

# Product data sheet



MedKoo Cat#: 591740 Name: Palmitic acid CAS: 57-10-3 Chemical Formula: C <sub>16</sub> H <sub>32</sub> O <sub>2</sub> Exact Mass: 256.2402 Molecular Weight: 256.43	
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:

Palmitic acid, or hexadecanoic acid in IUPAC nomenclature, is the most common saturated fatty acid found in animals, plants and microorganisms.

## 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	20.0	77.99
DMSO	57.0	222.28
Ethanol	60.33	235.28
Ethanol:PBS (pH 7.2) (1:2)	0.25	0.97

## 4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	3.90 mL	19.50 mL	39.00 mL
5 mM	0.78 mL	3.90 mL	7.80 mL
10 mM	0.39 mL	1.95 mL	3.90 mL
50 mM	0.08 mL	0.39 mL	0.78 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

- Nicholas DA, Zhang K, Hung C, Glasgow S, Aruni AW, Unternaehrer J, Payne KJ, Langridge WHR, De Leon M. Palmitic acid is a toll-like receptor 4 ligand that induces human dendritic cell secretion of IL-1 $\beta$ . PLoS One. 2017 May 2;12(5):e0176793. doi: 10.1371/journal.pone.0176793. PMID: 28463985; PMCID: PMC5413048.
- Liang H, Zhong Y, Zhou S, Li QQ. Palmitic acid-induced apoptosis in pancreatic  $\beta$ -cells is increased by liver X receptor agonist and attenuated by eicosapentaenoate. In Vivo. 2011 Sep-Oct;25(5):711-8. PMID: 21753123.

### In vivo study

- Moon ML, Joesting JJ, Lawson MA, Chiu GS, Blevins NA, Kwakwa KA, Freund GG. The saturated fatty acid, palmitic acid, induces anxiety-like behavior in mice. Metabolism. 2014 Sep;63(9):1131-40. doi: 10.1016/j.metabol.2014.06.002. Epub 2014 Jun 9. PMID: 25016520; PMCID: PMC4151238.
- Harada H, Yamashita U, Kurihara H, Fukushi E, Kawabata J, Kamei Y. Antitumor activity of palmitic acid found as a selective cytotoxic substance in a marine red alga. Anticancer Res. 2002 Sep-Oct;22(5):2587-90. PMID: 12529968.

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## 7. Bioactivity

### Biological target:

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PA (palmitic acid) can induce the expression of glucose-regulated protein 78 (GRP78) and CCAAT/enhancer binding protein homologous protein (CHOP) in mouse granulosa cells.

### In vitro activity

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PA (palmitic acid) functions as a ligand for TLR4 on human monocyte derived dendritic cells (MoDCs). Treatment of human MoDCs with PA resulted in endocytosis of TLR4, further supporting the function of PA as a TLR4 agonist. In addition, PA stimulated DC maturation and activation based on the upregulation of DC costimulatory factors CD86 and CD83. Further experiments showed that PA induced TLR4 dependent secretion of the pro-inflammatory cytokine IL-1 $\beta$ . Lastly, the experimental data show that PA stimulation of NF- $\kappa$ B canonical pathway activation is regulated by TLR4 signaling and that reactive oxygen species may be important in upregulating this pro-inflammatory response.

Reference: PLoS One. 2017 May 2;12(5):e0176793. <https://pubmed.ncbi.nlm.nih.gov/28463985/>

### In vivo activity

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In a dose-dependent fashion, palmitic acid rapidly reduced mouse locomotor activity by a mechanism that did not rely on TLR4, MyD88, IL-1, IL-6 or TNF $\alpha$  but was dependent on fatty acid chain length. Twenty-four hours after palmitic acid administration mice exhibited anxiety-like behavior without impairment in locomotion, food intake, depressive-like behavior or spatial memory. Additionally, the serotonin metabolite 5-HIAA was increased by 33% in the amygdala 24h after palmitic acid treatment.

Reference: Metabolism. 2014 Sep;63(9):1131-40. <https://pubmed.ncbi.nlm.nih.gov/25016520/>

*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.*