

Small Molecules

Metformin

AMPK activator; Mitochondrial respiratory chain complex I inhibitor

Catalog # 73252
73254

1 g
5 g



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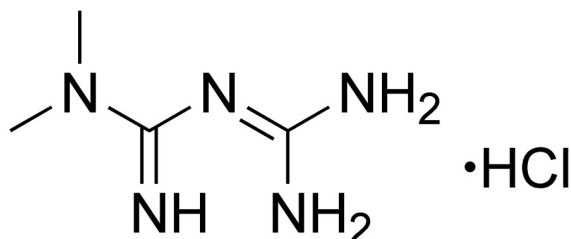
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Product Description

Metformin is an activator of the AMP-activated protein kinase (AMPK) pathway, and an inhibitor of mitochondrial respiratory chain complex I (Rena et al.; Viollet et al.). It acts as an antihyperglycemic agent to lower plasma glucose levels and improve insulin sensitivity (Viollet et al.). This product is provided as the hydrochloride salt of the molecule.

Molecular Name:	Metformin (Hydrochloride)
Alternative Names:	Apophage, Diaformin, Fornidd, Glucoformin, Glucophage, LA 6023, Melbin, Orabet, Riomet, Walaphage
CAS Number:	1115-70-4
Chemical Formula:	$C_4H_{11}N_5 \cdot HCl$
Molecular Weight:	165.6 g/mol
Purity:	≥ 98%
Chemical Name:	N,N-dimethyl-imidodicarbonimidic diamide, monohydrochloride
Structure:	



Properties

Physical Appearance:	A crystalline solid
Storage:	Product stable at -20°C as supplied. Protect from prolonged exposure to light. For product expiry date, please contact techsupport@stemcell.com .
Solubility:	· PBS (pH 7.2) ≤ 6 mM - For example, to prepare a 5 mM stock solution in PBS (pH 7.2), resuspend 100 mg in 121 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 PBS 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.

Published Applications

DIFFERENTIATION

- Promotes neurogenesis in mouse cortical precursors and human forebrain neural precursors in vitro, and in adult mouse central nervous system in vivo, via activation of the aPKC-CBP pathway (Wang et al.).

METABOLISM

- Stimulates glucose uptake in skeletal muscle and suppresses gluconeogenesis in the liver (Kim et al.; Shaw et al.).
- Reduces fatty liver disease in obese (ob/ob) mice (Lin et al.).
- Inhibits secretion of the adipocyte hormone leptin in mouse brown adipocytes (Klein et al.).

CANCER RESEARCH

- Inhibits tumor cell growth in various cancer cell lines and in mouse xenograft models (Dowling et al.; Zakikhani et al.; Isakovic et al.).
- Inhibits the inflammatory response associated with cancer stem cell growth (Hirsch et al.).

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- Zakikhani M et al. (2006) Metformin is an AMP kinase-dependent growth inhibitor for breast cancer cells. *Cancer Res* 66(21): 10269–73.

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