**PRODUCT INFORMATION**

**Content:**
- 1 mg (2 x 500 μg) lyophilized 2′3′-cGAMP VacciGrade™
- 10 ml sterile endotoxin-free physiological water (NaCl 0.9%)

**Storage and stability:**
- 2′3′-cGAMP VacciGrade™ is shipped at room temperature and should be stored at -20°C. Lyophilized product is stable for 1 year when properly stored.
- Upon resuspension, prepare aliquots of 2′3′-cGAMP VacciGrade™ and store at -20°C. Resuspended product is stable for 6 months when properly stored. Avoid repeated freeze-thaw cycles.

**Quality control:**
- 2′3′-cGAMP VacciGrade™ is a preclinical grade preparation of the cyclic dinucleotide 2′3′-cGAMP. It is prepared under strict aseptic conditions and is tested for the presence of endotoxins. 2′3′-cGAMP VacciGrade™ is guaranteed sterile and its endotoxin level is <0.005 EU/μg.
- Purity and structure has been determined by LC/MS and NMR: ≥ 95%
- Biological activity has been assessed by measuring induction of the interferon pathway in cells.

**METHODS**

**Preparation of stock solution (1 mg/ml):**
- Add 500 μl sterile endotoxin-free physiological water (provided) to 500 μg 2′3′-cGAMP VacciGrade™.
- Mix the solution by pipetting up and down.

**Working Concentration:** 5 - 50 μg/mouse

**CHEMICAL PROPERTIES**

**Synonym:** cyclic GMP-AMP; c-GpAp sodium salt

**Formula:** C_{20}H_{22}N_{10}O_{13}P_{2}·2Na

**Molecular weight:** 718.38

**Solubility:** 50 mg/ml in physiological water

**Source:** Synthetic

**Structure:**

![Structure of 2′3′-cGAMP](image)

**DESCRIPTION**

2′3′-cGAMP (cyclic [G(2′,5′)pA(3′,5′)p]) is a cyclic dinucleotide produced in mammalian cells by cGAS (cGAMP synthase) in response to double-stranded DNA in the cytoplasm. Cyclic dinucleotides (CDNs) are a relatively new class of adjuvants that have been shown to increase vaccine potency. CDNs activate innate immunity by directly binding the endoplasmic reticulum-resident receptor STING (stimulator of interferon genes), activating a signaling pathway that induces the expression of interferon-β (IFN-β) and also nuclear factor-kB (NF-kB) dependent inflammatory cytokines.

2′3′-cGAMP is also referred to as “noncanonical” cGAMP due to the presence of the atypical 2′-5′ phosphodiester linkage between the guanosine and the adenosine. Structural and functional studies revealed that noncanonical 2′3′-cGAMP is distinct from the canonical 3′3′-cGAMP produced by bacteria. Certain variants of STING are able to distinguish between noncanonical and canonical cGAMP.

Similar to the canonical 3′3′-cGAMP, 2′3′-cGAMP serves as a second messenger to activate innate immune responses by binding to STING and subsequently inducing the TBK1-IRF3 (TANK-binding kinase 1-IFN regulatory transcription factor)-dependent production of IFN-β. Recently, it has been reported that 2′3′-cGAMP is an effective adjuvant that boosts the production of antigen-specific antibodies and T cell responses in mice.


**RELATED PRODUCTS**

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<td>Alhydrogel® 2%</td>
<td>Al(OH)3 gel</td>
<td>vac-alu-250</td>
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<td>c-di-GMP VacciGrade™</td>
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<td>CFA</td>
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<td>ODN 2006 VacciGrade™</td>
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<td>Poly(I:C) VacciGrade™</td>
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**TECHNICAL SUPPORT**

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