# **Product data sheet**



MedKoo Cat#: 574836				
Name: Ouabain octahydrate				
CAS: 11018-89-6				
Chemical Formula: $C_{29}H_{60}O_{20}$				
Exact Mass: 728.3678				
Molecular Weight: 728.779				
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:

Ouabain octahydrate is a steroid hormone that inhibits Na(+)/K(+) ATPase, regulates transcription of MDR (increase, Pgp) and MRP (increase MRP1 and decrease CFTR, cyctic fibrosis transport receptor or cAMP-activated Cl- channel) genes, and also alters localization of MRP1.

# 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	125.0	171.52
Water	10.0	13.72

# 4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	1.37 mL	6.86 mL	13.72 mL
5 mM	0.27 mL	1.37 mL	2.74 mL
10 mM	0.14 mL	0.69 mL	1.37 mL
50 mM	0.03 mL	0.14 mL	0.27 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. Venugopal J, McDermott J, Sanchez G, Sharma M, Barbosa L, Reif GA, Wallace DP, Blanco G. Ouabain promotes partial epithelial to mesenchymal transition (EMT) changes in human autosomal dominant polycystic kidney disease (ADPKD) cells. Exp Cell Res. 2017 Jun 15;355(2):142-152. doi: 10.1016/j.yexcr.2017.04.001. Epub 2017 Apr 3. PMID: 28385574; PMCID: PMC5497755.

2. Meng L, Wen Y, Zhou M, Li J, Wang T, Xu P, Ouyang J. Ouabain induces apoptosis and autophagy in Burkitt's lymphoma Raji cells. Biomed Pharmacother. 2016 Dec;84:1841-1848. doi: 10.1016/j.biopha.2016.10.114. Epub 2016 Nov 25. PMID: 27894666.

#### In vivo study

 Kobayashi M, Usui-Kawanishi F, Karasawa T, Kimura H, Watanabe S, Mise N, Kayama F, Kasahara T, Hasebe N, Takahashi M. The cardiac glycoside ouabain activates NLRP3 inflammasomes and promotes cardiac inflammation and dysfunction. PLoS One. 2017 May 11;12(5):e0176676. doi: 10.1371/journal.pone.0176676. PMID: 28493895; PMCID: PMC5426608.
Lima DB, Valente RC, Capella MA. Ouabain-induced alterations in ABCB1 of mesenteric lymph nodes and thymocytes of rats and mice. Oncol Lett. 2016 Dec;12(6):5275-5280. doi: 10.3892/ol.2016.5366. Epub 2016 Nov 8. PMID: 28105236; PMCID: PMC5228555.

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# 7. Bioactivity

# Biological target:

Ouabain Octahydrate is an inhibitor of Na<sup>+</sup>/K<sup>+</sup>-ATPase, used for the treatment of congestive heart failure.

# In vitro activity

This study determined whether physiological concentrations of ouabain induces EMT in human renal epithelial cells from patients with ADPKD. This study found that ADPKD cells respond to ouabain with a decrease in expression of the epithelial marker E-cadherin and increase in the expression of the mesenchymal markers N-cadherin,  $\alpha$  smooth muscle actin ( $\alpha$ SMA) and collagen-I; and the tight junction protein occludin and claudin-1. Other adhesion molecules, such as ZO-1,  $\beta$ -catenin and vinculin were not significantly modified by ouabain. At the cellular level, ouabain stimulated ADPKD cell migration, reduced cell-cell interaction, and the ability of ADPKD cells to form aggregates. Moreover, ouabain increased the transepithelial electrical resistance of ADPKD cell monolayers, suggesting that the paracellular transport pathway was preserved in the cells.

Reference: Exp Cell Res. 2017 Jun 15;355(2):142-152. https://pubmed.ncbi.nlm.nih.gov/28385574/

### In vivo activity

Therefore, the present study investigated alterations in the expression and activity of ABCB1 in the thymi, peripheral blood monocytes and lymph nodes of Wistar rats and Swiss mice treated acutely or chronically with ouabain. A decrease of almost 45% in the monocyte count and an increase of 55% in the basophil count were observed. A significant decrease (75% reduction) in the amount of cells with ABCB1 activity was found in the thymocytes of ouabain-treated rats and mice.

Reference: Oncol Lett. 2016 Dec;12(6):5275-5280. https://pubmed.ncbi.nlm.nih.gov/28105236/

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.