
Product Data Sheet

Product Name: mCAP
 Cat. No.: GC12563

Chemical Properties

Cas. No.

SMILES OC1C(COP([O-])(OP([O-])(OP([O-])(OCC2OC(N3C=[N+](C)C4=C3N=C(N)NC4=O)C(O)C2O)=O)=O)=O)OC(N5C=NC6=C5N=C(N)NC6=O)C1O

Formula $C_{21}H_{30}N_{10}O_{18}P_3$ (free acid) M.Wt 803.4 g/mol (free acid)

Solubility Storage Store at -20°C or below

General tips For obtaining a higher solubility , please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C 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

Background

mRNA of eucaryon and virus has a monomethylated cap structure, m⁷G(5')ppp(5')G or called mCAP, at the 5'-initiating terminal. The cap analog plays an important role in cellular processes, the initiation of protein synthesis, protecting RNA from exonuclease cleavage, uniquely recognition for recruiting protein factors for pre-mRNA splicing, polyadenylation and nuclear export. The cap could interact with different binding proteins, initiation factors and elements of ribosomes.

mCAP is the first cap analog for the molecular biology toolbox. MCAP inserts in the correct orientation to enhance translation with a 50% chance. The other 50% of molecules can't be a substrate for efficient translation, reducing the specific activity of the transcript.

mCAP can be incorporated in a transcription by including a mixture of the cap analog and GTP (usually at a 4:1 ratio). Approximately 80% of synthesized mRNA will possess a 5' cap, while the remaining 20% will possess a 5' triphosphate.

References:

[1].Abbas YM1, Laudenbach BT2, et al, Structure of human IFIT1 with capped RNA reveals adaptable mRNA binding and mechanisms for sensing N1 and N2 ribose 2'-O methylations. Proc Natl Acad Sci U S A. 2017 Mar 14;114(11):E2106-E2115.

Caution: Product has not been fully validated for medical applications. For research use only.

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- [2]. Katibah GE1, Qin Y2, et al, Broad and adaptable RNA structure recognition by the human interferon-induced tetratricopeptide repeat protein IFIT5. Proc Natl Acad Sci U S A. 2014 Aug 19;111(33):12025-30.
- [3]. Kuge H1, Brownlee GG, et al, Cap ribose methylation of c-mos mRNA stimulates translation and oocyte maturation in *Xenopus laevis*. Nucleic Acids Res. 1998 Jul 1;26(13):3208-14.
- [4]. Ramanathan A1, Robb GB1, et al, mRNA capping: biological functions and applications. Nucleic Acids Res. 2016 Sep 19;44(16):7511-26.
- [5]. Probst J1, Brechtel S, et al, Characterization of the ribonuclease activity on the skin surface. Genet Vaccines Ther. 2006 May 29;4:4.
- [6]. Karikó K1, Buckstein M, et al, Suppression of RNA recognition by Toll-like receptors: the impact of nucleoside modification and the evolutionary origin of RNA. Immunity. 2005 Aug;23(2):165-75.

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