

Recombinant Human Granzyme A (carrier-free)

Catalog# / Size	550802 / 10 µg 550804 / 25 µg
Regulatory Status	RUO
Other Names	Hanukah factor serine protease (HFSP), Cytolytic T cell-and natural killer cell-specific trypsin-like serine protease, Cytotoxic T-lymphocyte-associated serine esterase 3 (CTLA3)
Description	<p>Granzyme A is a serine protease belonging to the granzyme family and is expressed exclusively by cytotoxic T cells (CTL) and NK cells. Most circulating CD56⁺CD8⁻ NK cells, and approximately half of circulating CD8⁺ T cells, coexpress both granzymes A and B. In contrast, few circulating CD4⁺ T cells express granzyme A or B. Activation of CD8⁺ and CD4⁺ T lymphocytes induces substantial expression of granzyme B, but not granzyme A. Following receptor-mediated conjugate formation between a granzyme-containing cell and an infected or transformed target cell, granzymes enter the target cell via endocytosis and induce apoptosis. Granzyme A was found to induce caspase independent cell death when it enters into the target cell by perforin. Once in a cell, granzyme A activates DNA nicking by DNase NM23-H1, a tumor suppressor gene product whose expression is reduced in transformed, metastatic cells. Dysregulation of this pathway results in several human diseases, such as hemophagocytic lymphohistiocytosis. Besides the protease activity, granzyme A induces human lung fibroblasts to produce IL-6 and IL-8. Cytokine induction is abrogated by treating the serine protease with the suicide serine protease inhibitor 3,4-dichloroisocoumarin. Other fibroblast lines, as well as epithelial cells, produce cytokines in response to granzyme A. These findings suggest that granzyme A can function as an activation molecule with potentially important immunoregulatory functions. However, CTLs from mice lacking granzyme A induce morphologically normal apoptosis <i>in vitro</i>, but those from mice that are deficient of granzyme B induce the nuclear features of apoptosis (particularly DNA fragmentation) more slowly than do wild-type CTLs.</p>

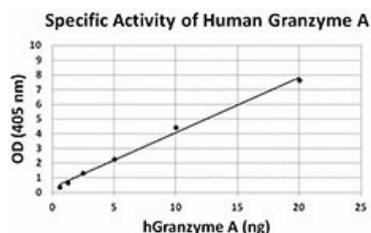
Product Details

Source	Human Granzyme A, amino acids (Cys26-Val262) (Accession# NP_006135.1), is expressed with a C-terminal 10 His tag and a linker sequence in the 293E cell line.
Molecular Mass	This 252 amino acid recombinant protein has a predicted molecular mass of approximately 28 kD. The protein migrates at about 35 kD in DTT-reducing conditions and about 55 kD in non-reducing conditions by SDS-PAGE. The predicted N-terminal amino acid is Cys.
Purity	>90%, as determined by Coomassie stained SDS-PAGE.
Formulation	0.22 µm filtered protein solution is in 20 mM Tris, 150 mM NaCl, pH 7.5.
Endotoxin Level	Less than 1.0 EU per µg of protein as determine by the LAL method.
Concentration	10 and 25 µg sizes are bottled at 200 µg/mL.
Storage & Handling	Unopened vial can be stored at -70°C for six months. For maximum results, quick spin vial prior to opening. Avoid repeated freeze/thaw cycles.
Activity	Lysyl endopeptidase activated human granzyme A cleaves the peptide substrate N-carbobenzyloxy-Gly-Arg-ThioBenzyl ester (Z-GR-SBzl), in the presence of 5,5'-Dithio-bis (2-nitrobenzoic acid) (DTNB), with an activity >5,000 pmol/min/µg.
Application	Bioassay
Application Notes	<p>This protein is in the latent form and needs to be activated for bioassay.</p> <p>BioLegend carrier-free recombinant proteins provided in liquid format are shipped on blue-ice. Our comparison testing data indicates that when handled and stored as recommended, the liquid format has equal or better stability and shelf-life compared to commercially available lyophilized proteins after reconstitution. Our liquid proteins are verified in-house to maintain activity after shipping on blue ice and are backed by our 100% satisfaction guarantee. If you have any concerns, contact us at tech@biolegend.com.</p>

Antigen Details

Structure	Monomer
Distribution	CTL and NK cells.
Function	Granzyme A is able to induce target cell apoptosis by activating caspase independent pathways.
Interaction	Targets of CTL and NK cells.
Bioactivity	Lysyl endopeptidase activated human granzyme A is able to cleave a colorimetric peptide substrate, N-carbobenzyloxy-Gly-Arg-ThioBenzyl ester (Z-GR-SBzl), in the presence of 5,5'Dithio-bis (2-nitrobenzoic acid) (DTNB).
Biology Area	Cell Biology, Immunology, Innate Immunity, Neuroscience
Molecular Family	Proteases, Enzymes and Regulators
Antigen References	<ol style="list-style-type: none">1. Edwards KM, <i>et al.</i> 1999. <i>J. Biol. Chem.</i> 274:30468.2. Lieberman J, and Fan Z. 2003. <i>Curr. Opin. Immunol.</i> 15:553.3. Fan Z, <i>et al.</i> 2003. <i>Cell.</i> 112:659.4. Sower LE, <i>et al.</i> 1996. <i>Cell Immunol.</i> 171:159.5. Grossman WJ. <i>et al.</i> 2004. <i>Blood.</i> 104:2840.6. Ebnet K, <i>et al.</i> 1995. <i>EMBO J.</i> 14:4230.7. Heusel JW, <i>et al.</i> 1994. <i>Cell.</i> 76:977.
Gene ID	3001

Product Data



The activity of recombinant human granzyme A is determined by its ability to cleave a colorimetric peptide substrate, N-carbobenzyloxy-Gly-Arg-ThioBenzyl ester (Z-GR-SBzl), in the presence of 5,5'Dithio-bis (2-nitrobenzoic acid) (DTNB) with an activity of >5,000 pmol/min/ μ g.

For research use only. Not for diagnostic use. Not for resale. BioLegend will not be held responsible for patent infringement or other violations that may occur with the use of our products.

*These products may be covered by one or more Limited Use Label Licenses (see the BioLegend Catalog or our website, www.biolegend.com/ordering#license). BioLegend products may not be transferred to third parties, resold, modified for resale, or used to manufacture commercial products, reverse engineer functionally similar materials, or to provide a service to third parties without written approval of BioLegend. By use of these products you accept the terms and conditions of all applicable Limited Use Label Licenses. Unless otherwise indicated, these products are for research use only and are not intended for human or animal diagnostic, therapeutic or commercial use.

BioLegend Inc., 8999 BioLegend Way, San Diego, CA 92121 www.biolegend.com
Toll-Free Phone: 1-877-Bio-Legend (246-5343) Phone: (858) 768-5800 Fax: (877) 455-9587