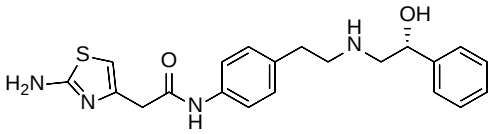
Product data sheet

MedKoo Cat#: 314233 Name: Mirabegron CAS: 223673-61-8 Chemical Formula: $C_{21}H_{24}N_4O_2S$ Exact Mass: 396.162 Molecular Weight: 396.509	
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:
Mirabegron (formerly YM-178, trade name Myrbetriq) is a drug for the treatment of overactive bladder. It was developed by Astellas Pharma and was approved in the United States in July 2012. Mirabegron activates the β3 adrenergic receptor in the detrusor muscle in the bladder, which leads to muscle relaxation and an increase in bladder capacity. (Source: http://en.wikipedia.org/wiki/Mirabegron)

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
DMF	5.0	12.61
DMSO	55.91	141.01
DMSO:PBS (pH 7.2) (1:6)	0.1	0.25
Ethanol	6.31	15.91

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	2.52 mL	12.61 mL	25.22 mL
5 mM	0.50 mL	2.52 mL	5.04 mL
10 mM	0.25 mL	1.26 mL	2.52 mL
50 mM	0.05 mL	0.25 mL	0.50 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. Takusagawa S, Miyashita A, Iwatsubo T, Usui T. In vitro inhibition and induction of human cytochrome P450 enzymes by mirabegron, a potent and selective β3-adrenoceptor agonist. Xenobiotica. 2012 Dec;42(12):1187-96. doi: 10.3109/00498254.2012.700140. Epub 2012 Jul 27. PMID: 22834478.
2. Aizawa N, Homma Y, Igawa Y. Effects of mirabegron, a novel β3-adrenoceptor agonist, on primary bladder afferent activity and bladder microcontractions in rats compared with the effects of oxybutynin. Eur Urol. 2012 Dec;62(6):1165-73. doi: 10.1016/j.eururo.2012.08.056. Epub 2012 Sep 5. PMID: 22981677.

In vivo study

1. Sui W, Li H, Yang Y, Jing X, Xue F, Cheng J, Dong M, Zhang M, Pan H, Chen Y, Zhang Y, Zhou Q, Shi W, Wang X, Zhang H, Zhang C, Zhang Y, Cao Y. Bladder drug mirabegron exacerbates atherosclerosis through activation of brown fat-mediated lipolysis. Proc Natl Acad Sci U S A. 2019 May 28;116(22):10937-10942. doi: 10.1073/pnas.1901655116. Epub 2019 May 13. PMID: 31085638; PMCID: PMC6561204.

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2. Hatanaka T, Ukai M, Watanabe M, Someya A, Ohtake A, Suzuki M, Ueshima K, Sato S, Kaku S. Effect of mirabegron, a novel β3-adrenoceptor agonist, on bladder function during storage phase in rats. Naunyn Schmiedebergs Arch Pharmacol. 2013 Jan;386(1):71-8. doi: 10.1007/s00210-012-0814-3. Epub 2012 Dec 9. PMID: 23224420.

7. Bioactivity

Biological target:

Mirabegron is a selective β3-adrenoceptor agonist with EC_{50} of 22.4 nM.

In vitro activity

Mirabegron was shown to be a time-dependent inhibitor of CYP2D6 in the presence of NADPH as the IC(50) value in human liver microsomes decreased from 13 to 4.3 μM after 30-min pre-incubation. Further evaluation indicated that mirabegron may act partly as an irreversible or quasi-irreversible metabolism-dependent inhibitor of CYP2D6.

Reference: Xenobiotica. 2012 Dec;42(12):1187-96. https://pubmed.ncbi.nlm.nih.gov/22834478/

In vivo activity

In apolipoprotein $E^{-/-}$ (*ApoE*$^{-/-}$) and low-density lipoprotein (LDL) receptor$^{-/-}$ (*Ldlr*$^{-/-}$) mice, oral administration of clinically relevant doses of mirabegron markedly accelerates atherosclerotic plaque growth and instability by a mechanism of increasing plasma levels of both LDL-cholesterol and very LDL-cholesterol remnants. Stimulation of atherosclerotic plaque development by mirabegron is dependent on thermogenesis-triggered lipolysis.

Reference: Proc Natl Acad Sci U S A. 2019 May 28;116(22):10937-10942. https://pubmed.ncbi.nlm.nih.gov/31085638/

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.