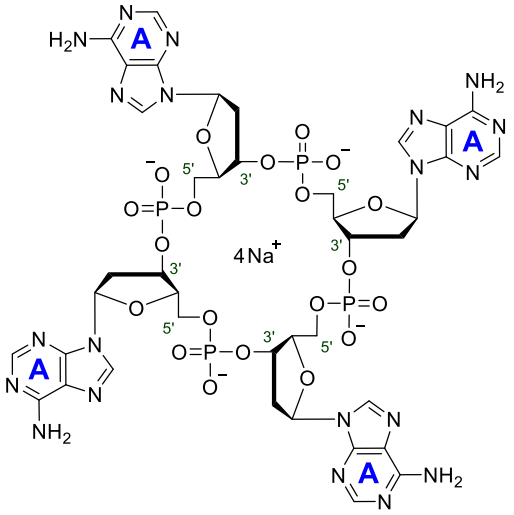
Technical Information about 2',2'',2''',2''''-Tetra-c-tetradAMP

Analogue of the bacterial second messenger c-tetraAMP

Update: January 25, 2024 ss



Abbreviation: **2',2'',2''',2''''-Tetra-c-tetradAMP**

Formula	CAS No.	Molecular Weight	UV	BIOLOG Cat. No.
$C_{40}0H_{48}N_{20}O_{20}P_4$ (free acid)	[125682-17-9]	1252.8 (free acid)	λ_{max} 259 nm / ε 54000 / pH 7	T 070

Name: 2'- , 2''-, 2''', 2''''- Tetradeoxy- cyclic tetraadenosine monophosphate (2',2'',2''',2''''-Tetra-c-tetradAMP), sodium salt
Syn.: cdA_4

Description: 2',2'',2''',2''''-Tetra-c-tetradAMP is a cyclic nucleotide in which four 2'-deoxy-modified 5'-AMP units are interconnected via 3'-5' phosphodiester bonds to form a cyclic structure.

Properties: Cyclic oligoadenylates such as c-tetraAMP (Biolog Cat. No. C 335) were found to be novel bacterial second messengers involved in the Type III CRISPR-Cas-associated detection and degradation of invasive genetic elements in many prokaryotes.
2',2'',2''',2''''-Tetra-c-tetradAMP is an analogue of c-tetraAMP containing deoxy modifications in all ribose 2'-positions, which are expected to make the compound resistant to degradation by nucleases.

Specification: Crystallized or lyophilized sodium salt. Please keep in mind that equal concentrations of the compound may look 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. Micromolar quantities are determined by UV at λ_{max}.

Purity: Typical analysis is better than 95% (HPLC / UV / 259 nm). The product is not sterile and has not been tested for endotoxins.

Solubility: 2',2'',2''',2''''-Tetra-O-Me-c-tetraAMP is soluble in water and aqueous buffers (≥ 6.2 mM, limits have not been determined). 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: 2',2'',2''',2''''-Tetra-c-tetradAMP has sufficient stability at room temperature and does not need special care during handling or shipment. Nevertheless, we recommend that the compound should be stored in the freezer, for longer storage periods preferably in freeze-dried form.

Toxicity and Safety: Please keep in mind, that the *in vivo* properties of this compound are not sufficiently characterized up to now. Avoid contact with eyes and skin 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!

Biolog Life Science Institute, Bremen, Germany Phone: 49 (0) 421 591355 Fax: 49 (0) 421 5979713 e-mail: service@biolog.de

Reference for 2',2'',2''',2''''-Tetra-c-tetradAMP:

Jia, N.; Jones, R.; Yang, G.; Ouerfelli, O.; Patel, D. J., *Mol. Cell.*, **75**, 944 - 956 (2019): "CRISPR-Cas III-A Csm6 CARF Domain Is a Ring Nuclease Triggering Stepwise cA_4 Cleavage with ApA>p Formation Terminating RNase Activity"

Selected References for the Parent Compound c-tetraAMP:

Molina, R.; Stella, S.; Feng, M.; Sofos, N.; Jauniskis, V.; Pozdnyakova, I.; López-Méndez, B.; She, Q.; Montoya, G., *Nat. Commun.*, **10**(1):4302 (2019): "Structure of Csx1-cOA4 Complex Reveals the Basis of RNA Decay in Type III-B CRISPR-Cas"

Athukoralage, J.S.; Rouillon, C.; Graham, S.; Grüschow, S.; White, M.F., *Nature,* **562**, 277 - 280 (2018): "Ring Nucleases Deactivate Type III CRISPR Ribonucleases by Degrading Cyclic Oligoadenylate"

Rouillon, C.; Athukoralage, J.S.; Graham, S.; Grüschow, S.; White, M.F., *eLife* 2018;7:e36734 doi: 10.7554/eLife.36734: "Control of Cyclic Oligoadenylate Synthesis in a Type III CRISPR System"

Kazlauskiene, M.; Kostiuk, G.; Venclovas, Č.; Tamulaitis, G.; Siksnys, V., *Science*, **357**, 605 - 609 (2017): "A Cyclic Oligonucleotide Signaling Pathway in Type III CRISPR-Cas Systems"

Niewoehner, O.; Garcia-Doval, C.; Rostøl, J.T.; Berk, C.; Schwede, F.; Bigler, L.; Hall, J.; Marraffini, L.A.; Jinek, M., *Nature*, **548**, 543 - 548 (2017): "Type III CRISPR-Cas Systems Produce Cyclic Oligoadenylate Second Messengers"

Biolog Life Science Institute, Bremen, Germany Phone: 49 (0) 421 591355 Fax: 49 (0) 421 5979713 e-mail: service@biolog.de