

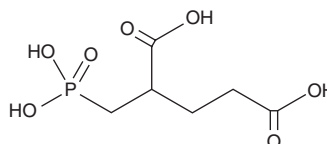
# PRODUCT INFORMATION



## 2-(Phosphonomethyl)-pentanedioic Acid

Item No. 21916

**CAS Registry No.:** 173039-10-6  
**Formal Name:** 2-(phosphonomethyl)-pentanedioic acid  
**Synonym:** 2-PMPA  
**MF:** C<sub>6</sub>H<sub>11</sub>O<sub>7</sub>P  
**FW:** 226.1  
**Purity:** ≥95%  
**Supplied as:** A crystalline solid  
**Storage:** -20°C  
**Stability:** ≥4 years



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

### Laboratory Procedures

2-(Phosphonomethyl)-pentanedioic acid (2-PMPA) is supplied as a crystalline solid. Aqueous solutions of 2-PMPA can be prepared by directly dissolving the crystalline solid in aqueous buffers. The solubility of 2-PMPA in PBS, pH 7.2, is approximately 10 mg/ml. We do not recommend storing the aqueous solution for more than one day.

### Description

2-PMPA is a potent inhibitor of glutamate carboxypeptidase II (GCP II), also known as N-acetylated  $\alpha$ -linked dipeptidase (NAALADase), with a  $K_i$  value of 98 pM for release of glutamate from the NAALADase peptide substrate N-acetylaspartylglutamate (NAAG).<sup>1</sup> It is selective for GCP II/NAALADase over a panel of 100 receptors, transporters, ion channels, and enzymes at a concentration of 10  $\mu$ M.<sup>2</sup> 2-PMPA is neuroprotective against hypoxia ( $EC_{50}$  = 8.4  $\mu$ M), but not veratridine-induced injury, in neuron-enriched primary cultures from rat embryo cerebellum.<sup>3</sup> *In vivo*, 2-PMPA reduces neuronal cell death induced by middle cerebral artery occlusion *via* increases in NAAG expression and reduction of glutamate in rats.<sup>2</sup> 2-PMPA (100 mg/kg) blocks the conditioned place preference response to cocaine, but not food, in male rats.<sup>4</sup> It reduces the number of flinches induced by formalin injection into the footpad of mice when administered at a dose of 10  $\mu$ g per animal, an effect that is reversed by the group II metabotropic glutamate receptor antagonist LY341495.<sup>5</sup> 2-PMPA also decreases severity and delays onset of experimental autoimmune encephalomyelitis (EAE) in mice.<sup>6</sup>

### References

1. Luthi-Carter, R., Barczak, A.K., Speno, H., *et al.* *Brain Res.* **795(1-2)**, 341-348 (1998).
2. Slusher, B.S., Vornov, J.J., Thomas, A.G., *et al.* *Nat. Med.* **5(12)**, 1396-1402 (1999).
3. Tortella, F.C., Lin, Y., Ved, H., *et al.* *Eur. J. Pharmacol.* **402(1-2)**, 31-37 (2000).
4. Slusher, B.S., Thomas, A., Paul, M., *et al.* *Synapse* **41(1)**, 22-28 (2001).
5. Yamamoto, T., Kozikowski, A., Zhou, J., *et al.* *Mol. Pain* **4:31** (2008).
6. Ha, D., Bing, S.J., Ahn, G., *et al.* *FEBS J.* **283(18)**, 3438-3456 (2016).

#### WARNING

THIS PRODUCT IS FOR RESEARCH ONLY - NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

#### SAFETY DATA

This material should be considered hazardous until further information becomes available. Do not ingest, inhale, get in eyes, on skin, or on clothing. Wash thoroughly after handling. Before use, the user must review the complete Safety Data Sheet, which has been sent via email to your institution.

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