

granzyme A (CB9): sc-56115

BACKGROUND

Granzyme A and granzyme B are serine proteases that mediate apoptotic signaling in cytotoxic T lymphocytes (CTL) and natural killer (NK) cells. Both granzyme A and granzyme B are synthesized as inactive proenzymes, and they are stored within cytolytic granules and released by effector cells during degranulation. In activated CTLs, granzyme A and granzyme B are processed and activated by cathepsin C, and they then function to induce apoptosis by two distinct pathways. Granzyme B proteolytically cleaves and activates members of the caspase family of cysteine proteases, including caspase-3, caspase-6, caspase-7 and caspase-9. When cleaved, these caspases assemble into active holoenzymes that then mediate apoptosis through a defined proteolytic cascade involving nuclear lamins and PARP (poly ADP ribose polymerase). Granzyme A mediates the activation of apoptosis by inducing single-strand DNA breaks, membrane perturbation and nuclear condensations in an alternative pathway that is independent from caspase activation or the caspase proteolytic cascade.

REFERENCES

1. Gershenfeld, H.K., et al. 1988. Cloning and chromosomal assignment of a human cDNA encoding a T cell- and natural killer cell-specific trypsin-like serine protease. *Proc. Natl. Acad. Sci. USA* 85: 1184-1188.
2. Shresta, S., et al. 1995. Natural killer and lymphokine-activated killer cells require granzyme B for the rapid induction of apoptosis in susceptible target cells. *Proc. Natl. Acad. Sci. USA* 92: 5679-5683.
3. Trapani, J.A., et al. 1996. A putative role in the mechanism of cytotoxic lymphocyte-mediated apoptosis. Localization of granzyme B in the nucleus. *J. Biol. Chem.* 271: 4127-4133.
4. Atkinson, E.A., et al. 1998. Cytotoxic T lymphocyte-assisted suicide. caspase-3 activation is primarily the result of the direct action of granzyme B. *J. Biol. Chem.* 273: 21261-21266.
5. Trapani, J.A., et al. 1998. Efficient nuclear targeting of granzyme B and the nuclear consequences of apoptosis induced by granzyme B and perforin are caspase-dependent, but cell death is caspase-independent. *J. Biol. Chem.* 273: 27934-27938.
6. Pham, C.T., et al. 1999. Dipeptidyl peptidase I is required for the processing and activation of granzymes A and B *in vivo*. *Proc. Natl. Acad. Sci. USA* 96: 8627-8632.
7. Shresta, S., et al. 1999. granzyme A initiates an alternative pathway for granule-mediated apoptosis. *Immunity* 10: 595-605.

CHROMOSOMAL LOCATION

Genetic locus: GZMA (human) mapping to 5q11.2.

SOURCE

granzyme A (CB9) is a mouse monoclonal antibody raised against purified full length native granzyme A of human origin.

RESEARCH USE

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

PRODUCT

Each vial contains 200 µg IgG₁ kappa light chain in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

granzyme A (CB9) is available conjugated to either phycoerythrin (sc-56115 PE) or fluorescein (sc-56115 FITC), 200 µg/ml, for WB (RGB), IF, IHC(P) and FCM.

APPLICATIONS

granzyme A (CB9) is recommended for detection of granzyme A of human origin by 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), flow cytometry (1 µg per 1 x 10⁶ cells) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

Suitable for use as control antibody for granzyme A siRNA (h): sc-37431, granzyme A shRNA Plasmid (h): sc-37431-SH and granzyme A shRNA (h) Lentiviral Particles: sc-37431-V.

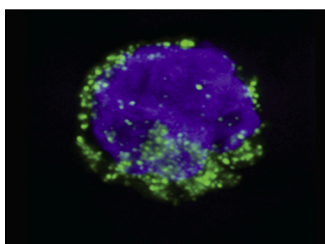
Molecular Weight of granzyme A monomer: 28 kDa.

Molecular Weight of granzyme A homodimer: 43-65 kDa.

RECOMMENDED SUPPORT REAGENTS

To ensure optimal results, the following support reagents are recommended: 1) Immunoprecipitation: use Protein A/G PLUS-Agarose: sc-2003 (0.5 ml agarose/2.0 ml). 2) Immunofluorescence: use m-IgGκ BP-FITC: sc-516140 or m-IgGκ BP-PE:sc-516141 (dilution range: 1:50-1:200) with UltraCruz[®] Mounting Medium:sc-24941 or UltraCruz[®] Hard-set Mounting Medium: sc-359850.

DATA



granzyme A (CB9): sc-56115. Immunofluorescence staining of human Cytotoxic T-Lymphocyte cells showing cytoplasmic granule (green color) localization. Kindly provided by Jerome Thiery and Judy Lieberman.

SELECT PRODUCT CITATIONS

1. Shi, Z., et al. 2022. Microglia drive transient insult-induced brain injury by chemotactic recruitment of CD8⁺ T lymphocytes. *Neuron*. E-published.

STORAGE

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