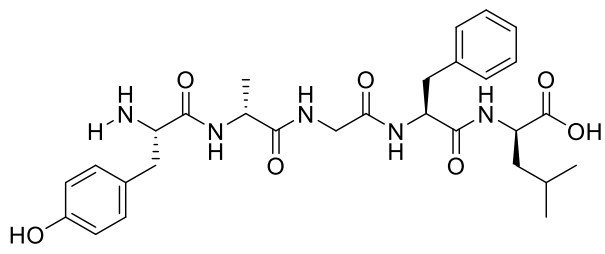


# Product data sheet



MedKoo Cat#: 574348 Name: DADLE CAS#: 63631-40-3 Chemical Formula: C <sub>29</sub> H <sub>39</sub> N <sub>5</sub> O <sub>7</sub> Exact Mass: 569.2849 Molecular Weight: 569.66	
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:

DADLE is a prototypical  $\delta$ -opioid receptor agonist that displays activity at the  $\mu$ -opioid receptor and antinociceptive activity in vivo.

## 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	25.0	43.89
DMF	25.0	43.89

## 4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	1.76 mL	8.78 mL	17.55 mL
5 mM	0.35 mL	1.76 mL	3.51 mL
10 mM	0.18 mL	0.88 mL	1.76 mL
50 mM	0.04 mL	0.18 mL	0.35 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 S, Cao X, Duan Y, Zhang G. Delta Opioid Peptide [d-Ala2, d-Leu5] Enkephalin (DADLE) Exerts a Cytoprotective Effect in Astrocytes Exposed to Oxygen-Glucose Deprivation by Inducing Autophagy. *Cell Transplant*. 2019 Jun;28(6):775-782. doi: 10.1177/0963689719825619. Epub 2019 Jan 22. PMID: 30666890; PMCID: PMC6686437.
2. Zhu M, Liu M, Guo QL, Zhu CQ, Guo JC. Prolonged DADLE exposure epigenetically promotes Bcl-2 expression and elicits neuroprotection in primary rat cortical neurons via the PI3K/Akt/NF- $\kappa$ B pathway. *Acta Pharmacol Sin*. 2018 Oct;39(10):1582-1589. doi: 10.1038/aps.2018.7. Epub 2018 May 24. PMID: 29795362; PMCID: PMC6289365.

### In vivo study

1. Lai Z, Gu L, Yu L, Chen H, Yu Z, Zhang C, Xu X, Zhang M, Zhang M, Ma M, Zhao Z, Zhang J. Delta opioid peptide [d-Ala2, d-Leu5] enkephalin confers neuroprotection by activating delta opioid receptor-AMPK-autophagy axis against global ischemia. *Cell Biosci*. 2020 Jun 15;10:79. doi: 10.1186/s13578-020-00441-z. PMID: 32549974; PMCID: PMC7294676.
2. Wang S, Duan Y, Su D, Li W, Tan J, Yang D, Wang W, Zhao Z, Wang X. Delta opioid peptide [D-Ala2, D-Leu5] enkephalin (DADLE) triggers postconditioning against transient forebrain ischemia. *Eur J Pharmacol*. 2011 May 11;658(2-3):140-4. doi: 10.1016/j.ejphar.2011.02.006. Epub 2011 Feb 22. PMID: 21349267.

# Product data sheet



## 7. Bioactivity

### Biological target:

DADLE is a peptide agonist of  $\delta$ -opioid receptors ( $K_i = 2.06$  nM in a radioligand binding assay) that is selective for  $\delta$ -opioid over  $\kappa$ -opioid receptors ( $K_i = 16,000$  nM) but also agonizes  $\mu$ -opioid receptors ( $K_i = 13.8$  nM).

### In vitro activity

This study showed that DOR stimulation with DADLE ( $0.1 \mu\text{mol/L}$ ) for 2 d selectively activates the PI3K/Akt/NF- $\kappa$ B pathway in NaN3-treated neurons; this activation increased Bcl-2 expression, attenuated Cyto c release and promoted neuronal survival. Further investigation revealed that sustained DADLE stimulation increased Bcl-2 expression by enhancing NF- $\kappa$ B binding to the Bcl-2 promoter and upregulating the histone acetylation levels of the Bcl-2 promoter. The results demonstrate that prolonged DADLE exposure epigenetically promotes Bcl-2 expression and elicits neuroprotective effects in the NaN3 model via the PI3K/Akt/NF- $\kappa$ B pathway.

Reference: Acta Pharmacol Sin. 2018 Oct; 39(10): 1582–1589. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6289365/>

### In vivo activity

DADLE postconditioning protection of hippocampal CA1 neurons against transient forebrain ischemia was tested. 6 days after being implanted with cannula at the right lateral ventricle, rats underwent 10 min of forebrain ischemia by four vessel occlusion. The results showed that DADLE at doses of 0.25 and 2.5 nmol, but not 25 nmol, could significantly protect CA1 neurons against ischemia/reperfusion injury. Furthermore, DADLE postconditioning exhibited cognitive benefits in rats with transient forebrain ischemia. The study thus suggested a therapeutic opportunity of postconditioning neuroprotection by DADLE and also provided important information in understanding the mechanism of DADLE action in the ischemic brain.

Reference: Eur J Pharmacol. 2011 May 11;658(2-3):140-4. <https://pubmed.ncbi.nlm.nih.gov/21349267/>

*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.*