

Product Information

3-Isobutyl-1-methylxanthine

Catalog Number **I5879**

CAS RN 28822-58-4

Synonyms: IBMX, 1-Methyl-3-isobutylxanthine, 3,7-Dihydro-1-methyl-3-(2-methylpropyl)-1H-purine-2,6-dione, 3-Isobutyl-1-methyl-2,6(1H,3H)-purinedione

Molecular Formula: C₁₀H₁₄N₄O₂

Molecular Weight: 222.2

Product Description

Methylxanthines such as caffeine and theophylline inhibit adenosine 3',5'-cyclic monophosphate phosphodiesterase (cAMP PDE).¹ 3-Isobutyl-1-methylxanthine (IBMX) has been shown to be a potent inhibitor of cAMP PDE, significantly more effective than theophylline.²⁻⁶ IBMX inhibits cyclic nucleotide PDE with subsequent inhibition of cyclic nucleotide hydrolysis, which results in accumulation of cyclic AMP and guanosine 3',5'-cyclic monophosphate.^{7,8} In a study of cyclic AMP and insulin release by islets of Langerhans, IBMX at 1 mM caused a marked increase in the intracellular concentration of cyclic AMP in the presence of glucose.⁴

For lipolysis stimulation in fat cells, IBMX was 20-fold more effective than theophylline, used at 0.05 mM.³ IBMX has been shown to promote the conversion of fibroblast cells into adipose cells.⁹ As a PDE inhibitor, IBMX was shown to inhibit the growth of carcinoma cells both *in vivo* and *in vitro* in mice.¹⁰

Various publications have cited use of this specific IBMX product in different systems, such as:

- Mouse adipocyte cultures¹¹
- Mesenchymal stem cells, in adipogenic differentiation medium¹²
- Transfected HEK 293 cells¹³

Precautions and Disclaimer

For R&D use only. Not for drug, household, or other uses.

Preparation Instructions

IBMX is soluble in different organic solvents, as follows:

- Warm methanol at 50 mg/mL
- Ethanol at 10 mg/mL.^{12,14} Dissolves at 25 mg/mL only with sonication.¹⁴
- Various publications report preparation in DMSO at 200 mM¹³ and at 110 mg/mL.¹⁵

A 10 mM aqueous solution can be prepared by warming in a boiling water bath.¹⁶

Storage/Stability

One publication reports storage of IBMX solutions in ethanol at 0.125 mg/mL at 4 °C for at least three months.¹⁴ Aqueous solutions can be frozen in aliquots, then thawed for use by heating in a boiling water bath. These aliquots are stable for several months.¹⁶ Solutions in DMSO may be stored at -20 °C.¹⁵

References

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