN, trade name Invokana) is a drug for the treatment of type 2 diabetes. It was developed by Mitsubishi Tanabe Pharma and is marketed under license by Janssen, a division of Johnson & Johnson. Canagliflozin is an inhibitor of subtype 2 sodium-glucose transport protein (SGLT2), which is responsible for at least 90% of the glucose reabsorption in the kidney. Blocking this transporter causes blood glucose to be eliminated through the urine. In March 2013, canagliflozin became the first SGLT2 inhibitor to be approved in the United States.

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	69.5	156.35

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	2.25 mL	11.25 mL	22.50 mL
5 mM	0.45 mL	2.25 mL	4.50 mL
10 mM	0.22 mL	1.12 mL	2.25 mL
50 mM	0.04 mL	0.22 mL	0.45 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. Zhao Y, Li Y, Liu Q, Tang Q, Zhang Z, Zhang J, Huang C, Huang H, Zhang G, Zhou J, Yan J, Xia Y, Zhang Z, He J. Canagliflozin Facilitates Reverse Cholesterol Transport Through Activation of AMPK/ABC Transporter Pathway. Drug Des Devel Ther. 2021 May 18;15:2117-2128. doi: 10.2147/DDDT.S306367. PMID: 34040350; PMCID: PMC8140894.
2. Papadopoli D, Uchenunu O, Palia R, Chekkal N, Hulea L, Topisirovic I, Pollak M, St-Pierre J. Perturbations of cancer cell metabolism by the antidiabetic drug canagliflozin. Neoplasia. 2021 Apr;23(4):391-399. doi: 10.1016/j.neo.2021.02.003. Epub 2021 Mar 27. PMID: 33784591; PMCID: PMC8027095.

In vivo study

1. Niu Y, Chen Y, Sun P, Wang Y, Luo J, Ding Y, Xie W. Intragastric and atomized administration of canagliflozin inhibit inflammatory cytokine storm in lipopolysaccharide-treated sepsis in mice: A potential COVID-19 treatment. Int Immunopharmacol. 2021 May 9;96:107773. doi: 10.1016/j.intimp.2021.107773. Epub ahead of print. PMID: 34020392; PMCID: PMC8106881.
2. Nishinarita R, Niwano S, Niwano H, Nakamura H, Saito D, Sato T, Matsuura G, Arakawa Y, Kobayashi S, Shirakawa Y, Horiguchi A, Ishizue N, Igarashi T, Yoshizawa T, Oikawa J, Hara Y, Katsumura T, Kishihara J, Satoh A, Fukaya H, Sakagami H, Ako J.

Product data sheet

Canagliflozin Suppresses Atrial Remodeling in a Canine Atrial Fibrillation Model. J Am Heart Assoc. 2021 Jan 19;10(2):e017483. doi: 10.1161/JAHA.119.017483. Epub 2021 Jan 5. PMID: 33399004; PMCID: PMC7955321.

7. Bioactivity

Biological target:

Canagliflozin (JNJ 28431754) is a selective SGLT2 inhibitor with IC50s of 2 nM, 3.7 nM, and 4.4 nM for mSGLT2, rSGLT2, and hSGLT2 in CHOK cells, respectively.

In vitro activity

To understand the mechanism of Cana (Canagliflozin) regulated Abcg5 and Abcg8 expression, this study explored the signaling pathway. Cana has been reported to activate AMPK in several cell lines. In hepG2 cells, Cana could directly activate AMPK and its downstream phosphorylation of ACC (Figure 4B). In Caco2 cells, AMPK was also activated by Cana treatment (Figure 4C). To confirm whether Cana regulated Abcg5 and Abcg8 was AMPK dependent, this study treated hepG2 and Caco2 cells with compound C, a pharmacological inhibitor of AMPK. Inhibition of AMPK pathway abolished Cana increased expression of Abcg5 and Abcg8 in both hepG2 and Caco2 cells (Figure 5A–F, Supplementary Figure 6A–F). Cana upregulated expressions of LXR in both hepG2 and Caco2 cells were also inhibited by Compound C (Supplementary Figure 6G and H). Taken together, Cana increased Abcg5 and Abcg8 expression via activating AMPK pathway.

Reference: Drug Des Devel Ther. 2021 May 18;15:2117-2128. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8140894/

In vivo activity

In this study, CAN (Canagliflozin) significantly improved acute lung injures induced by LPS (increased lung edema and lung capillary penetration) in mice. The pathological slice results also indicated this improvement. Immunohistochemistry analysis further indicated that CAN attenuated macrophage (identified by CD11b antibody) infiltration in lung tissues induced by LPS, which may be associated with the decreased chemotactic cytokines, for example, MCP-1 and MIP-2 in lung tissues of mice. In blood samples, CAN significantly reduced the inflammatory factors, which suggested that CAN had a systematic inhibition on immune cell activation in vivo after acute treatment. Although this study used CAN or DXM (Dexamethasone) only for 3 days, more COVID-19 patients may require longer administration of these anti-inflammatory drugs and a safety concern could be considered. In a preliminary experiment, chronic administration (about 3 months) of CAN (25 mg/kg) did not affect the spleen weight in mice compared with untreated controls, whereas 1-month administration of dexamethasone (2 mg/kg) significantly lowered the spleen weight in mice (supplemental Fig. 1) compared with untreated controls. These results indicated that CAN might not significantly affect immune organ development similar to glucocorticoids if patients required a long-term administration.

Reference: Int Immunopharmacol. 2021 Jul; 96: 107773. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8106881/