Product Data Sheet

Product Name: m6A-ATP,100mM Sodium Solution
Cat. No.: GB20006

Chemical Properties

Cas. No.			
Formula	$C_{11}H_{18}N_5O_{13}P_3$(free acid)	M.Wt	521.21(free acid)
Solubility		Storage	-20°C or below, always avoid freeze-thaw cycles.
General tips	For obtaining a higher solubility , please warm the tube at 37 ℃ and shake it in the ultrasonic bath for a while.Stock solution can be stored below -20℃ for several months.		
Shipping Condition	Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request.		
Structure			

Protocol

Kinase experiment [1]:

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Preparation Method	The kinase activity of GSK3β was evaluated using an in vitro kinase assay with a phosphopeptide substrate derived from glycogen synthase. The substrate peptide, YRRAAVPPSPSLSRHSSPHQ(pS)EDEEE, was designed to mimic the primed phosphorylation site of glycogen synthase. The assay was conducted by incubating 1.0μM of GST-tagged GSK3β with 10μM of the substrate peptide in the presence of 250μM ATP, m6A-ATP, or N^6-furfuryl-ATP at 37°C for 2 hours. The reaction was carried out in a 100mM sodium solution, which was diluted to achieve a final concentration of 250μM for the nucleotide triphosphates. To assess the kinase activity, the phosphorylation states of the substrate peptide were analyzed using electrospray ionization mass spectrometry (ESI-MS) in "ultrazoom" scan mode. The $[M + 3H]^{3+}$ ions corresponding to the mono-, di-, and tri-phosphorylated forms of the peptide were monitored to determine the relative abundances of each phosphorylated species. This approach allowed for the quantification of GSK3β activity by calculating the conversion ratios of the different phosphorylated forms of the peptide.
Reaction Conditions	250μM, 2h
Applications	m6A-ATP facilitated the phosphorylation of 67.8% of the GSK3β substrate peptide.

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References:
[1] Dong X, Sun J, Miao W, et al. Proteome-Wide Characterizations of N 6-Methyl-Adenosine Triphosphate- and N 6-Furfuryl-Adenosine Triphosphate-Binding Capabilities of Kinases, Analytical chemistry, 2021, 93(39): 13251-13259.

Background

m6A-ATP,100mM Sodium Solution is the N^6-modified ATP derivative, acting as the adenosine agonist with an ED_{50} value of 17250nM[1]. m6A-ATP,100mM Sodium Solution can be used to synthesize oligopeptide chains in vitro and serves as a crucial substrate for in vitro oligopeptide synthesis. Both unmethylated and N^6-methylated RNA sequences were generated through in vitro transcription, utilizing ATP and m6A-ATP as distinct nucleotide precursors, respectively[2]. m6A-ATP,100mM Sodium Solution can be used as raw materials to synthesize methylated mRNA and non-coding RNAs (ncRNAs), and m6A-modified RNA has increased stability and participates in translation and intracellular localization regulation[3]. m6A-ATP,100mM Sodium Solution can affect the ATP probe labeling efficiency of GSK3α. The ATP probe labeling efficiencies for GSK3α were reduced by 15%, 44%, and 64% at concentrations of 10, 100, and 200μM m6A-ATP, respectively, with concentration-dependent inhibition[4]. Incubation with 250μM m6A-

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ATP at physiological temperature (37°C) for 2 hours facilitated GST-tagged GSK3β-mediated phosphorylation of a glycogen synthase 1-derived peptide substrate (YRRAAVPPSPSLSRHSSPHQ(pS)EDEEE)[4].

References:

[1] Ribeiro J A, Sebastião A M. On the type of receptor involved in the inhibitory action of adenosine at the neuromuscular junction[J]. British journal of pharmacology, 1985, 84(4): 911.
[2] Xiao Y L, Liu S, Ge R, et al. Transcriptome-wide profiling and quantification of N 6-methyladenosine by enzyme-assisted adenosine deamination[J]. Nature biotechnology, 2023, 41(7): 993-1003.
[3]Sendinc E, Shi Y. RNA m6A methylation across the transcriptome[J]. Molecular cell, 2023, 83(3): 428-441.
[4] Dong X, Sun J, Miao W, et al. Proteome-Wide Characterizations of N 6-Methyl-Adenosine Triphosphate-and N 6-Furfuryl-Adenosine Triphosphate-Binding Capabilities of Kinases[J]. Analytical chemistry, 2021, 93(39): 13251-13259.

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