# **Product data sheet**



MedKoo Cat#: 315283				
Name: Bethanechol Chloride				
CAS#: 590-63-6				
Chemical Formula: C7H17ClN2O2				
Molecular Weight: 196.68				
Product supplied as:	Powder			
Purity (by HPLC):	$\geq$ 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:

Bethanechol chloride, a cholinergic agent, is a synthetic esler which is structurally and pharmacologically related to acetylcholine. It is designated chemically as Z-[(aminocarbony) oxy]-N, N, (V-trimethyl-1-propanaminium chloride. It is a white, hygroscopic crystalline powder having a slight amine-like odor, freely soluble in water, and has a molecular weight of 196.68. Each tablet for oral administration contains 5 mg, 10 mg, 25 mg or 50 mg bethanechol chloride, USP Tablets also contain the following inactive ingredients: colloidal silicon dioxide, lactose monohydrate, magnesium stearate, microcrystalline cellulose, sodium starch glycolate, (25 mg and 50 mg) D&C~ Yellow # 10 Lake and FD&C Yellow # 6 Lake.

## 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	16.71	84.96		
Ethanol	39.0	198.29		
Water	44.50	226.26		
PBS (pH 7.2)	5.0	25.42		

## 4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	5.08 mL	25.42 mL	50.84 mL
5 mM	1.02 mL	5.08 mL	10.17 mL
10 mM	0.51 mL	2.54 mL	5.08 mL
50 mM	0.10 mL	0.51 mL	1.02 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. Ito Y, Kaji M, Sakamoto E, Terauchi Y. The beneficial effects of a muscarinic agonist on pancreatic  $\beta$ -cells. Sci Rep. 2019 Nov 7;9(1):16180. doi: 10.1038/s41598-019-52691-8. PMID: 31700039; PMCID: PMC6838462.

#### In vivo study

1. Ito Y, Kaji M, Sakamoto E, Terauchi Y. The beneficial effects of a muscarinic agonist on pancreatic  $\beta$ -cells. Sci Rep. 2019 Nov 7;9(1):16180. doi: 10.1038/s41598-019-52691-8. PMID: 31700039; PMCID: PMC6838462.

### 7. Bioactivity

Biological target:

Bethanechol chloride is a mAChR agonist.

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In vitro activity

To determine whether bethanechol has a direct effect on pancreatic  $\beta$  cells, BrdU incorporation was investigated in the pancreatic  $\beta$ cell line MIN6. BrdU incorporation increased significantly in the bethanechol-treated cells in a concentration-dependent manner (Fig. 4A,B). This increase was suppressed completely by the addition of atropine 50  $\mu$ M (Fig. 4C). The Akt inhibitor perifosine (5  $\mu$ M) inhibited the bethanechol (1 mM)-induced incorporation of BrdU (Fig. 4D), whereas the mitogen-activated protein kinase (MEK) inhibitor PD98059 (50  $\mu$ M) did not (Fig. 4E).

Reference: Sci Rep. 2019 Nov 7;9(1):16180. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6838462/

#### In vivo activity

To examine the effect of bethanechol in a mouse model of diabetes, it was administered to IRS-2–/– mice, which show insulin resistance and high glucose levels. Bethanechol ( $2 \mu g/g$ ) was injected subcutaneously 15 min prior to oral glucose loading in wild-type mice and IRS-2–/– mice. Bethanechol increased insulin secretion and improved glucose tolerance in both types of mice (Fig. 1A). The bethanechol-induced secretion of insulin in the IRS-2–/– mice was higher than that in the wild-type mice (Fig. 1B). The results of the insulin tolerance test revealed no significant difference in glucose levels between the control and bethanechol groups of wild-type mice; however, 30 min following insulin injection, the glucose level in the bethanechol-injected IRS-2–/– mice was significantly lower than that in the control mice (Fig. 1C).

Reference: Sci Rep. 2019 Nov 7;9(1):16180. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6838462/

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.