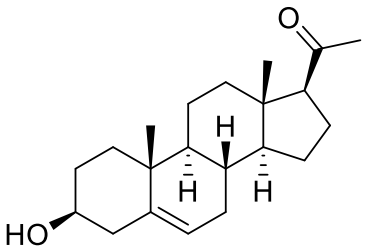
Product data sheet

MedKoo Cat#: 328065 Name: Pregnenolone CAS#: 145-13-1 Chemical Formula: $C_{21}H_{32}O_2$ Exact Mass: 316.2402 Molecular Weight: 316.485	
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:
Pregnenolone is a natural steroid hormone that serves as a precursor for a wide range of steroids, including mineralocorticoids, glucocorticoids, androgens, and estrogens.

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	17.25	54.50
Ethanol	22.0	69.51
Acetonitrile	1.0	3.16
Methanol	1.0	3.16

4. Stock solution preparation table:

Concentration / Solvent Volume / Mass	1 mg	5 mg	10 mg
1 mM	3.16 mL	15.80 mL	31.60 mL
5 mM	0.63 mL	3.16 mL	6.32 mL
10 mM	0.32 mL	1.58 mL	3.16 mL
50 mM	0.06 mL	0.32 mL	0.63 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. Sun X, Zhang C, Guo H, Chen J, Tao Y, Wang F, Lin X, Liu Q, Su L, Qin A. Pregnenolone Inhibits Osteoclast Differentiation and Protects Against Lipopolysaccharide-Induced Inflammatory Bone Destruction and Ovariectomy-Induced Bone Loss. Front Pharmacol. 2020 Mar 27;11:360. doi: 10.3389/fphar.2020.00360. PMID: 32292342; PMCID: PMC7135856.
2. Murugan S, Jakka P, Namani S, Mujumdar V, Radhakrishnan G. The neurosteroid pregnenolone promotes degradation of key proteins in the innate immune signaling to suppress inflammation. J Biol Chem. 2019 Mar 22;294(12):4596-4607. doi: 10.1074/jbc.RA118.005543. Epub 2019 Jan 15. PMID: 30647133; PMCID: PMC6433066.

In vivo study

1. Frau R, Miczán V, Traccis F, Aroni S, Pongor CI, Saba P, Serra V, Sagheddu C, Fanni S, Congiu M, Devoto P, Cheer JF, Katona I, Melis M. Prenatal THC exposure produces a hyperdopaminergic phenotype rescued by pregnenolone. Nat Neurosci. 2019 Dec;22(12):1975-1985. doi: 10.1038/s41593-019-0512-2. Epub 2019 Oct 14. PMID: 31611707; PMCID: PMC6884689.
2. Busquets-Garcia A, Soria-Gómez E, Redon B, Mackenbach Y, Vallée M, Chaouloff F, Varilh M, Ferreira G, Piazza PV, Marsicano G. Pregnenolone blocks cannabinoid-induced acute psychotic-like states in mice. Mol Psychiatry. 2017 Nov;22(11):1594-1603. doi: 10.1038/mp.2017.4. Epub 2017 Feb 21. PMID: 28220044; PMCID: PMC5447368.

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7. Bioactivity

Biological target:

Pregnenolone acts as a signaling-specific inhibitor of cannabinoid CB1 receptor, inhibits the effects of tetrahydrocannabinol (THC) that are mediated by the CB1 receptors.

In vitro activity

As shown in the Figures 5A, B, the early activation of ERK MAPK as determined by the phosphorylation of ERK in response to RANLK was significantly attenuated following treatment with Preg (Pregnenolone). The activation phosphorylation of the other MAPK members, p38, and JNK was not affected by Preg treatment (Figures 5A, C, D). The timely and coordinated activation of NF-κB and MAPK is necessary for the subsequent induction of c-Fos and NFATc1. NFATc1 is a crucial transcription factor required for precursor cell fusion and terminal osteoclast differentiation by transcriptionally regulating the expression of numerous osteoclast genes. The expression of c-Fos and NFATc1 was induced 72 h after RANKL stimulation, but was drastically reduced when cells were cultured in the presence of Preg in a dose-dependent manner (Figures 5G–I). Together biochemical analyses suggest that Preg inhibits osteoclast formation in part by suppressing intracellular ROS production and attenuating RANKL-induced activation of ERK MAPK and NF-κB signaling cascades which subsequent reduced the effective downstream induction of Fos and NFATc1.

Reference: Front Pharmacol. 2020; 11: 360. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7135856/

In vivo activity

To assess this, PREG (Pregnenolone) (6 mg/kg s.c. once daily for 9 days, from PND 15 to 23) was administered to VEH or PCE offspring, and acute VTA-containing slices were prepared 1 and 2 days following the last administration (Fig. 6a), when PREG is cleared from the brain. Remarkably, PREG rescued LTD at excitatory synapses on dopamine neurons to CTRL levels (Fig. 6b), without affecting synaptic efficacy in CTRL offspring. Moreover, PREG ameliorated PCE-induced dopamine neuron excitability in PCE slices, measured by resting membrane potential (Fig. 6c), as well as spontaneous (Fig. 6d–f) and evoked firing activity (Fig. 6g, ,h).h). PREG also fully restored the alterations in synaptic properties imposed by PCE on excitatory and inhibitory inputs on dopamine cells (Supplementary Fig. 12). Most importantly, PREG selectively prevented larger acute THC-induced enhancement of dopamine levels in NAcS (Fig. 6i,,j),j), and THC-induced disruption of somatosensory gating functions in PCE offspring (Fig. 6k). Finally, PREG mechanism of action was dissociated from its downstream neurosteroid metabolites (Supplementary Fig.13). Collectively, these results indicate that PREG prevents PCE-induced hyperdopaminergic states and confers resilience towards heightened acute effects of THC in PCE animals.

Reference: Nat Neurosci. 2019 Dec; 22(12): 1975–1985. https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6884689/

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.