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Lieferung & Zahlungsart

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Zuschläge

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Urea (Standard)

Cat. No.: HY-Y0271R

CAS No.: 57-13-6

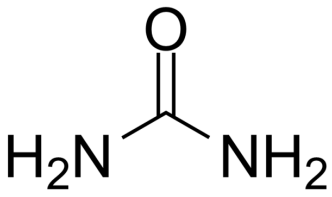
Molecular Formula: CH_4N_2O

Molecular Weight: 60.06

Target: Endogenous Metabolite; Carbonic Anhydrase; ERK; Apoptosis

Pathway: Metabolic Enzyme/Protease; MAPK/ERK Pathway; Stem Cell/Wnt; Apoptosis

Storage: Please store the product under the recommended conditions in the Certificate of Analysis.



BIOLOGICAL ACTIVITY

Description

Urea (Standard) is the analytical standard of Urea. This product is intended for research and analytical applications. Urea is a powerful protein denaturant via both direct and indirect mechanisms[1]. A potent emollient and keratolytic agent[2]. Used as a diuretic agent. Blood urea nitrogen (BUN) has been utilized to evaluate renal function[3]. Widely used in fertilizers as a source of nitrogen and is an important raw material for the chemical industry.

In Vitro

Urea standard (550-1000 mosmol/kg, 24 h) inhibits the proliferation of murine inner medullary collecting duct cell mIMCD3, arrests cell cycle at G2/M phase, induces apoptosis in mIMCD3[4].

Urea standard (5-300 mM, 1 h) increases protein carbonylation, causes oxidative stress and DNA damage (especially 8-oxoguanine damage) in mIMCD3 cells[5].

Urea standard (0-100 mM, 18 h) post-transcriptionally reversibly inhibits LPS (HY-D1056)-induced NO synthesis in RAW264.7, causes macrophage dysfunction and affects the host's immune defense mechanism[6].

Urea standard (200 mM, 5 min) increases phosphorylation of MEK1 and MEK2, causes the activation of ERK in mIMCD3 cells [7].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Cell Cycle Analysis[4]

Cell Line:	mIMCD3
Concentration:	550-1000 mosmol/kg
Incubation Time:	24 h
Result:	Arrested cell cycle at G2/M phase.

Western Blot Analysis[5]

Cell Line:	mIMCD3
Concentration:	300 mM
Incubation Time:	15 min
Result:	Increased the carbonylation of 36 kDa and 70 kDa proteins.

In Vivo

Urea standard (30 g/kg, continuous iv infusion, 2-14 days) induces osmotic diuresis, and causes diabetic nephropathy in rats

models[8].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

Animal Model:	Wistar rats[8]
Dosage:	30 g/kg
Administration:	continuous iv infusion, 2-14 days
Result:	Increased kidney weight, renal protein content and glomerular hyperfiltration in rats.

REFERENCES

[1]. Bennion BJ, et al. The molecular basis for the chemical denaturation of proteins by urea. Proc Natl Acad Sci U S A. 2003 Apr 29;100(9):5142-7.

[2]. Pan M, et al. Urea: a comprehensive review of the clinical literature. Dermatol Online J. 2013 Nov 15;19(11):20392.

[3]. Wang H, et al. Urea. Subcell Biochem. 2014;73:7-29.

[4]. Michea L, et al., Cell cycle delay and apoptosis are induced by high salt and urea in renal medullary cells. Am J Physiol Renal Physiol. 2000 Feb;278(2):F209-18.

[5]. Zhang Z, et al., High urea and NaCl carbonylate proteins in renal cells in culture and in vivo, and high urea causes 8-oxoguanine lesions in their DNA. Proc Natl Acad Sci U S A. 2004 Jun 22;101(25):9491-6.

[6]. Prabhakar SS, et al., Urea inhibits inducible nitric oxide synthase in macrophage cell line. Am J Physiol. 1997 Dec;273(6):C1882-8.

[7]. Yang XY, et al., ERK activation by urea in the renal inner medullary mIMCD3 cell line. Am J Physiol. 1999 Aug;277(2):F176-85.

[8]. Ogino Y, et al., Effects of chronic, urea-induced osmotic diuresis on kidney weight and function in rats. Diabetologia. 1994 Mar;37(3):225-31.

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