3-Methyladenine

Autophagy Inhibitor; PI3K inhibitor

Catalog code: inh-3ma-2

https://www.invivogen.com/3-methyladenine

For research use only

Version 23D21-MM

PRODUCT INFORMATION

Contents

- 2 x 50 mg of 3-Methyladenine

Storage and stability:

- 3-Methyladenine is shipped at room temperature. Upon receipt, store at 15-25 °C (room temperature).
- Upon resuspension in DMSO, prepare aliquots of 3-Methyladenine and store at -20°C. 3-Methyladenine resuspended in DMSO is stable for 3 months when properly stored. Avoid repeated freeze-thaw cycles.

Quality control:

- ≥90% (UHPLC).
- The absence of bacterial contamination (e.g. lipoproteins and endotoxins) has been confirmed using HEK-Blue™ TLR2 and HEK-Blue™ TLR4 cells.

DESCRIPTION

3-Methyladenine (also known as 3-MA) is an inhibitor of phosphatidylinositol 3-kinases (PI3K). PI3K plays an important role in many biological processes, including controlling the activation of mTOR, a key regulator of autophagy. 3-MA inhibits autophagy by blocking autophagosome formation via the inhibition of class III PI3K[1]. 3-Methyladenine plays a dual role in autophagy. Prolonged treatment with 3-Methyladenine promotes autophagy under nutrient-rich conditions, whereas 3-Methyladenine inhibits starvation-induced autophagy[1]. These results are attributed to differential effects on class I versus class III PI3K.

In addition to its role in autophagy, 3-Methyladenine has been implicated in cancer therapy[2]. It has been revealed that 3-Methyladenine suppresses the invasion of highly metastatic cancer cells through the inhibition of class I and II PI3K[3]. Further studies demonstrated that 3-Methyladenine can induce caspase-dependent cell death that is independent of autophagy inhibition[4].

1. Wu Y. *et al.*, 2010. Dual role of 3-methyladenine in modulation of autophagy via different temporal patterns of inhibition on class I and III phosphoinositide 3-kinase. J Biol Chem. 285(14):10850-61. **2. Cheong H *et al.*, 2012.** Therapeutic targets in cancer cell metabolism and autophagy. Nature Biotechnology 30:671–678. **3. Ito S. *et al.*, 2007.3**-Methyladenine suppresses cell migration and invasion of HT1080 fibrosarcoma cells through inhibiting phosphoinositide 3-kinases independently of autophagy inhibition. Int J Oncol 31 261-268. **4. Hou H. *et al.*, 2012. I**nhibitors of phosphatidylinositol 3'-kinases promote mitotic cell death in HeLa cells. PLoS One. 7(4):e35665. **5. Jing C. et al., 2012.** Autophagy activation is associated with neuroprotection against apoptosis via a mitochondrial pathway in a rat model of subarachnoid hemorrhage. Neuroscience. 213:144-53.

CHEMICAL PROPERTIES

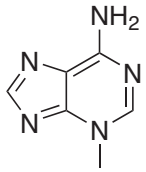
CAS number: 5142-23-4

Formula: $C_6H_7N_5$

Molecular weight: 149.2 g/mol

Solubility: 7.5 mg/ml (50 mM) in DMSO heated for 5 minutes at 55°C

Structure:



METHODS

Preparation of stock solution at 7.5 mg/ml (50 mM)

1. Weigh 5 mg of 3-Methyladenine.
2. Add 670 µl of DMSO.
3. Heat to 55°C for 5 minutes.
4. Once 3-Methyladenine has been dissolved in DMSO, it can be used immediately or stored at -20°C for 3 months.
5. Prepare further dilutions using sterile culture medium. We do not recommend storing the aqueous solution for more than one day.

PROTOCOLS

For reference only; as described in the indicated publications.

Cell Culture Assay[1]

Cell type: Mouse embryonic fibroblasts (MEFs)

Working concentration: 5 mM

Pre-incubation time: 1-9 hours

Method: Confocal microscopy observation of LC3 autophagy

Animal Study[5]

Animal model: Adult male Sprague–Dawley rats

Dose: 400 nM

Administration: Intracerebral ventricular

Solubility: 30% propylene glycol, 5% Tween 80, 65% D5W, 30 mg/ml

RELATED PRODUCTS

Product	Description	Cat. Code
Rapamycin	mTOR inhibitor	tlrl-rap
Bafilomycin A1	Autophagy inhibitor	tlrl-baf1

TECHNICAL SUPPORT
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