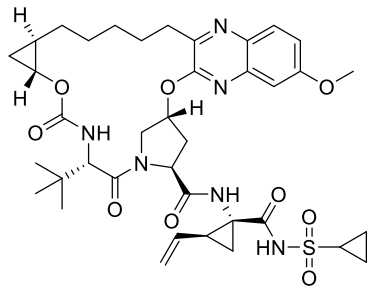
Product data sheet

MedKoo Cat#: 501205 Name: Grazoprevir (MK5172) CAS#: 1350514-68-9 (free) Chemical Formula: $C_{38}H_{50}N_6O_9S$ Exact Mass: 766.336 Molecular Weight: 766.911	
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:

Grazoprevir, also known as MK5172, is a drug approved for the treatment of hepatitis C. It was developed by Merck and completed Phase III trials, following promising results in Phase II when used in combination with the NS5A replication complex inhibitor elbasvir, either with or without ribavirin.Grazoprevir is a second generation hepatitis C virus protease inhibitor acting at the NS3/4a protease targets. It has good activity against a range of HCV genotype variants, including some that are resistant to most currently used antiviral medications.

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	58.33	76.06
DMF	30.0	39.12
DMF:PBS (pH 7.2) (1:4)	0.2	0.26
Ethanol	57.5	74.98

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	**1 mg**	**5 mg**	**10 mg**
1 mM	1.30 mL	6.52 mL	13.04 mL
5 mM	0.26 mL	1.30 mL	2.61 mL
10 mM	0.13 mL	0.65 mL	1.30 mL
50 mM	0.03 mL	0.13 mL	0.26 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. Soumana DI, Kurt Yilmaz N, Prachanronarong KL, Aydin C, Ali A, Schiffer CA. Structural and Thermodynamic Effects of Macrocyclization in HCV NS3/4A Inhibitor MK-5172. ACS Chem Biol. 2016 Apr 15;11(4):900-9. doi: 10.1021/acschembio.5b00647. Epub 2016 Jan 6. PMID: 26682473; PMCID: PMC5099976.

In vivo study

1. Summa V, Ludmerer SW, McCauley JA, Fandozzi C, Burlein C, Claudio G, Coleman PJ, Dimuzio JM, Ferrara M, Di Filippo M, Gates AT, Graham DJ, Harper S, Hazuda DJ, Huang Q, McHale C, Monteagudo E, Pucci V, Rowley M, Rudd MT, Soriano A, Stahlhut MW, Vacca JP, Olsen DB, Liverton NJ, Carroll SS. MK-5172, a selective inhibitor of hepatitis C virus NS3/4a protease with broad activity across genotypes and resistant variants. Antimicrob Agents Chemother. 2012 Aug;56(8):4161-7. doi:

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10.1128/AAC.00324-12. Epub 2012 May 21. Erratum in: Antimicrob Agents Chemother. 2014 Aug;58(8):4995. Huang, Qian [added]. PMID: 22615282; PMCID: PMC3421554.

7. Bioactivity

Biological target:

Grazoprevir (MK-5172) is a selective inhibitor of Hepatitis C virus NS3/4a protease with broad activity across genotypes and resistant variants, with Kis of 0.01 nM (gt1b), 0.01 nM (gt1a), 0.08 nM (gt2a), 0.15 nM (gt2b), 0.90 nM (gt3a), respectively.

In vitro activity

Unlike all other HCV PIs with known cocrystal structures, MK-5172 interacts with the catalytic triad in a unique conformation where the P2 quinoxaline moiety packs largely against the catalytic residues H57 and D81 (Figure 1). The P1–P4 peptidomimetic inhibitor scaffold spans the S1–S4 binding pockets interacting with the carbonyl oxygens of R155 and A157 as well as the Nε of A157. The P1′ acylsulfonamide is positioned in the oxyanion hole and hydrogen bonds to H57, G137, and S139. This binding mode is unchanged when the P2–P4 macrocycle is removed (5172-linear) or replaced with a P1–P3 macrocycle (5172-mcP1P3). Therefore, the binding mode of MK-5172 is a function of the P2 moiety rather than the macrocycle.

Reference: ACS Chem Biol. 2016 Apr 15; 11(4): 900–909. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5099976/

In vivo activity

To demonstrate in vivo efficacy, MK-5172 was administered orally to three chronically HCV-infected chimpanzees at a dose of 1 mg per kg twice daily for 7 days. Two of the chimpanzees had wild-type (WT) gt1a or gt1b infections with high viral titers (~106 IU/ml). A third chimpanzee had a modest viral titer (~104 IU/ml) that was gt1a NS3 R155K virus. This chimpanzee maintained a chronic R155K viral infection in the absence of prior experimental treatment with an HCV small molecule inhibitor (J. Fontenot, personal communication). Pharmacodynamic responses to MK-5172 are shown in Fig. 4A.

Reference: Antimicrob Agents Chemother. 2012 Aug; 56(8): 4161–4167. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3421554/