Allopregnanolone is a progesterone metabolite. Allopregnanolone is an allosteric modulator of the GABA receptor. Used to treat postpartum depression. 

In Vitro: Allopregnanolone induces a significant increase in proliferation of neuroprogenitor cells derived from the rat hippocampus and human neural stem cells derived from the cerebral cortex in a dose-dependent manner. Allopregnanolone increases the expression of genes that promote mitosis and inhibits the expression of genes that repress cell proliferation[1]. Its biosynthesis begins with progesterone, which is converted to dihydroprogesterone by the enzyme 5α-DHP and after that, the enzyme 3α-HSOR catalyses the reduction of dihydroprogesterone toward allopregnanolone[2].

In Vivo: Allopregnanolone increases both the K⁺-evoked [³H]-glutamate and [³H]-GABA release in P rats. The neurosteroid also increases the basal release of [³H]-glutamate in VO rats in an effect that is dependent on the modulation of NMDA receptors as is reverted by Mg²⁺[2]. At therapeutic doses by either subcutaneous or intravenous routes, allopregnanolone mouse plasma levels range between 34-51ng/mL by 30min[3]. Allopregnanolone-induced neurogenesis correlates with restoration of learning and memory function in a mouse model of Alzheimer’s disease and is comparably efficacious in aged normal mice[4]. Progesterone and allopregnanolone has shown neuroprotective effects in different experimental models including stroke and spinal cord injury[5].

PROTOCOL (Extracted from published papers and Only for reference)

Animal Administration: [2][3] Rats: Allopregnanolone is dissolved in propyleneglycol to a concentration of 0.6 mM and diluted in Krebs Ringer bicarbonate glucose (KRBG) Mg²⁺-free buffer at pH 7.4 to 120 nM. To antagonize GABA receptors, 120 nM allopregnanolone plus 9.8 μM Bic (Bic+Allo groups) or 9.8 μM Bic alone (Bic groups) is used[2].

Mice: Allopregnanolone is dissolved in 20%w/v HBCD solution at 2.5 mg/mL by brief sonication and is subcutaneously (SC) injected to mice at 0.5, 1, and 10 mg/kg. Additionally, allopregnanolone is dissolved in 6%w/v SBECD solution at 0.5 mg/mL and injected IV to mice at 0.1, 0.5, and 1 mg/kg. HBCD or SBECD alone are included as vehicle controls. Topical transdermal is applied on the shaved dorsal surface at 50mg/kg using a gel solution of 3.3% allopregnanolone (w/w), 45% DMSO, 30% EtOH, 2.5% Klucel MF, 19.2% PEG-300. Intranasal formulations are prepared in both 100% castor oil and 20% HBCD. Intramuscular formulation is administered to mice as allopregnanolone 1.5 mg/mL in 6% SBECD[3].

References:


CAIndexNames:
Pregnan-20-one, 3-hydroxy-, (3α,5α)-

SMILES:
O=C(C[C@H]1CC[C@@]2((H)))[C@H]3((H))CC[C@@]4((H))C[C@H]([O])CC[C@@]4([C@H]3)C[C@H])CC[C@@]21C

Caution: Product has not been fully validated for medical applications. For research use only.

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