

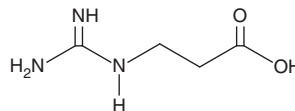
PRODUCT INFORMATION



3-Guanidinopropionic Acid

Item No. 16725

CAS Registry No.: 353-09-3
Formal Name: N-(aminoiminomethyl)- β -alanine
Synonyms: β -GPA, PNU 10483
MF: $C_4H_9N_3O_2$
FW: 131.1
Purity: $\geq 98\%$
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

3-Guanidinopropionic acid is supplied as a crystalline solid. Aqueous solutions of 3-guanidinopropionic acid can be prepared by directly dissolving the crystalline solid in aqueous buffers. The solubility of 3-guanidinopropionic acid in PBS (pH 7.2) is approximately 50 mg/ml. We do not recommend storing the aqueous solution for more than one day.

Description

3-Guanidinopropionic acid is a creatine analog that alters skeletal muscle energy expenditure. It reduces cellular ATP, creatine, and phosphocreatine levels and stimulates AMP-activated protein kinase (AMPK), activating PPAR γ coactivator 1 α (PGC-1 α).¹⁻⁴ PGC-1 α activation results in enhanced expression of AMPK, as well as genes for oxidative phosphorylation, electron transport chain, and mitochondrial biogenesis, increasing oxidative muscle fibers, numbers of mitochondria, and motor performance.^{1,5} 3-Guanidinopropionic acid evokes a shift from glycolytic to oxidative metabolism, increased cellular glucose uptake, and increased fatigue tolerance.² In aged rats, reduced mitochondrial biogenesis in response to chronic activation of AMPK with 3-guanidinopropionic acid leads to metabolic insufficiency that can contribute to muscle loss.^{5,6}

References

1. Chaturvedi, R.K., Adhietty, P., Shukla, S., *et al.* Impaired PGC-1 α function in muscle in Huntington's disease. *Hum. Mol. Genet.* **18(16)**, 3048-3065 (2009).
2. Oudman, I., Clark, J.F., and Brewster, L.M. The effect of the creatine analogue beta-guanidinopropionic acid on energy metabolism: A systematic review. *PLoS One* **8(1)**, 1-13 (2013).
3. Shoubridge, E.A., Challiss, R.A.J., Hayes, D.J., *et al.* Biochemical adaptation in the skeletal muscle of rats depleted of creatine with the substrate analogue β -guanidinopropionic acid. *Biochem. J.* **232(1)**, 125-131 (1985).
4. Boehm, E., Chan, S., Monfared, M., *et al.* Creatine transporter activity and content in the rat heart supplemented by and depleted of creatine. *Am. J. Physiol. Endocrinol. Metab.* **284(2)**, E399-E406 (2003).
5. Reznick, R.M., Zong, H., Li, J., *et al.* Aging-associated reductions in AMP-activated protein kinase activity and mitochondrial biogenesis. *Cell Metab.* **5(2)**, 151-156 (2007).
6. Herbst, A., Johnson, C.J., Hynes, K., *et al.* Mitochondrial biogenesis drives a vicious cycle of metabolic insufficiency and mitochondrial DNA deletion mutation accumulation in aged rat skeletal muscle fibers. *PLoS One* **8(3)**, 1-8 (2013).

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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