Small Molecules

Ascorbic Acid

Antioxidant; Reducing agent

Catalog # 72132

500 mg

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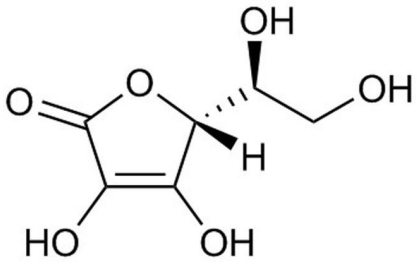
Product Description

Ascorbic Acid is a naturally occurring lactone that is produced by plants and many animals, but not humans or other primates. It acts as an electron donor (i.e. reducing agent), and shows antioxidant activity, particularly against reactive oxygen species. Ascorbic Acid is a cofactor for monooxygenase and dioxygenase as well as other enzymes (Arrigoni & De Tullio; Du et al.).

Molecular Name:	Ascorbic Acid
Alternative Names:	(+)-Ascorbic Acid; L-Ascorbic Acid; NSC 218455; NSC 33832; Vitamin C
CAS Number:	50-81-7
Chemical Formula:	$C_6H_8O_6$
Molecular Weight:	176.1 g/mol
Purity:	≥ 95%
Chemical Name:	(R)-5-((S)-1,2-dihydroxyethyl)-3,4-dihydroxyfuran-2(5H)-one
Structure:	



Properties

Physical Appearance:	A crystalline solid
Storage:	Product stable at -20°C as supplied. Protect from prolonged exposure to light. Stable as supplied for 12 months from date of receipt.
Solubility:	· PBS (pH 7.2) ≤ 18 mM · DMSO ≤ 55 mM For example, to prepare a 10 mM stock solution in PBS, resuspend 100 mg in 56.8 mL of PBS (pH 7.2). Prepare stock solution fresh before use. Information regarding stability of small molecules in solution has rarely been reported, however, as a general guide we recommend storage in DMSO at -20°C. Aliquot into working volumes to avoid repeated freeze-thaw cycles. The effect of storage of stock solution on compound performance should be tested for each application. For use as a cell culture supplement, stock solution should be diluted into culture medium immediately before use. Avoid final DMSO concentration above 0.1% due to potential cell toxicity.

Published Applications

MAINTENANCE AND SELF-RENEWAL
· Supports proliferation of mesenchymal stem cells (Choi et al.).
REPROGRAMMING
· Increases the efficiency of reprogramming mouse and human fibroblasts to induced pluripotent stem (iPS) cells (Esteban et al.) partly through JHDM1 histone demethylase activity (Wang et al.).
· Prevents aberrant DNA methylation of the Dlk1-Dio3 locus during reprogramming of mouse somatic cells to iPS cells (Stadtfeld et al.).
DIFFERENTIATION
· Promotes differentiation of osteoblasts from human and mouse mesenchymal cells (Pittenger et al.; Tropel et al.).
· Promotes differentiation of osteoblasts from mouse embryonic stem (ES) cells (zur Nieden et al.).
· Enhances differentiation of cardiomyocytes from mouse ES cells (Takahashi et al.).

References

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Esteban MA et al. (2010) Vitamin C enhances the generation of mouse and human induced pluripotent stem cells. Cell Stem Cell 6(1): 71–9.
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Takahashi T et al. (2003) Ascorbic acid enhances differentiation of embryonic stem cells into cardiac myocytes. Circulation 107(14): 1912–6.
Tropel P et al. (2004) Isolation and characterisation of mesenchymal stem cells from adult mouse bone marrow. Exp Cell Res 295(2): 395–406.
Wang T et al. (2011) The histone demethylases Jhdm1a/1b enhance somatic cell reprogramming in a vitamin-C-dependent manner. Cell Stem Cell 9(6): 575–87.
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