

# granzyme B (GB7): sc-56119

## 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

- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- Shresta, S., et al. 1999. Granzyme A initiates an alternative pathway for granule-mediated apoptosis. *Immunity* 10: 595-605.

## CHROMOSOMAL LOCATION

Genetic locus: GZMB (human) mapping to 14q12.

## SOURCE

granzyme B (GB7) is a mouse monoclonal antibody raised against full length granzyme B of human origin.

## RESEARCH USE

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

## PRODUCT

Each vial contains 100 µg IgG<sub>2a</sub> in 1.0 ml of PBS with 0.2% sodium azide and 0.1% stabilizer protein.

## APPLICATIONS

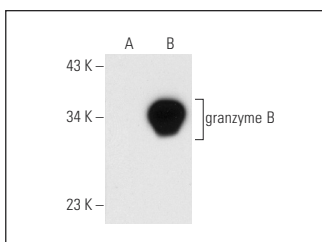
granzyme B (GB7) is recommended for detection of granzyme B of human origin by Western Blotting (starting dilution to be determined by researcher, dilution range 1:10-1:200), immunoprecipitation [1-2 µg per 100-500 µg of total protein (1 ml of cell lysate)], immunofluorescence (starting dilution to be determined by researcher, dilution range 1:10-1:200) and immunohistochemistry (including paraffin-embedded sections) (starting dilution to be determined by researcher, dilution range 1:10-1:200).

Suitable for use as control antibody for granzyme B siRNA (h): sc-35507, granzyme B shRNA Plasmid (h): sc-35507-SH and granzyme B shRNA (h) Lentiviral Particles: sc-35507-V.

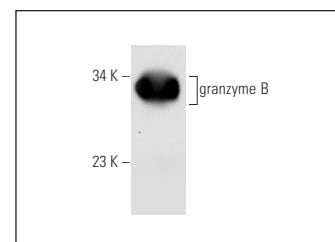
Molecular Weight of granzyme B: 32 kDa.

Positive Controls: granzyme B (h): 293T Lysate: sc-114114, NK-92 whole cell lysate: sc-364788 or HL-60 whole cell lysate: sc-2209.

## DATA



granzyme B (GB7): sc-56119. Western blot analysis of granzyme B expression in non-transfected: sc-117752 (A) and human granzyme B transfected: sc-114114 (B) 293T whole cell lysates.



granzyme B (GB7): sc-56119. Western blot analysis of granzyme B expression in NK-92 whole cell lysate.

## SELECT PRODUCT CITATIONS

- Gil-Krzewska, A., et al. 2017. An Actin cytoskeletal barrier inhibits lytic granule release from natural killer cells in patients with Chediak-Higashi syndrome. *J. Allergy Clin. Immunol.* 142: 914-927.e6.
- Feng, B., et al. 2023. PDE4D/cAMP/IL-23 axis determines the immunotherapy efficacy of lung adenocarcinoma via activating the IL-9 autocrine loop of cytotoxic T lymphocytes. *Cancer Lett.* 565: 216224.

## STORAGE

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



See **granzyme B (2C5): sc-8022** for granzyme B antibody conjugates, including AC, HRP, FITC, PE, and Alexa Fluor® 488, 546, 594, 647, 680 and 790.