AICAR is an adenosine analog that selectively activates AMP-activated protein kinase (AMPK). AMPK functions as a metabolic sensor that regulates lipid and glucose metabolism to maintain cellular energy homeostasis and to protect against metabolic stress (Hardie & Carling). By activating AMPK, AICAR inhibits lipid synthesis and glucose uptake in hepatocytes and adipocytes, respectively (Corton et al.; Salt et al.).

Molecular Name: AICAR
Alternative Names: Acadesine; AICA Riboside; NSC 105823
CAS Number: 2627-69-2
Chemical Formula: C₉H₁₄N₄O₅
Molecular Weight: 258.2 g/mol
Purity: ≥ 98%
Chemical Name: 5-amino-1-β-D-ribofuranosyl-1H-imidazole-4-carboxamide

Structure:

A crystalline solid

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) ≤ 9 mM
- DMSO ≤ 75 mM
- Absolute ethanol ≤ 3 mM

For example, to prepare a 10 mM stock solution in DMSO, resuspend 10 mg in 3.87 mL of fresh DMSO.

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.
Small Molecules

AICAR

Published Applications

MAINTENANCE AND SELF-RENEWAL
- Induces upregulation of the pluripotency network genes (Klf4, Klf2, Nanog, Oct4, Myc, Sox2) and epigenetic-associated proteins (Dnmt3a, Mbd3) in mouse embryonic stem (ES) cells, and inhibits retinoic acid-induced differentiation (Adamo et al.; Shi et al.).

DIFFERENTIATION
- Promotes differentiation and mineralization of MC3T3-E1 osteoblastic cells (Kanazawa et al.).
- Initiates proliferation and promotes osteogenic differentiation, while inhibiting adipogenic differentiation, of human amnion-derived mesenchymal stem cells (MSCs) and rabbit bone marrow-derived MSCs (Wu et al.).
- Suppresses proliferation and induces astroglial differentiation in neural stem cells (NSCs) and in the immortalized NSC line C17.2 (C17.2-NSC; Zang et al. 2008, 2009).
- Decreased proliferation and Nanog expression in mouse ES cells, with increased erythroid differentiation (Chae et al.).

References

Related Small Molecules
For a complete list of small molecules available from STEMCELL Technologies, visit www.stemcell.com/smallmolecules or contact us at techsupport@stemcell.com.

This product is hazardous. Please refer to the Safety Data Sheet (SDS).