



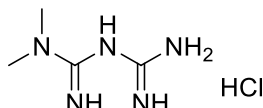
Catalog # 10-2469

Metformin HCl

1115-70-4

1,1-Dimethylbiguanide hydrochloride

Lot # X101831



Clinically useful antidiabetic agent. Lowers plasma glucose levels and improves insulin sensitivity. Inhibits hepatic gluconeogenesis by activation of the AMP-activated protein kinase (AMPK) pathway.^{1,2} Displays antiproliferative and pro-apoptotic actions in a variety of cancer cell lines.^{3,4} Induces autophagy via inhibition of the mTOR pathway. Activates PGC1 α and improves mitochondrial dynamics in renal tubular cells.⁵ Upregulates SIRT1 activity in endothelial cells.⁶ Neuroprotective and lowers α -synuclein phosphorylation in the Parkinson's disease MPTP mouse model.⁷ Lowers body weight by increasing circulating levels of peptide hormone growth/differentiation factor 15 (GDF15).⁸

- 1) Zhou *et al.* (2001), *Role of AMP-activated protein kinase in mechanism of metformin action*; J. Clin. Invest., **108** 1167
- 2) Shaw *et al.* (2005), *The kinase LKB1 mediates glucose homeostasis in liver and therapeutic effects of metformin*; Science, **310** 1642
- 3) Shi *et al.* (2012), *Therapeutic metformin/AMPK activation blocked lymphoma cell growth via inhibition of mTOR pathway and induction of autophagy*; Cell Death Dis., **3** e275
- 4) Rego *et al.* (2017) *Anti-tumor effects of metformin on head and neck carcinoma cell lines: A systemic review*; Oncol. Lett., **13** 554
- 5) Lee *et al.* (2017) *PGC1 α Activators Mitigate Diabetic Tubulopathy by Improving Mitochondrial Dynamics and Quality Control*; J. Diabetes Res., **2017** 6483572
- 6) Zheng *et al.* (2012) *Sirtuin 1-mediated cellular metabolic memory of high glucose via the LKB1/AMPK/ROS pathway and therapeutic effects of metformin*; Diabetes, **61** 217
- 7) Katila *et al.* (2017) *Metformin lowers α -synuclein phosphorylation and upregulates neurotrophic factor in the MPTP mouse model of Parkinson's disease*; Neuropharmacology, **125** 396
- 8) Coll *et al.* (2020) *GDF15 mediates the effects of metformin on body weight and energy balance*; Nature, **578** 444

PHYSICAL DATA

Molecular Weight:	165.63
Molecular Formula:	C ₄ H ₁₁ N ₅ · HCl
Purity:	98%
	NMR: (Conforms)
Solubility:	DMSO (up to 8 mg/ml), water (up to 16 mg/ml)
Physical Description:	White solid
Storage and Stability:	Store as supplied desiccated at room temperature for up to 2 years from the date of purchase. Solutions in DMSO or distilled water may be stored at -20°C for up to 2 months.

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