Muramyl dipeptide (MDP)

Catalog No.C14430 Batch:C1443003

Product Datasheet

Technical Data

Formula	$C_{19}H_{32}N_4O_{11}$					
Molecular Weight	492.48	**CAS No.**	53678-77-6			
Solubility (25°C)*	In vitro	DMSO	98 mg/mL (198.99 mM)			
		Water	98 mg/mL (198.99 mM)			
		Ethanol	Insoluble			
	In vivo (Add solvents to the product individually and in order)	Oral Administration	Homogeneous suspension	CMC-NA	≥5mg/ml	Taking the 1 mL working solution as an example, add 5 mg of this product to 1 ml of CMC-Na solution, mix evenly to obtain a homogeneous suspension with a final concentration of 5 mg/ml.
		Injection	Clear solution	5%DMSO [1] → 40%PEG300 [2] → 5%Tween80 [3] → 50%ddH2O Validated by Capsid Bio labs. Should you need adjustments to this formulation, contact our sales team for custom testing.	4.900mg/ml (9.95mM)	Taking the 1 mL working solution as an example, add 50 μL of 98 mg/ml clarified DMSO stock solution to 400 μL of PEG300, mix evenly to clarify it; add 50 μL of Tween80 to the above system, mix evenly to clarify; then continue to add 500 μL of ddH2O to adjust the volume to 1 mL. The mixed solution should be used immediately for optimal results.
			Clear solution	5% DMSO [1] → 95% Corn oil Validated by Capsid Bio labs. Should you need adjustments to this formulation, contact our sales team for custom testing.	1.225mg/ml (2.49mM)	Taking the 1 mL working solution as an example, add 50 μL of 24.5 mg/ml clear DMSO stock solution to 950 μL of corn oil and mix evenly. The mixed solution should be used immediately for optimal results.

* <1 mg/ml means slightly soluble or insoluble.
* Please note that Capsid Bio tests the solubility of all compounds in-house, and the actual solubility may differ slightly from published values. This is normal and is due to slight batch-to-batch variations.
* Room temperature shipping (Stability testing shows this product can be shipped at 2-8°C for storage purposes.)

Preparing Stock Solutions

Biological Activity

Description	Muramyl dipeptide (MDP), a shared structural unit of peptidoglycans, is an inducer of **bone formation** through the induction of **Runx2**.
Targets	Runx2 [1]
In vitro	Muramyl dipeptide (MDP) directly augments osteoblast differentiation and bone-forming gene expression by Runx2 activation. Despite no direct effect, it indirectly attenuates osteoclast differentiation through down-regulation of the RANKL/OPG ratio. This compound increases the expression of its receptor, Nod2, and MDP-induced bone formation and osteoblast activation does not occur during Nod2-deficiency.[1]
In vivo	In mice administered with Muramyl dipeptide (MDP), increased bone and mineral density by enhanced bone formation are observed. Remarkably, pre-treatment or post-treatment with this compound alleviates bone loss in RANKL-induced osteoporosis mouse models.[1]

Protocol (from reference)

Cell Assay:[1]

- **Cell lines**
  MC3T3-E1 cells, BMSCs, or primary osteoblast precursors from mouse calvaria
- **Concentrations**
  0.1 μg/ml, 1 μg/ml, 10 μg/ml
- **Incubation Time**
  2 days
- **Method**
  MC3T3-E1 cells, BMSCs, or primary osteoblast precursors from mouse calvaria are plated onto 48-well plates at 2×10^4 cells/400 μl/well and incubated with osteoblast induction medium in the absence or presence of Muramyl dipeptide (MDP). Half of the medium is replaced with fresh osteoblast induction medium every 2 days. At day 6 and 12, the cells are stained with ALP for osteoblast differentiation and with alizarin red S for bone mineralization, respectively.

Animal Study:[1]

- **Animal Models**
  Five-week-old C57BL/6 mice, one-day-old neonatal mice, B6.129S1-Nod2^{tm1Flv}/J mice
- **Dosages**
  1.25 mg/kg
- **Administration**
  IP

References

https://pubmed.ncbi.nlm.nih.gov/28337794/

RETURN POLICY

Capsid Bio's Unconditional Return Policy ensures a smooth online shopping experience for our customers. If you are in any way unsatisfied with your purchase, you may return any item(s) within 7 days of receiving it. In the event of product quality issues, either protocol related or product related problems, you may return any item(s) within 365 days from the original purchase date. Please follow the instructions below when returning products.

SHIPPING & STORAGE

Capsid Bio products are transported at room temperature. If you receive the product at room temperature, please rest assured, the Capsid Bio Quality Inspection Department has conducted experiments to verify that the normal temperature placement of one month will not affect the biological activity of powder products. After collecting, please store the product according to the requirements described in the datasheet. Most Capsid Bio products are stable under the recommended conditions.

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