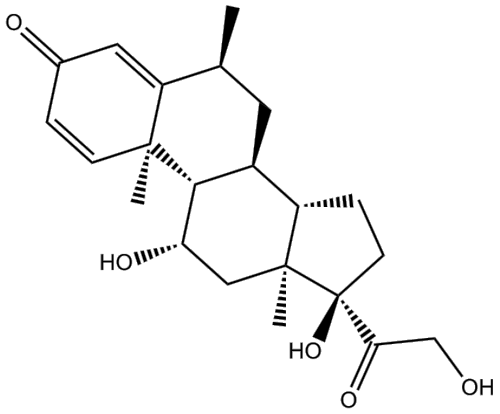
Product Data Sheet

Product Name: Methylprednisolone
Cat. No.: GC15505

Chemical Properties

Cas. No.	83-43-2		
Chemical Name	(6S,8S,9S,10R,11S,13S,14S,17R)-11,17-dihydroxy-17-(2-hydroxyacetyl)-6,10,13-trimethyl-7,8,9,11,12,14,15,16-octahydro-6H-cyclopenta[a]phenanthren-3-one		
SMILES	CC1CC2C3CCC(C3(CC(C2C4(C1=CC(=O)C=C4)C)O)C)(C(=O)CO)O		
Formula	$C_{22}H_{30}O_5$	M.Wt	374.48
Solubility	≥ 15.35 mg/mL in DMSO, ≥ 9.5 mg/mL in EtOH with ultrasonic	Storage	4°C, protect from light
General tips	For obtaining a higher solubility , please warm the tube at 37 °C and shake it in the ultrasonic bath for a while.Stock solution can be stored below -20°C for several months.		
Shipping Condition	Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request.		

Structure



Protocol

Product Data Sheet

Cell experiment [1]:

Cell lines	Human oligodendroglioma cell HOG
Preparation Method	HOG cells were cultured in Dulbecco's Modified Eagle's Medium at 37 °C with 5% CO2. After 24 hours of cell incubation, the medium was changed to a medium containing different doses (0.5μM, 5μM, 30μM, or 50μM) of methylprednisolone for 3, 5, and 10 days.
Reaction Conditions	0.5μM, 5μM, 30μM, or 50μM methylprednisolone for 3, 5, and 10 days
Applications	Methylprednisolone reduced the proliferation of HOG cells by reducing cell viability in a dose-dependent manner. HOG's death was also enhanced by methylprednisolone. In addition, methylprednisolone reduced the expression of the mature oligodendrocyte marker MBP at an early stage and inhibited myelin regeneration

Animal experiment [2]:

Animal models	6-week-old male C57/BL6 mice (weight 18-22 g)
Preparation Method	Methylprednisolone was dissolved in saline. Mice were intragastrically administrated with methylprednisolone (25mg/kg) for 2-14 days.
Dosage form	25mg/kg, intragastrically administration

Product Data Sheet

Applications	Methylprednisolone alleviated cognitive dysfunctions and inhibited the excessive activation of microglia in Aβ1-42-induced mice. Synaptic function-related genes were upregulated by Methylprednisolone, whereas immune response-related genes were suppressed by Methylprednisolone.

References:

[1]. GÓmez-Pinedo U, MatÍas-Guiu JA, Ojeda-Hernandez D, de la Fuente-Martin S, Kamal OM, Benito-Martin MS, Selma-Calvo B, Montero-Escribano P, MatÍas-Guiu J. In Vitro Effects of Methylprednisolone over Oligodendroglial Cells: Foresight to Future Cell Therapies. Cells. 2023 May 30;12(11):1515. doi: 10.3390/cells12111515. PMID: 37296635; PMCID: PMC10252523.
[2]. Sun Y, Li J, A N, Li Z, Zhong W, Chen L, Liu S, Zhang B, Zhu Z, Li X. Methylprednisolone alleviates cognitive functions through the regulation of neuroinflammation in Alzheimer's disease. Front Immunol. 2023 May 1;14:1192940. doi: 10.3389/fimmu.2023.1192940. PMID: 37197654; PMCID: PMC10183590.

Background

Methylprednisolone is a corticosteroid that interacts with the glucocorticoid receptor and inhibits cortisol secretion with an IC50 of 1.7ng/ml [1]. Methylprednisolone exerts anti-inflammatory effects by inhibiting NF-kappaB and can be utilized in the treatment of tuberculosis and COVID-19 [2].

Methylprednisolone (0.5μM, 5μM, 30μM, or 50μM) could reduce HOG cell proliferation and promote HOG death in a dose-dependent manner. Methylprednisolone also decreased the expression of MBP, a marker for early mature oligodendrocytes, and inhibited myelin regeneration [3].

Methylprednisolone (25mg/kg) treatment significantly ameliorated l Aβ1-42-induced cognitive deficits in Alzheimer's disease mice as well as reduced microglia hyperactivation. Synaptic function-related genes could be upregulated by Methylprednisolone, while immune response-related genes were suppressed by Methylprednisolone. Methylprednisolone alleviated cognitive dysfunction by improving synaptic function and suppressing immune and inflammatory processes [4].

References:
[1]. Lew KH, Ludwig EA, Milad MA, Donovan K, Middleton E Jr, Ferry JJ, Jusko WJ. Gender-based

effects on methylprednisolone pharmacokinetics and pharmacodynamics. Clin Pharmacol Ther. 1993 Oct;54(4):402-14. doi: 10.1038/clpt.1993.167. PMID: 8222483; PMCID: PMC4207261.

[2]. Li A, He Y, Yang C, Lu N, Bao J, Gao S, Hosyanto FF, He X, Fu H, Yan H, Ding N, Xu L. Methylprednisolone Promotes Mycobacterium smegmatis Survival in Macrophages through NF-κB/DUSP1 Pathway. Microorganisms. 2023 Mar 16;11(3):768. doi: 10.3390/microorganisms11030768. PMID: 36985341; PMCID: PMC10058212.

[3]. GÓmez-Pinedo U, MatÍas-Guiu JA, Ojeda-Hernandez D, de la Fuente-Martin S, Kamal OM, Benito-Martin MS, Selma-Calvo B, Montero-Escribano P, MatÍas-Guiu J. In Vitro Effects of Methylprednisolone over Oligodendroglial Cells: Foresight to Future Cell Therapies. Cells. 2023 May 30;12(11):1515. doi: 10.3390/cells12111515. PMID: 37296635; PMCID: PMC10252523.

[4]. Sun Y, Li J, A N, Li Z, Zhong W, Chen L, Liu S, Zhang B, Zhu Z, Li X. Methylprednisolone alleviates cognitive functions through the regulation of neuroinflammation in Alzheimer's disease. Front Immunol. 2023 May 1;14:1192940. doi: 10.3389/fimmu.2023.1192940. PMID: 37197654; PMCID: PMC10183590.