Product Data Sheet

Product Name: cGAMP (Cyclic AMP-GMP)
Cat. No.: GC31696

Chemical Properties

Cas. No.	849214-04-6		
SMILES	O=P(O[C@H]1[C@@H](O)[C@H](N2C=NC3=C2N=CN=C3N)O[C@@H]1COP4(O)=O)(O)OC[C@@H]5[C@@H](O4)[C@@H](O)[C@H](N6C=NC7=C6N=C(N)NC7=O)O5		
Formula	$C_{20}H_{24}N_{10}O_{13}P_2$	M.Wt	674.41
Solubility	Water : 20 mg/mL (29.66 mM)	Storage	Store at -20°C
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	cGAMP (Cyclic AMP-GMP)		

Protocol

Cell experiment [1]:

Cell lines	Murine bone marrow-derived dendritic cells, human PBMC-derived dendritic cells
Preparation Method	Murine bone marrow-derived dendritic cells (DCs) and human PBMC-derived DCs were stimulated in vitro with c-di-AMP, cGAMP (both at 5mg/mL or 60mg/mL) or left untreated (mock) for 24h. The dendritic cells were decorated with fluorophore-conjugated antibodies against the DC activation markers CD40, CD54, CD80, CD83, CD86 or MHC class II (I-Ab) and analyzed by flow cytometry.

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com
Address: 10292 Central Ave. #205, Montclair, CA, USA

Product Data Sheet

Reaction Conditions	5mg/mL, 60mg/mL; 24h
Applications	cGAMP directly activates murine and human dendritic cells in vitro. The purity of the tested cell populations with respect to $CD11c^+$ cells was 95% for the human PBMC derived DCs and 82% for the mouse bone marrow-derived DCs.

Animal experiment [1]:

Animal models	Female C57BL/6 (H-2b) mice
Preparation Method	Mouse immunization experiments Five animals per group were immunized intra-nasal (i. n.) on days 0, 14 and 28. Animals were anesthetized with Isoflurane and treated 10mL per nostril with 15μg ovalbumin (OVA) alone or co-adminis tered with 5μg per dose of c-di-AMP, cGAMP or cholera toxin B subunit (CTB) in Ampuwa or with Ampuwa alone in the control group (mock immunization). On day 42 after immunization animals were sacrificed and samples were collected.
Dosage form	5μg; intra-nasal (i. n.)
Applications	The cGAMP-dependent enhanced specific IgG and IgA titers in our mouse immunization experiments suggest that the use of cGAMP promotes the antigen-specific humoral immune response. Spleen cells from mice immunized with cGAMP-adjuvanted antigen showed a facilitated antigen-specific proliferation capacity.

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com
Address: 10292 Central Ave. #205, Montclair, CA, USA

References:
[1] Škrnjug I, Guzmán C A, Ruecker C. Cyclic GMP-AMP displays mucosal adjuvant activity in mice[J]. PloS one, 2014, 9(10): e110150.

Background

cGAMP (Cyclic AMP-GMP) is a cyclic dinucleotide that acts as a second messenger in mammalian cells and is synthesized "on demand" when cells are threatened[1, 2]. cGAMP activates the stimulator of interferon genes (STING), triggering a signaling cascade that leads to the production of type I interferons and other immune mediators[3]. Under cGAMP stimulation, cells show increased IFNB1 transcription, but no abnormal transcription of genes encoding interleukin-1 (IL1), interleukin-6 (IL6), or tumor necrosis factor (TNF)[4].

In vitro, treatment of mouse bone marrow-derived dendritic cells and human peripheral blood mononuclear cell-derived dendritic cells with cGAMP (5mg/mL, 60mg/mL) for 24h directly activated both mouse and human dendritic cells. The purity of $CD11c^+$ cells in the tested cell populations was 95% for human peripheral blood mononuclear cell-derived dendritic cells and 82% for mouse bone marrow-derived dendritic cells[5].

In vivo, cGAMP (5μg) administered as a nasal mucosal adjuvant to immunized mice promoted antigen-specific proliferation of mouse splenocytes and enhanced antigen-specific humoral immune responses[5].

References:
[1] Liu Y, Fei Y, Wang X, et al. Biomaterial-enabled therapeutic modulation of cGAS-STING signaling for enhancing antitumor immunity[J]. Molecular Therapy, 2023, 31(7): 1938-1959.

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com
Address: 10292 Central Ave. #205, Montclair, CA, USA

[2] Su Y. Development of Riboswitch-based Sensors for High-throughput Enzyme Activity Screens[M]. University of California, Berkeley, 2018.
[3] Kaushal A. A central role of stimulator of interferon genes’ adaptor protein in defensive immune response[J]. Immunologic Research, 2025, 73(1): 39.
[4] Liu Y, Jesus A A, Marrero B, et al. Activated STING in a vascular and pulmonary syndrome[J]. New England Journal of Medicine, 2014, 371(6): 507-518.
[5] Škrnjug I, Guzmán C A, Ruecker C. Cyclic GMP-AMP displays mucosal adjuvant activity in mice[J]. PloS one, 2014, 9(10): e110150.

Tel: (909) 407-4943 Fax: (626) 353-8530 E-mail: tech@glpbio.com
Address: 10292 Central Ave. #205, Montclair, CA, USA