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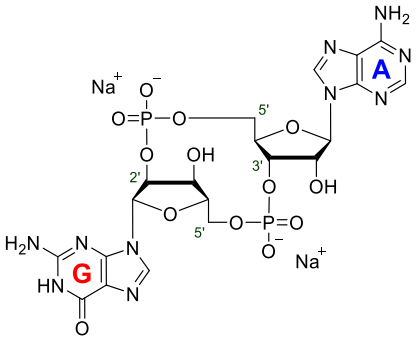
Technical Information about c[G(2',5')pA(3',5')p]

Metazoan cyclic dinucleotide second messenger

Update: September 10, 2021 cw



Abbreviation: **c[G(2',5')pA(3',5')p]**

Formula	CAS No.	Molecular Weight	UV	BIOLOG Cat. No.
$C_{20}H_{24}N_{10}O_{13}P_2$ (free acid)	[1441190-66-4]	674.4 (free acid)	λ_{max} 256 nm / ε 25050 / pH 7	C 161

Name: Cyclic (guanosine- (2' → 5')- monophosphate- adenosine- (3' → 5')- monophosphate)
Syn.: cGAMP(2'-5') / 2'3'-cGAMP / 2',5'-3',5'-cGAMP

Description: c[G(2',5')pA(3',5')p] is a non-canonical cyclic dinucleotide in which a 5'-GMP unit is connected with a 5'-AMP unit via a 2'-5' and a 3'-5' phosphodiester bond to form a cyclic structure.

Properties: c[G(2',5')pA(3',5')p] was found to be the metazoan second messenger produced by the mammalian innate immune DNA sensor cGAMP synthase (cGAS). It has also been reported to exert potent activation of the immune signalling protein STING.

cGAS was discovered by Sun et al. (2013) to be a cytosolic DNA sensor in mammals, and was initially described to produce 3',5'-linked cGAMP (c[G(3',5')pA(3',5')p], our Cat. No. C 117). More recent studies identified endogenous cGAMP in mammalian cells to contain two distinct phosphodiester linkages (Gao, P.; Ascano, M. et al. 2013, Ablasser, A.; Goldeck, M. et al. 2013, Zhang et al. 2013, Diner et al. 2013).

Infection by HIV or other retroviruses activates cGAS to produce c[G(2',5')pA(3',5')p] which induces type I interferons and other cytokines via STING (Gao, D.; Wu, J. et al. 2013). Since c[G(2',5')pA(3',5')p] is a more potent ligand of STING than bacterial cyclic dinucleotides such as c-diGMP or c-diAMP, it may be superior to c-diGMP and c-diAMP for development of a potential vaccine adjuvant (Li et al. 2013).

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. Micro molar quantities are determined by UV at λ_{max}.

Purity: Typical analysis is better than 98% (HPLC / UV / 256 nm). The product is not sterile and has not been tested for endotoxins.

Solubility: c[G(2',5')pA(3',5')p] is easily soluble in water and aqueous buffers (≥ 100 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: c[G(2',5')pA(3',5')p] 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 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!

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