

CF150 Antibody (Center)
Affinity Purified Rabbit Polyclonal Antibody (Pab)
Catalog # AW5397

Specification

CF150 Antibody (Center) - Product Information

Application	WB, FC,E
Primary Accession	Q8N884
Other Accession	NP_612450.2
Reactivity	Human
Host	Rabbit
Clonality	Polyclonal
Calculated MW	H=59,50 KDa
Isotype	Rabbit IgG
Antigen Source	HUMAN

CF150 Antibody (Center) - Additional Information

Gene ID 115004

Antigen Region
266-295

Other Names

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

Dilution

WB~~1:1000

FC~~1:25

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.

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](http://www.uniprot.org/citations/21478870)), PubMed:[23258413](http://www.uniprot.org/citations/23258413)), PubMed:[23707061](http://www.uniprot.org/citations/23707061)), PubMed:[23707065](http://www.uniprot.org/citations/23707065)), PubMed:[23722159](http://www.uniprot.org/citations/23722159)), PubMed:[24077100](http://www.uniprot.org/citations/24077100)), PubMed:[24116191](http://www.uniprot.org/citations/24116191)), PubMed:[24462292](http://www.uniprot.org/citations/24462292)), PubMed:[25131990](http://www.uniprot.org/citations/25131990)), PubMed:[26300263](http://www.uniprot.org/citations/26300263)), PubMed:[29976794](http://www.uniprot.org/citations/29976794)), PubMed:[30799039](http://www.uniprot.org/citations/30799039)), PubMed:[31142647](http://www.uniprot.org/citations/31142647)), PubMed:[32814054](http://www.uniprot.org/citations/32814054)), PubMed:[33273464](http://www.uniprot.org/citations/33273464)), PubMed:[33542149](http://www.uniprot.org/citations/33542149)), PubMed:[37217469](http://www.uniprot.org/citations/37217469)), PubMed:[37802025](http://www.uniprot.org/citations/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](http://www.uniprot.org/citations/28214358)), PubMed:[28363908](http://www.uniprot.org/citations/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](http://www.uniprot.org/citations/28314590)), PubMed:[28363908](http://www.uniprot.org/citations/28363908)), PubMed:[29976794](http://www.uniprot.org/citations/29976794)), PubMed:[32817552](http://www.uniprot.org/citations/32817552)), PubMed:[33230297](http://www.uniprot.org/citations/33230297)), PubMed:[33606975](http://www.uniprot.org/citations/33606975)), PubMed:[35322803](http://www.uniprot.org/citations/35322803)), PubMed:[35438208](http://www.uniprot.org/citations/35438208)), PubMed:[35460603](http://www.uniprot.org/citations/35460603)), PubMed:[35503863](http://www.uniprot.org/citations/35503863)). Preferentially recognizes and binds curved long dsDNAs of a minimal length of 40 bp (PubMed:[30007416](http://www.uniprot.org/citations/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](http://www.uniprot.org/citations/28363908)). Has antiviral activity by sensing the presence of dsDNA from DNA viruses in the cytoplasm (PubMed:[28363908](http://www.uniprot.org/citations/28363908)). 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](http://www.uniprot.org/citations/23929945)), PubMed:[24269171](http://www.uniprot.org/citations/24269171)), PubMed:[30270045](http://www.uniprot.org/citations/30270045)), PubMed:[32852081](http://www.uniprot.org/citations/32852081)). In contrast, HIV-1 is poorly sensed by CGAS, due to its capsid that cloaks viral DNA from CGAS detection (PubMed:[24269171](http://www.uniprot.org/citations/24269171)), PubMed:[30270045](http://www.uniprot.org/citations/30270045)), PubMed:[32852081](http://www.uniprot.org/citations/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

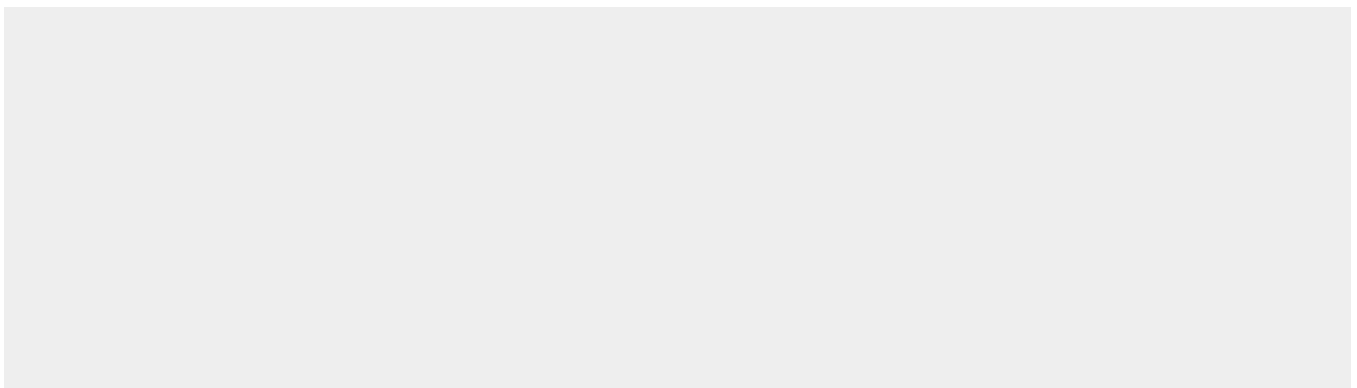
Expressed in the monocytic cell line THP1.

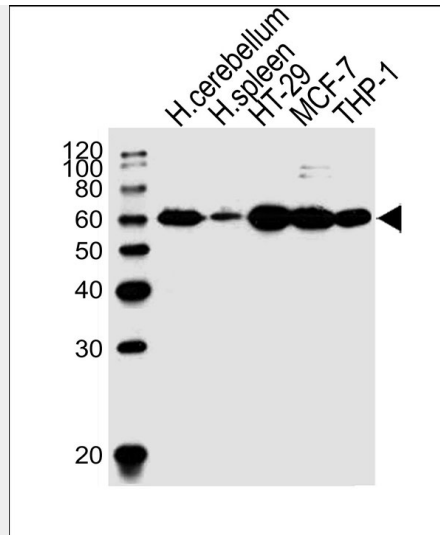
CF150 Antibody (Center) - Protocols

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

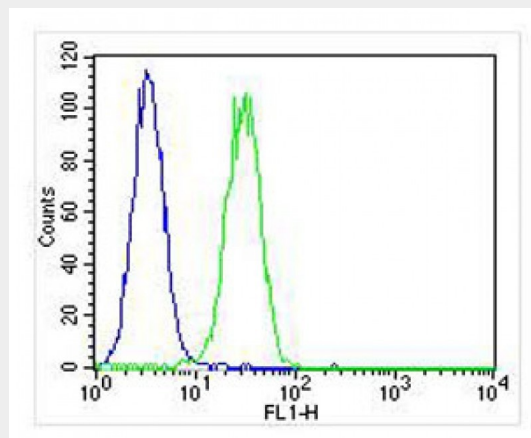
- [Western Blot](#)
- [Blocking Peptides](#)
- [Dot Blot](#)
- [Immunohistochemistry](#)
- [Immunofluorescence](#)
- [Immunoprecipitation](#)
- [Flow Cytometry](#)
- [Cell Culture](#)

CF150 Antibody (Center) - Images





All lanes : Anti-CF150 Antibody (Center) at 1:1000 dilution Lane 1: human cerebellum lysates Lane 2: human spleen lysates Lane 3: HT-29 whole cell lysates Lane 4: MCF-7 whole cell lysates Lane 5: THP-1 whole cell lysates Lysates/proteins at 20 µg per lane. Secondary Goat Anti-Rabbit IgG, (H+L), Peroxidase conjugated at 1/10000 dilution Predicted band size : 59 kDa Blocking/Dilution buffer: 5% NFD/MTBST.



Overlay histogram showing U-2OS cells stained with AW5397 (green line). The cells were fixed with 2% paraformaldehyde (10 min) and then permeabilized with 90% methanol for 10 min. The cells were then incubated in 2% bovine serum albumin to block non-specific protein-protein interactions followed by the antibody (AW5397, 1:25 dilution) for 60 min at 37°C. The secondary antibody used was Goat-Anti-Rabbit IgG, DyLight® 488 Conjugated Highly Cross-Adsorbed (NA168821) at 1/400 dilution for 40 min at 37°C. Isotype control antibody (blue line) was rabbit IgG (1µg/1x10⁶ cells) used under the same conditions. Acquisition of >10, 000 events was performed.

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)