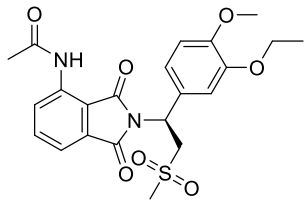
Product data sheet

MedKoo Cat#: 205894 Name: Apremilast CAS#: 608141-41-9 Chemical Formula: $C_{22}H_{24}N_2O_7S$ Exact Mass: 460.13042 Molecular Weight: 460.5	
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:

Apremilast, also known as CC-10004, is a thalidomide analog and is an orally available small molecule inhibitor of phosphodiesterase 4 (PDE4). Apremilast specifically inhibits PDE4 and inhibits spontaneous production of TNF-alpha from human rheumatoid synovial cells. It has anti-inflammatory activity. Apremilast was approved by the USFDA in March 2014 for treatment of adults with active psoriatic arthritis. It is also being tested for its efficacy in treating other chronic inflammatory diseases such as ankylosing spondylitis, Behcet's disease, and rheumatoid arthritis.

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	48.67	105.69
Ethanol	3.0	6.51
DMF	20.0	43.43
DMF:PBS (pH 7.2) (1:1)	0.5	1.09

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	**1 mg**	**5 mg**	**10 mg**
1 mM	2.17 mL	10.86 mL	21.72 mL
5 mM	0.43 mL	2.17 mL	4.34 mL
10 mM	0.22 mL	1.09 mL	2.17 mL
50 mM	0.04 mL	0.22 mL	0.43 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. Wang H, Yang G, Zhang Q, Liang X, Liu Y, Gao M, Guo Y, Chen L. Apremilast ameliorates ox-LDL-induced endothelial dysfunction mediated by KLF6. Aging (Albany NY). 2020 Oct 14;12(19):19012-19021. doi: 10.18632/aging.103665. Epub ahead of print. PMID: 33052879; PMCID: PMC7732304.
2. Kragstrup TW, Adams M, Lomholt S, Nielsen MA, Heftdal LD, Schafer P, Deleuran B. IL-12/IL-23p40 identified as a downstream target of apremilast in ex vivo models of arthritis. Ther Adv Musculoskelet Dis. 2019 Feb 22;11:1759720X19828669. doi: 10.1177/1759720X19828669. PMID: 30833991; PMCID: PMC6391542.

In vivo study

Product data sheet

1. Schafer PH, Adams M, Horan G, Truzzi F, Marconi A, Pincelli C. Apremilast Normalizes Gene Expression of Inflammatory Mediators in Human Keratinocytes and Reduces Antigen-Induced Atopic Dermatitis in Mice. Drugs R D. 2019 Dec;19(4):329-338. doi: 10.1007/s40268-019-00284-1. PMID: 31598889; PMCID: PMC6890576.
2. Perez-Aso M, Montesinos MC, Mediero A, Wilder T, Schafer PH, Cronstein B. Apremilast, a novel phosphodiesterase 4 (PDE4) inhibitor, regulates inflammation through multiple cAMP downstream effectors. Arthritis Res Ther. 2015 Sep 15;17(1):249. doi: 10.1186/s13075-015-0771-6. PMID: 26370839; PMCID: PMC4570588.

7. Bioactivity

Biological target:

Apremilast (CC-10004) is an inhibitor of type-4 cyclic nucleotide phosphodiesterase (PDE-4) with an IC50 of 74 nM. Apremilast inhibits TNF-α release by lipopolysaccharide (LPS) with an IC50 of 104 nM.

In vitro activity

Here, apremilast significantly decreased the expression of LOX-1, suggesting an inhibitory effect against foam cell formation. Proinflammatory cytokines are a major effector of atherogenesis. Inhibition of PDE4 by drugs including apremilast is known to suppress the expression of TNF-α. Apremilast has been shown to inhibit the expression of these three cytokines. Here, apremilast significantly decreased ox-LDL-induced TNF-α, IL-6, and IL-8 expression, however, whether these pathways were involved remains unclear.

Reference: Aging (Albany NY). 2020 Oct 15; 12(19): 19012–19021. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7732304/

In vivo activity

Apremilast (2.5 and 5 mg/kg twice daily) significantly reduced ear swelling in two models of dermatitis (Fig. 3). In the FITC model, ear thickness significantly ($P < 0.05$) increased from 0.19 ± 0.00 mm (baseline) to 0.50 ± 0.02 mm (day 13) in vehicle-treated mice. Dexamethasone 1 mg/kg significantly reduced ear thickness to 0.34 ± 0.01 mm on days 11–13 compared with vehicle-treated mice ($P < 0.05$). Similarly, apremilast 2.5 and 5 mg/kg significantly reduced ear thickness to 0.40 ± 0.01 mm and 0.41 ± 0.01 mm, respectively, on days 11–13 compared with vehicle-treated mice ($P < 0.05$). MCP-1 protein levels in the inflamed ear were 184.21 ± 32.54 pg/mg in vehicle-treated mice. Apremilast significantly reduced MCP-1 protein levels to 87.58 ± 18.04 pg/mg compared with vehicle ($P < 0.05$). There were trends toward a decrease by apremilast of IL-4, IL-10, IL-13, IL-17A, and IL-12/23p40 protein levels in the inflamed ears (Fig. 4).

Reference: Drugs R D. 2019 Dec; 19(4): 329–338. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6890576/

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.