PRODUCT INFORMATION

cGAS (161-522) (human recombinant)

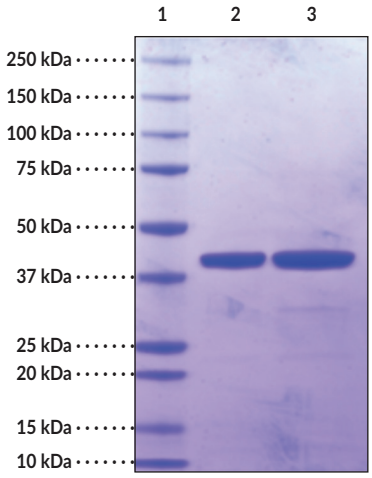
Item No. 25001

Overview and Properties

Synonyms:	C6orf150, 2'3'-cGAMP Synthase, cGAMP Synthase, h-cGAS, Cyclic GMP-AMP Synthase, Mab-21 domain-containing protein 1, MB21D1
Source:	N-terminal histidine-tagged human cGAS protein (truncated), purified from *E. coli*
Amino Acids:	161-522
Uniprot No.:	Q8N884
Molecular Weight:	44.6 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, 150 mM sodium chloride, 1 mM DTT, and 10% glycerol
Protein Concentration:	***batch specific*** mg/ml

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

Image



Lane 1: MW Markers
Lane 2: cGAS (161-522) (2 µg)
Lane 3: cGAS (161-522) (4 µg)

Representative gel image shown; actual purity may vary between each batch.

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Description

Cyclic GMP-AMP (cGAMP) synthase (cGAS) (161-522) is a truncated form of cGAS (Item No. 22810) that contains the nucleotidyltransferase and Mab21 domains.[1] 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.[2,3] 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.[2-4] *In vitro*, fibroblasts, macrophages, and dendritic cells isolated from cGAS knockout (cGAS$^{-/-}$) mice do not produce type I IFNs following DNA transfection or DNA virus infection.[5] Similarly, cells containing a frame-shift mutation in the cGAS locus fail to mount an immune response to HIV and other retroviruses.[6] *In vivo*, cGAS$^{-/-}$ mice infected with herpes simplex virus 1 (HSV-1) have lower levels of IFN-α and IFN-β, shorter survival times, and higher post-mortem levels of HSV-1 in the brain.[5]

References

1. Tao, J., Zhang, X.-W., Jin, J., *et al.* Nonspecific DNA Binding of cGAS N Terminus Promotes cGAS Activation. *J. Immunol.* **198(9)**, 3627-3636 (2017).
2. 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).
3. 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).
4. 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).
5. 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).
6. 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).

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