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CF150 Antibody (Center)

Affinity Purified Rabbit Polyclonal Antibody (Pab)

Catalog # AP10510c

Specification

CF150 Antibody (Center) - Product Information

Application	**WB, FC,E**
Primary Accession	Q8N884
Other Accession	NP_612450.2
Reactivity	**Human**
Host	**Rabbit**
Clonality	**Polyclonal**
Isotype	**Rabbit IgG**
Antigen Region	**266-295**

CF150 Antibody (Center) - Additional Information

Gene ID 115004

Other Names
Cyclic GMP-AMP synthase, cGAMP synthase, cGAS, h-cGAS, Mab-21 domain-containing protein 1, MB21D1, C6orf150

Target/Specificity
This CF150 antibody is generated from rabbits immunized with a KLH conjugated synthetic peptide between 266-295 amino acids from the Central region of human CF150.

Dilution
WB~~1:1000
FC~~1:25
E~~Use at an assay dependent concentration.

Format
Purified polyclonal antibody supplied in PBS with 0.09% (W/V) sodium azide. This antibody is purified through a protein A column, followed by peptide affinity purification.

Storage
Maintain refrigerated at 2-8°C for up to 2 weeks. For long term storage store at -20°C in small aliquots to prevent freeze-thaw cycles.

Precautions
CF150 Antibody (Center) is for research use only and not for use in diagnostic or therapeutic procedures.

CF150 Antibody (Center) - Protein Information

Name CGAS {ECO:0000303|PubMed:23258413, ECO:0000312|HGNC:HGNC:21367}

Function Nucleotidyltransferase that catalyzes the formation of cyclic GMP-AMP (2',3'-cGAMP) from ATP and GTP and plays a key role in innate immunity (PubMed:21478870, PubMed:23258413, PubMed:23707061, PubMed:23707065, PubMed:23722159, PubMed:24077100, PubMed:24116191, PubMed:24462292, PubMed:25131990, PubMed:26300263, PubMed:29976794, PubMed:30799039, PubMed:31142647, PubMed:32814054, PubMed:33273464, PubMed:33542149, PubMed:37217469, PubMed:37802025). Catalysis involves both the formation of a 2',5' phosphodiester linkage at the GpA step and the formation of a 3',5' phosphodiester linkage at the ApG step, producing c[G(2',5')pA(3',5')p] (PubMed:28214358, PubMed:28363908). Acts as a key DNA sensor: directly binds double-stranded DNA (dsDNA), inducing the formation of liquid-like droplets in which CGAS is activated, leading to synthesis of 2',3'-cGAMP, a second messenger that binds to and activates STING1, thereby triggering type-I interferon production (PubMed:28314590, PubMed:28363908, PubMed:29976794, PubMed:32817552, PubMed:33230297, PubMed:33606975, PubMed:35322803, PubMed:35438208, PubMed:35460603, PubMed:35503863). Preferentially recognizes and binds curved long dsDNAs of a minimal length of 40 bp (PubMed:30007416). Acts as a key foreign DNA sensor, the presence of double-stranded DNA (dsDNA) in the cytoplasm being a danger signal that triggers the immune responses (PubMed:28363908). Has antiviral activity by sensing the presence of dsDNA from DNA viruses in the cytoplasm (PubMed:28363908, PubMed:35613581). Also acts as an innate immune sensor of infection by retroviruses, such as HIV-2, by detecting the presence of reverse-transcribed DNA in the cytosol (PubMed:23929945, PubMed:24269171, PubMed:30270045, PubMed:32852081). In contrast, HIV-1 is poorly sensed by CGAS, due to its capsid that cloaks viral DNA from CGAS detection (PubMed:24269171, PubMed:30270045, PubMed:32852081). Detection of retroviral reverse-transcribed DNA in the cytosol may be indirect and be mediated via interaction with PQBP1, which directly binds reverse-transcribed retroviral DNA (PubMed:26046437). Also detects the presence of DNA from bacteria, such as M.tuberculosis (PubMed:26048138). 2',3'-cGAMP can be transferred from producing cells to neighboring cells through gap junctions, leading to promote STING1 activation and convey immune response to connecting cells (PubMed:24077100). 2',3'-cGAMP can also be transferred between cells by virtue of packaging within viral particles contributing to IFN- induction in newly infected cells in a cGAS-independent but STING1- dependent manner (PubMed:26229115). Also senses the presence of neutrophil extracellular traps (NETs) that are translocated to the cytosol following phagocytosis, leading to synthesis of 2',3'-cGAMP (PubMed:33688080). In addition to foreign DNA, can also be activated by endogenous nuclear or mitochondrial DNA (PubMed:28738408, PubMed:28759889, PubMed:31299200, PubMed:33031745, PubMed:33230297). When self-DNA leaks into the cytosol during cellular stress (such as mitochondrial stress, SARS-CoV-2 infection causing severe COVID-19 disease, DNA damage, mitotic arrest or senescence), or is present in form of cytosolic micronuclei, CGAS is activated leading to a state of sterile inflammation (PubMed:28738408, PubMed:28759889, PubMed:31299200, PubMed:33031745, PubMed:33230297, PubMed:35045565). Acts as a regulator of cellular senescence by binding to cytosolic chromatin fragments that are present in senescent cells, leading to trigger type-I interferon production via STING1 and promote cellular senescence (By similarity). Also involved in the inflammatory response to genome instability and double-stranded DNA breaks: acts by localizing to micronuclei arising from genome instability (PubMed:28738408, PubMed:28759889). Micronuclei, which are frequently found in cancer cells, consist of chromatin surrounded by their own nuclear membrane: following breakdown of the micronuclear envelope, a process associated with chromothripsis, CGAS binds self-DNA exposed to the cytosol, leading to 2',3'-cGAMP synthesis and subsequent activation of STING1 and type-I interferon production (PubMed:28738408, PubMed:28759889). Activated in response to prolonged mitotic arrest, promoting mitotic cell death (PubMed:31299200). In a healthy cell, CGAS is however kept inactive even in cellular events that directly expose it to self-DNA, such as mitosis, when cGAS associates with chromatin directly after nuclear envelope breakdown or remains in the form of postmitotic persistent nuclear cGAS pools bound to chromatin (PubMed:31299200, PubMed:33542149). Nuclear CGAS is inactivated by chromatin via direct interaction with nucleosomes, which block CGAS from DNA binding and thus prevent CGAS-induced autoimmunity (PubMed:31299200, PubMed:32911482, PubMed:32912999, PubMed:33051594, PubMed:33542149). Also acts as a suppressor of DNA repair in response to DNA damage: inhibits homologous recombination repair by interacting with PARP1, the CGAS-PARP1 interaction leading to impede the formation of the PARP1-TIMELESS complex

(PubMed:30356214, PubMed:31544964). In addition to DNA, also sense translation stress: in response to translation stress, translocates to the cytosol and associates with collided ribosomes, promoting its activation and triggering type-I interferon production (PubMed:34111399). In contrast to other mammals, human CGAS displays species-specific mechanisms of DNA recognition and produces less 2',3'-cGAMP, allowing a more fine-tuned response to pathogens (PubMed:30007416).

Cellular Location
Nucleus. Chromosome. Cell membrane; Peripheral membrane protein. Cytoplasm, cytosol. Note=Mainly localizes in the nucleus, and at low level in the cytosol (PubMed:31544964, PubMed:31808743). On chromosomes, enriched on centromeric satellite and LINE DNA repeat elements (PubMed:30811988). Exported from the nucleus to the cytosol in a XPO1/CRM1 via the nuclear export signal in response to DNA stimulation (PubMed:33406424). Outside the nucleus, localizes at the cell membrane as a peripheral membrane protein in resting conditions: association to the cell membrane is mediated via binding to phosphatidylinositol 4,5-bisphosphate (PtdIns(4,5)P2) (PubMed:30827685). Localization at the cell membrane is required to limit the recognition of self-DNA (PubMed:30827685). Following detection of double-stranded DNA (dsDNA), released from the cell membrane into the cytosol in order to signal (PubMed:30827685). Upon transfection with dsDNA forms punctate structures that co-localize with DNA and Beclin-1 (BECN1) (PubMed:26048138). Phosphorylation at Tyr-215 promotes cytosolic retention (PubMed:30356214). In response to translation stress, translocates to the cytosol and associates with collided ribosomes (PubMed:34111399).

Tissue Location
Expressed in the monocytic cell line THP1.

CF150 Antibody (Center) - Protocols

Provided below are standard protocols that you may find useful for product applications.

- Western Blot
- Blocking Peptides
- Dot Blot
- Immunohistochemistry
- Immunofluorescence
- Immunoprecipitation
- Flow Cytomety
- Cell Culture

CF150 Antibody (Center) - Images

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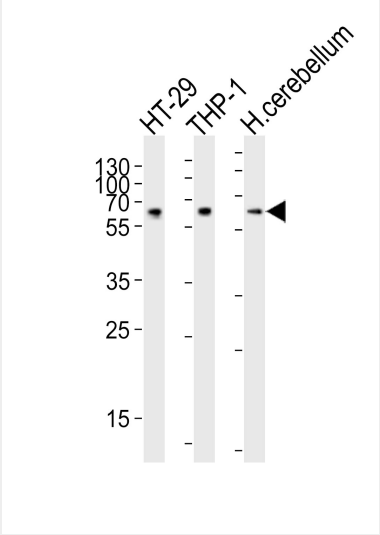
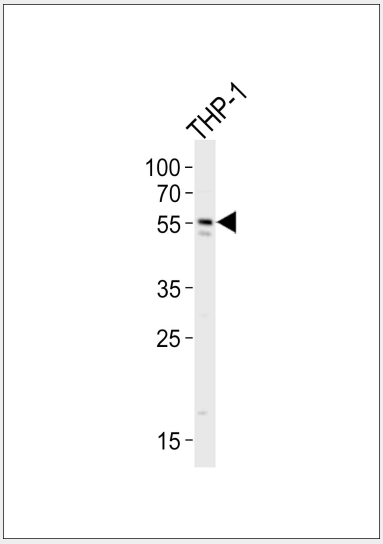


Western blot analysis of lysates from HT-29, THP-1 cell line, human cerebellum tissue lysate (from left to right), using CF150 Antibody (Center)(Cat. #AP10510c). AP10510c was diluted at 1:1000 at each lane. A goat anti-rabbit IgG H&L(HRP) at 1:10000 dilution was used as the secondary antibody. Lysates at 20ug per lane.



Western blot analysis of lysate from THP-1 cell line, using CF150 Antibody (Center)(Cat. #AP10510c). AP10510c was diluted at 1:1000. A goat anti-rabbit IgG H&L(HRP) at 1:10000 dilution was used as the secondary antibody. Lysate at 20ug.

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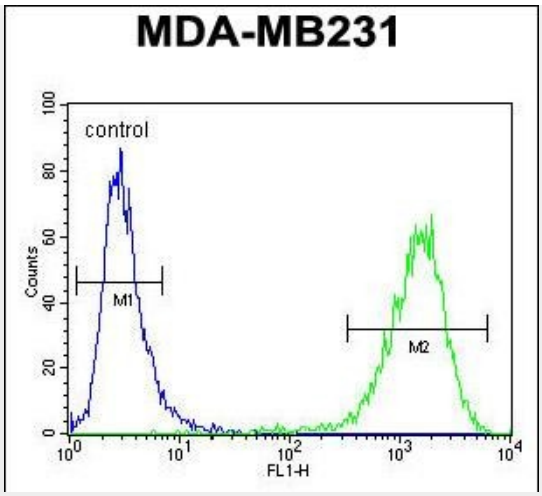
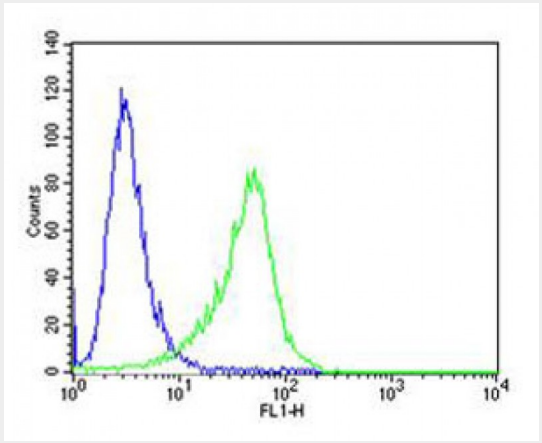


CF150 Antibody (Center) (Cat. #AP10510c) flow cytometric analysis of MDA-MB231 cells (right histogram) compared to a negative control cell (left histogram).FITC-conjugated goat-anti-rabbit secondary antibodies were used for the analysis.



Flow cytometric analysis of A549 cells using CF150 Antibody (Center) (green, Cat#AP10510c) compared to an isotype control of rabbit IgG(blue). AP10510c was diluted at 1:25 dilution. An Alexa Fluor® 488 goat anti-rabbit IgG at 1:400 dilution was used as the secondary antibody.

CF150 Antibody (Center) - Background

The exact function of C6orf150 remains unknown.

CF150 Antibody (Center) - References

Rush, J., et al. Nat. Biotechnol. 23(1):94-101(2005)
Rush, J., et al. Nat. Biotechnol. 23(1):94-101(2005)
Mungall, A.J., et al. Nature 425(6960):805-811(2003)

CF150 Antibody (Center) - Citations

- Cellular sensing of extracellular purine nucleosides triggers an innate IFN-β response
- cGAS-STING Signaling Regulates Initial Innate Control of Cytomegalovirus Infection.
- The DNA Sensor, Cyclic GMP-AMP Synthase, Is Essential for Induction of IFN-β during Chlamydia trachomatis Infection.