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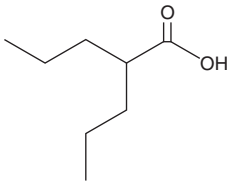
PRODUCT INFORMATION

Valproic Acid

Item No. 35739

CAS Registry No.: 99-66-1
Formal Name: 2-propyl-pentanoic acid
Synonyms: NSC 93819, 2-Propylvaleric Acid, Valproate, VPA
MF: $C_8H_{16}O_2$
FW: 144.2
Purity: ≥95%
Supplied as: A neat liquid
Storage: -20°C
Stability: ≥2 years



Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Laboratory Procedures

Valproic acid is supplied as a neat liquid. A stock solution may be made by dissolving the valproic acid in the solvent of choice, which should be purged with an inert gas. Valproic acid is soluble in organic solvents such as ethanol, DMSO, and dimethyl formamide. The solubility of valproic acid in these solvents is approximately 33 mg/ml.

Further dilutions of the stock solution into aqueous buffers or isotonic saline should be made prior to performing biological experiments. Ensure that the residual amount of organic solvent is insignificant, since organic solvents may have physiological effects at low concentrations. Organic solvent-free aqueous solutions of valproic acid can be prepared by directly dissolving the neat liquid in aqueous buffers. The solubility of valproic acid in PBS (pH 7.2) is approximately 0.12 mg/ml. We do not recommend storing the aqueous solution for more than one day.

Description

Valproic acid is an analog of the natural fatty acid valeric acid that inhibits class I histone deacetylases (HDACs) with IC_{50} values of approximately 2 mM.[1] It decreases the number of axon branches in sensory neurons isolated from newborn rat dorsal root ganglia, an effect that is reversed by inositol-1,4,5-trisphosphate (1,4,5-IP_3).[2] *In vivo*, valproic acid inhibits amyloid-β deposition and neuritic plaque formation and decreases escape latency in Morris water maze, indicating improved memory performance, in the APP23 transgenic mouse model of Alzheimer's disease.[3] Valproic acid has anticonvulsant activity in the pentylenetetrazole seizure threshold test in mice (ED_{50} = 0.71 mmol/kg) but induces neurotoxicity when administered at doses greater than or equal to 1.2 mmol/kg.[4] Formulations containing valproic acid have been used in the treatment of bipolar disorder and various seizure disorders.

References

1. Göttlicher, M., Minucci, S., Zhu, P., *et al.* Valproic acid defines a novel class of HDAC inhibitors inducing differentiation of transformed cells. *EMBO J.* **20(24)**, 6969-6978 (2001).
2. Williams, R.S.B., Cheng, L., Mudge, A.W., *et al.* A common mechanism of action for three mood-stabilizing drugs. *Nature* **417(6886)**, 292-295 (2002).
3. Qing, H., He, G., Ly, P.T., *et al.* Valproic acid inhibits Aβ production, neuritic plaque formation, and behavioral deficits in Alzheimer's disease mouse models. *J. Exp. Med.* **205(12)**, 2781-2789 (2008).
4. Elmazar, M.M., Hauck, R.S., and Nau, H. Anticonvulsant and neurotoxic activities of twelve analogues of valproic acid. *J. Pharm. Sci.* **82(12)**, 1255-1258 (1993).

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