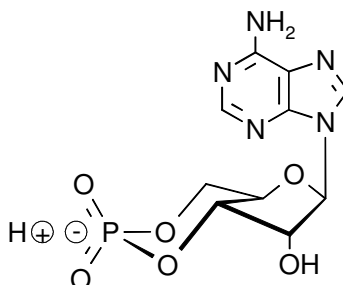


Technical Information about cyclic AMP

Activator of cAMP-dependent protein kinases, cAMP-gated ion channel, CAP and cAMP-GEFs

Update: October 18, 2007 TR



Abbreviation: cAMP

Formula	CAS No.	Molecular Weight	UV	BIOLOG Cat. No.
C ₁₀ H ₁₂ N ₅ O ₆ P	[60-92-4]	329.2	λ _{max} 258 nm / ε 15000 / pH 7	A 001 H

Name: Adenosine- 3', 5'- cyclic monophosphate (cyclic AMP), free acid

Description: Cyclic AMP is a natural messenger molecule (second messenger), present in almost every cellular system from bacteria to man.

Bulk Supply: cAMP can be offered in multigram quantities at extremely competitive prices. Please ask for a corresponding quotation.

Properties:

- activator of protein kinase A type I and II
- activator of cyclic AMP-gated ion channels
- activator of cyclic AMP-responsive guanine nucleotide exchange factor (Epac, GEF)
- activator of catabolite repressor protein (CAP/CRP)
- metabolized rapidly by cyclic nucleotide- responsive phosphodiesterases

Specification: Crystallized or lyophilized solid. Other salt forms of cAMP are available upon request. Equal concentrations of cAMP can appear very different in volume due to sensitivity of the lyophilized form to humidity. The compound can even contract to small volume droplets. Normally the product is located in the conical bottom of the tube. Micro molar quantities are determined by UV at λ_{max}.

Purity: Typical analysis is better than 98% (HPLC / UV / 258 nm). The product is not sterile and has not been tested for endotoxins.

Solubility: The solubility of the free acid form of cAMP in water is limited to approx. 7 mM. Please rinse tube walls carefully and preferably use ultrasonic or vortex to achieve total and uniform mixing. When opening the tube please make sure that no substance is lost within the cap.

Stability and Storage: cAMP is chemically very stable. Nevertheless, we recommend that the compound should be stored in the freezer, for longer storage periods preferably in freeze-dried form.

P.t.o.

Toxicity and Safety: Since cyclic AMP has multiple tasks in every organism it could possibly interfere with many cell regulation processes *in vivo*. However, due to the rather small quantities to work with, no health hazards have been reported. Nevertheless please keep in mind, that the *in vivo* properties of this compound are not sufficiently characterized up to now. Avoid skin contact or ingestion and allow only trained personnel to handle the product.

Our products are designed, developed and sold for research purposes only! They are intended for *in vitro* and nonhuman *in vivo* laboratory applications. Any other use requires approval of health authorities.

Not for drug, household or related uses!

Selected References for cyclic AMP: Since cAMP is a well known biochemical structure there exist numerous citations for almost every biosystem. The following papers give basic information on various aspects of this molecule.

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- 2 Finn, J.T.; Grunwald, M.E.; Yau, K.-W., *Annu. Rev. Physiol.*, **58**, 395 - 426 (1996): "Cyclic Nucleotide-Gated Ion Channels: An Extended Family With Diverse Functions"
- 3 Braumann, T.; Jastorff, B., *J. Chromatogr.*, **350**, 105 - 118 (1985): "Physicochemical Characterization of Cyclic Nucleotides by Reversed Phase High-Performance Liquid Chromatography. II. Quantitative Determination of Hydrophobicity"
- 4 de Rooij, J.; Zwartkruis, F.J.T.; Verheijen, M.H.G.; Cool, R.H.; Nijman, S.M.B.; Wittinghofer, A.; Bos, J.L., *Nature*, **396**, 474 - 477 (1998): "Epac is a Rap 1 Guanine-Nucleotide-Exchange Factor Directly Activated by Cyclic AMP"
- 5 Rich, T. C.; Fagan, K. A.; Tse, T. E.; Schaack, J.; Cooper, D. M. F.; Karpen, J. W., *Proc. Natl. Acad. Sci.*, **98**, 13049 - 13054 (2001): "A Uniform Extracellular Stimulus Triggers Distinct cAMP Signals in Different Compartments of a Simple Cell"
- 6 Kawasaki, H.; Springett, G.M.; Mochizuki, N.; Toki, S.; Nakaya, M.; Matsuda, M.; Housman, D.E.; Graybiel, A.M., *Science* **282**, 2275 - 2279 (1998): "A Family of cAMP-Binding Proteins That Directly Activate Rap1"
- 7 Mei, F. C.; Qiao, J.; Tsygankova, O.M.; Judy L. Meinkoth, J.L.; Quilliam, L.A.; Cheng, X., *J. Biol. Chem.*, **277**, 11497 - 11504 (2002): "Differential Signaling of cyclic AMP: Opposing Effects of Exchange Protein Directly Activated by cyclic AMP and cAMP-dependent Protein Kinase on Protein Kinase B Activation"
- 8 Kopperud, R.; Krakstad, C.; Selheim, F.; Døskeland, S. O., *FEBS Lett.*, **546**, 121 - 126 (2003): "cAMP Effector Mechanisms. Novel Twists for an 'Old' Signaling System"