SANTA CRUZ BIOTECHNOLOGY, INC.

cGAS (D-9): sc-515777

SANTA CRUZ BIOTECHNOLOGY

The Power to Question

BACKGROUND

The presence of foreign DNA in the cytoplasm induces an antiviral host immune response. DNA in the cytoplasm triggers the production of interferons by activating and synthesis of second messenger cyclic guanosine monophosphate-adenosine monophosphate (cyclic GMP-AMP, or cGAMP). cGAS (cyclic GMP-AMP synthase), also known as MB21D1 (Mab-21 domain containing 1), h-cGAS or C6orf150, is a 522 amino acid cytoplasmic nucleotidyltransferase that catalyzes the formation of cyclic GMP-AMP (cGAMP) from ATP and GTP. cGAS is suggested to have antiviral activity by acting as a key cytosolic DNA sensor. cGAS binds to cytosolic DNA, which leads to cGAMP synthesis and activation of TMEM173, thereby trigger type-I interferon production. Expressed in monocytic cell line THP1, cGAS exists as two alternatively spliced isoforms and is encoded by a gene located on human chromosome 6q13.

CHROMOSOMAL LOCATION

Genetic locus: MB21D1 (human) mapping to 6q13.

SOURCE

cGAS (D-9) is a mouse monoclonal antibody specific for an epitope mapping between amino acids 19-42 near the N-terminus of cGAS of human origin.

PRODUCT

Each vial contains 200 µg IgG_{2a} kappa light chain in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

cGAS (D-9) is available conjugated to agarose (sc-515777 AC), 500 µg/0.25 ml agarose in 1 ml, for IP; to HRP (sc-515777 HRP), 200 µg/ml, for WB, IHC(P) and ELISA; to either phycoerythrin (sc-515777 PE), fluorescein (sc-515777 FITC), Alexa Fluor® 488 (sc-515777 AF488), Alexa Fluor® 546 (sc-515777 AF546), Alexa Fluor® 594 (sc-515777 AF594) or Alexa Fluor® 647 (sc-515777 AF647), 200 µg/ml, for WB (RGB), IF, IHC(P) and FCM; and to either Alexa Fluor® 680 (sc-515777 AF680) or Alexa Fluor® 790 (sc-515777 AF790), 200 µg/ml, for Near-Infrared (NIR) WB, IF and FCM.

Alexa Fluor® is a trademark of Molecular Probes, Inc., Oregon, USA

APPLICATIONS

cGAS (D-9) is recommended for detection of cGAS of human origin by Western Blotting (starting dilution 1:100, dilution range 1:100-1:1000), immunoprecipitation [1-2 µg per 100-500 µg of total protein (1 ml of cell lysate)], immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500), immunohistochemistry (including paraffin-embedded sections) (starting dilution 1:50, dilution range 1:50-1:500) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000); Not recommended for detection of cGAS of mouse and rat origin. May cross-react with an unknown protein of similar size in mouse and rat.

Suitable for use as control antibody for cGAS siRNA (h): sc-95512, cGAS shRNA Plasmid (h): sc-95512-SH and cGAS shRNA (h) Lentiviral Particles: sc-95512-V.

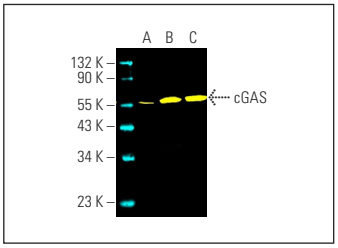
Molecular Weight of cGAS: 60 kDa.

Positive Controls: RT-4 whole cell lysate: sc-364257, T24 cell lysate: sc-2292 or THP-1 cell lysate: sc-2238.

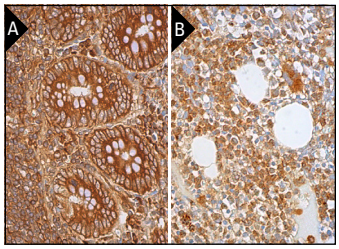
STORAGE

Store at 4° C, **DO NOT FREEZE**. Stable for one year from the date of shipment. Non-hazardous. No MSDS required.

DATA



cGAS (D-9) Alexa Fluor® 488: sc-515777 AF488. Direct fluorescent western blot analysis of cGAS expression in THP-1 (**A**), T24 (**B**) and RT-4 (**C**) whole cell lysates. Blocked with UltraCruz® Blocking Reagent: sc-516214. Cruz Marker™ Molecular Weight Standards detected with Cruz Marker MW Tag-Alexa Fluor® 647: sc-516791.



cGAS (D-9): sc-515777. Immunoperoxidase staining of formalin fixed, paraffin-embedded human appendix tissue showing cytoplasmic staining of glandular cells and lymphoid cells (**A**). Immunoperoxidase staining of formalin fixed, paraffin-embedded human bone marrow tissue showing cytoplasmic staining of hematopoietic cells (**B**).

SELECT PRODUCT CITATIONS

1. Prabakaran, T., et al. 2018. Attenuation of cGAS-STING signaling is mediated by a p62/SQSTM1-dependent autophagy pathway activated by TBK1. EMBO J. 37: e97858.
2. Maekawa, H., et al. 2019. Mitochondrial damage causes inflammation via cGAS-STING signaling in acute kidney injury. Cell Rep. 29: 1261-1273.e6.
3. Zhao, B., et al. 2020. Topoisomerase 1 cleavage complex enables pattern recognition and inflammation during senescence. Nat. Commun. 11: 908.
4. Sharma, M., et al. 2020. Cyclic GMP-AMP synthase promotes the inflammatory and autophagy responses in Huntington disease. Proc. Natl. Acad. Sci. USA 117: 15989-15999.
5. Zhang, Q., et al. 2020. USP29 maintains the stability of cGAS and promotes cellular antiviral responses and autoimmunity. Cell Res. 30: 914-927.
6. Yu, C.H., et al. 2020. TDP-43 triggers mitochondrial DNA release via mPTP to activate cGAS/STING in ALS. Cell 183: 636-649.e18.
7. Li, C., et al. 2021. RNF111-facilitated neddylation potentiates cGAS-mediated antiviral innate immune response. PLoS Pathog. 17: e1009401.
8. Chen, X., et al. 2021. Regulation of anion channel LRRC8 volume-regulated anion channels in transport of 2'3'-cyclic GMP-AMP and cisplatin under steady state and inflammation. J. Immunol. 206: 2061-2074.
9. Yao, M., et al. 2021. Autophagy-mediated clearance of free genomic DNA in the cytoplasm protects the growth and survival of cancer cells. Front. Oncol. 11: 667920.
10. Comish, P.B., et al. 2022. The cGAS-STING pathway connects mitochondrial damage to inflammation in burn-induced acute lung injury in rat. Burns 48: 168-175.

RESEARCH USE

For research use only, not for use in diagnostic procedures.