

# PRODUCT INFORMATION



## cGAS (human, recombinant)

Item No. 22810

### Overview and Properties

**Synonyms:** C6orf150, 2'3'-cGAMP Synthase, cGAMP Synthase, h-cGAS, Cyclic GMP-AMP Synthase, EC: 2.7.7.86, Mab-21 domain containing protein 1, MB21D1

**Source:** Active recombinant N-terminal His-tagged protein expressed in *E. coli*

**Amino acids:** 2-543 (full length)

**Uniprot No.:** Q8N884

**Molecular Weight:** 61 kDa

**Storage:** -80°C (as supplied)

**Stability:** ≥1 year

**Purity:** *batch specific* (≥90% estimated by SDS-PAGE)

**Supplied in:** 50 mM HEPES, pH 8.0, with 300 mM sodium chloride, and 10% glycerol

**Protein concentration:** *batch specific* mg/ml

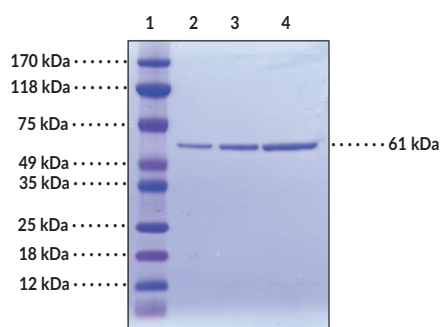
**Activity:** *batch specific* U/ml

**Specific Activity:** *batch specific* U/mg

**Unit Definition:** One unit of cGAS produces 1 nmole of cGAMP per minute at 37°C in 80 mM Tris-HCL, pH 7.5, containing 200 mM NaCl, 20 μM ZnCL<sub>2</sub>, and 20 mM MgCl<sub>2</sub> with 4 μg circular DNA (3623 bp) and 0.25 mM each of GTP and ATP.

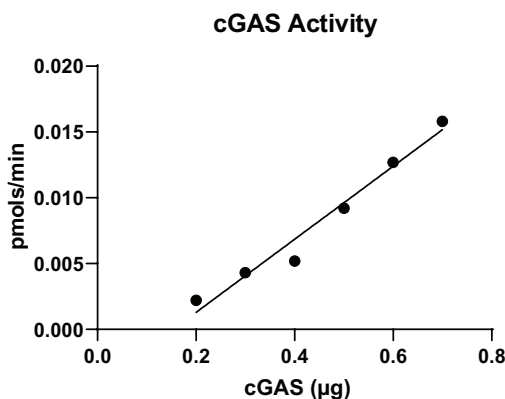
Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

### Images



Lane 1: MW Markers  
Lane 2: cGAS (1 μg)  
Lane 3: cGAS (2 μg)  
Lane 4: cGAS (4 μg)

Representative gel image shown; actual purity may vary between batches.



cGAS production of cGAMP was detected using Cayman's 2'3'-cGAMP ELISA Kit (Item No. 501700)

WARNING  
THIS PRODUCT IS FOR RESEARCH ONLY - NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

SAFETY DATA  
This material should be considered hazardous until further information becomes available. Do not ingest, inhale, get in eyes, on skin, or on clothing. Wash thoroughly after handling. Before use, the user must review the complete Safety Data Sheet, which has been sent via email to your institution.

WARRANTY AND LIMITATION OF REMEDY  
Buyer agrees to purchase the material subject to Cayman's Terms and Conditions. Complete Terms and Conditions including Warranty and Limitation of Liability information can be found on our website.

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CAYMAN CHEMICAL  
1180 EAST ELLSWORTH RD  
ANN ARBOR, MI 48108 · USA  
PHONE: [800] 364-9897  
[734] 971-3335  
FAX: [734] 971-3640  
CUSTSERV@CAYMANCHEM.COM  
WWW.CAYMANCHEM.COM

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## Description

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Cyclic GMP-AMP (cGAMP) synthase (cGAS) is a nucleotidyltransferase located in the cytosol that acts as a cytosolic DNA sensor to detect foreign DNA from microbial pathogens as part of the innate immune response.<sup>1,2</sup> Upon binding to cytosolic DNA, cGAS produces the cyclic dinucleotide second messenger cGAMP, which activates stimulator of interferon genes (STING), leading to activation of the type I interferon (IFN) pathway.<sup>1-3</sup> *In vitro*, fibroblasts, macrophages, and dendritic cells isolated from cGAS knockout (cGAS<sup>-/-</sup>) mice do not produce type I IFNs following DNA transfection or DNA virus infection.<sup>4</sup> Similarly, cells containing a frame-shift mutation in the cGAS locus fail to mount an immune response to HIV and other retroviruses.<sup>5</sup> *In vivo*, cGAS<sup>-/-</sup> mice infected with herpes simplex virus 1 (HSV-1) have lower levels of IFN- $\alpha$  and IFN- $\beta$ , shorter survival times, and higher post-mortem levels of HSV-1 in the brain.<sup>4</sup>

## References

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1. Sun, L., Wu, J., Du, F., *et al.* Cyclic GMP-AMP synthase is a cytosolic DNA sensor that activates the type I interferon pathway. *Science* **339(6121)**, 786-791 (2013).
2. Wu, J., Sun, L., Chen, X., *et al.* Cyclic GMP-AMP is an endogenous second messenger in innate immune signaling by cytosolic DNA. *Science* **339(6121)**, 826-830 (2013).
3. Ablasser, A., Goldeck, M., Cavlar, T., *et al.* cGAS produces a 2'-5'-linked cyclic dinucleotide second messenger that activates STING. *Nature* **498(7454)**, 380-384 (2013).
4. Li, X.-D., Wu, J., Gao, D., *et al.* Pivotal roles of cGAS-cGAMP signaling in antiviral defense and immune adjuvant effects. *Science* **341(6152)**, 1390-1394 (2013).
5. Gao, D., Wu, J., Wu, Y.-T., *et al.* Cyclic GMP-AMP synthase is an innate immune sensor of HIV and other retroviruses. *Science* **341(6148)**, 903-906 (2013).

CAYMAN CHEMICAL  
1180 EAST ELLSWORTH RD  
ANN ARBOR, MI 48108 · USA  
PHONE: [800] 364-9897  
[734] 971-3335  
FAX: [734] 971-3640  
CUSTSERV@CAYMANCHEM.COM  
WWW.CAYMANCHEM.COM