Anti-GZMK Rabbit Polyclonal Antibody

Granzyme K, EC 3.4.21.-, Fragmentin-3, Granzyme-3, NK-tryptase-2, NK-Tryp-2,

Gene: GZMK **UniProt:** P49863 **Host:** Rabbit **Clonality:** Polyclonal (pAb)

Product Image

Image placeholder — Western Blot

— Western Blot

Suggested image: Western blot of relevant cell or tissue lysates under reducing conditions, probed with the domain-specific antibody. Include a positive-control lane and empty-vector or knockout negative control. Loading: 10–20 µg/lane on 7.5–10% SDS-PAGE.

Key Product Facts

Supplier	Triple Point Biologics, Inc. (Sudbury, Ontario, Canada)
Product Name	Anti-GZMK Rabbit Polyclonal Antibody
Gene Symbol	GZMK
Alternative Names	Granzyme K, EC 3.4.21.-, Fragmentin-3, Granzyme-3, NK-tryptase-2, NK-Tryp-2,
UniProt ID	P49863
Host Species	Rabbit
Clonality	Polyclonal (pAb)
Isotype	IgG
Concentration	1mg/ml
Purity	Affinity purified
Pack Size	100ug
Validated Application	WB
Recommended Dilution	WB-1/1000
Species Reactivity	Validated- Human Potential-
Immunogen Type	Synthetic Peptide from Uniprot Sequence
Conjugation	none
Buffer / Preservatives	Sodium Chloride 500 mM, Sodium Phosphate 10 mM, Potassium Phosphate 1.8 mM, Potassium Chloride 2.7 mM, Glycerol 50% (v/v)
Website	triplepointbiologics.com/anti-granzyme-k-rabbit-polyclonal-antibody

Available Domain-Specific Variants

Triple Point Biologics produces antibodies to defined structural domains of GZMK. Each variant is directed at a specific structural region of the protein. Exact peptide sequences are proprietary; each variant is validated for the applications listed.

Domain / Variant	Epitope Region (approx. residues)	Cat. No.	Availability

Amino end mature Granzyme-K	**27–77** Region spanning the newly exposed N-terminus of mature GZMK immediately following signal peptide and propeptide cleavage, corresponding to the Ile-Ile N-terminal activation motif and the first beta-strand of the mature serine protease domain; this region is critical for salt-bridge formation with Asp194 and catalytic activation	RP1Granzyme K	In catalog
Catalytic domain, after the catalytic Aspartic acid residue.	**27–259** Region within the catalytic domain of GZMK situated C-terminal to the conserved catalytic Asp residue (part of the His-Asp-Ser triad), encompassing surface-exposed loops and beta-strands of the chymotrypsin-like fold that contribute to substrate binding and positioning downstream of the Asp catalytic residue	RP2Granzyme K	In catalog
Catalytic domain, before the catalytic serine residue.	**27–259** Region within the catalytic domain of GZMK immediately N-terminal to the conserved catalytic Ser residue of the His-Asp-Ser triad, encompassing the activation-domain salt-bridge partner Asp194 and adjacent structural elements of the substrate-binding cleft that precede the nucleophilic serine	RP3Granzyme K	In catalog
—	**27–264** Broad epitope coverage spanning the full mature GZMK protein, including the N-terminal activation region, the complete catalytic domain with His-Asp-Ser triad, the substrate-binding loops, and the C-terminal region of the chymotrypsin-like fold; suitable for general detection across multiple structural regions of GZMK	RP-GranzymeK	In catalog

Applications & Recommended Dilutions

App.	Species	Dilution Range	Notes
WB	Validated-Human Potential-	1:1000	Optimal dilution should be determined per laboratory and lot.

Optimal dilutions should be determined by each laboratory for each application. Triple Point Biologics antibodies include a peptide-neutralized negative control aliquot for specific-signal confirmation.

Storage & Handling

Short-term Storage	+4°C (1–2 weeks)

Long-term Storage	Aliquot and store at -20°C
Shipping Conditions	Shipped in styrofoam cooler on blue ice
Hazard Warning	Product may contain Sodium Azide — POISONOUS AND HAZARDOUS. Handle by trained personnel only.
Shelf Life	12 months from date of receipt under recommended conditions

Target Background

Family & General Biology

Granzyme K (GZMK) is a member of the granzyme family of serine proteases, which are stored in the cytotoxic granules of CD8+ cytotoxic T lymphocytes (CTLs) and natural killer (NK) cells. Granzymes share structural homology with the chymotrypsin-like serine protease superfamily and are characterised by the conserved His-Asp-Ser catalytic triad. Among the five human granzymes (A, B, H, K, and M), GZMK displays trypsin-like substrate specificity, cleaving after basic (Arg/Lys) residues. It is also known as Granzyme-3, Fragmentin-3, and NK-tryptase-2, reflecting its historical characterisation in NK cell biology.

Expression & Localisation

GZMK is expressed predominantly in CD8+ cytotoxic T lymphocytes and NK cells, with lower-level expression reported in certain CD4+ T-cell subsets, particularly under inflammatory conditions. Within the cell, GZMK is packaged into secretory lysosomes (cytotoxic granules) as an inactive zymogen. Upon target cell recognition and immune synapse formation, the granule contents are directionally secreted into the synaptic cleft. Circulating GZMK can also be detected in plasma during active immune responses, positioning it as a potential biomarker of CTL and NK cell activity in peripheral blood.

Activation Mechanism

GZMK is synthesised with a signal peptide and a two-residue propeptide (Glu-Glu) that maintains the zymogen in an inactive conformation within the endoplasmic reticulum and Golgi. Processing to the catalytically active mature form occurs in acidified cytotoxic granules via dipeptidyl peptidase I (DPPI/cathepsin C), which removes the propeptide to expose the mature N-terminus (Ile-Ile). This N-terminal isoleucine engages the internal Asp194 to form the salt bridge required for correct alignment of the catalytic triad and full proteolytic activity. The mature 26 kDa form is secreted during cytotoxic responses.

Key Substrates & Complement Activation

GZMK exhibits a functionally diverse substrate repertoire. It cleaves complement components C2 and C4, thereby initiating complement activation independently of antibody, placing it as the first identified T-cell-derived serine protease capable of directly engaging the complement cascade. GZMK also cleaves and activates protease-activated receptors PAR1 (F2R) and PAR2 (F2RL1), potentially driving pro-inflammatory cytokine and interleukin release from endothelial and epithelial cells. Additionally, GZMK can proteolytically activate the pro-apoptotic BH3-only protein BID, leading to mitochondrial outer membrane permeabilisation and cytochrome c release, linking GZMK to caspase-independent apoptotic signalling.

Interaction with Heparan Sulfate & Opsonisation

GZMK binds heparan sulfate proteoglycans (HSPGs) on cell and pathogen surfaces with high affinity. This interaction is thought to act as a pattern-recognition mechanism, concentrating GZMK at sites of microbial infection and facilitating opsonisation. By recognising heparan sulfate glycosaminoglycans on pathogen surfaces and subsequently cleaving C2 and C4, GZMK links innate-like pattern recognition to complement-mediated effector functions. This positions GZMK at an intersection of adaptive CTL immunity and innate complement biology, a function not shared by the more extensively studied granzymes A and B.

Disease Relevance

Elevated GZMK expression and plasma levels have been associated with a range of inflammatory and infectious disease states, including sepsis, COVID-19, and autoimmune conditions, where dysregulated CTL and NK cell activity contributes to pathology. In tumour immunology, GZMK-expressing CD8+ T cells have been identified within exhausted and transitional T-cell populations in the tumour microenvironment, raising interest in GZMK as both a functional marker and potential therapeutic target. Its ability to activate PAR receptors on stromal and epithelial cells may also contribute to tissue remodelling and inflammatory amplification in chronic disease settings.

Gene & Protein Reference

Gene Symbol	GZMK
HGNC	4709
NCBI Gene ID (Human)	2960
NCBI Gene ID (Mouse)	14938
Ensembl	ENSG00000113088
OMIM	600311
UniProt (Human)	P49863
UniProt (Mouse)	P11032
Protein Family	Peptidase S1 (chymotrypsin) family; Granzyme subfamily
Predicted MW	~28.8 kDa (precursor); ~26.5 kDa (mature, signal peptide and propeptide removed)
Observed MW	~26–30 kDa (SDS-PAGE, depending on glycosylation state)
Chromosome	5q11.2
Paralogue	GZMA (Granzyme A), GZMB (Granzyme B), GZMH (Granzyme H), GZMM (Granzyme M)
Key Substrates	Complement components C2 and C4; PAR1 (F2R); PAR2 (F2RL1); BID; heparan sulfate proteoglycan-associated substrates
Activated by	Dipeptidyl peptidase I (DPPI / Cathepsin C) — removes Glu-Glu propeptide in cytotoxic granules to yield active mature form
Inhibited by	Serpins (including antithrombin III / SERPINC1, protease nexin-1 / SERPINE2); general serine protease inhibitors (PMSF, DFP)

About Triple Point Biologics

With over 30 years dedicated to antibody production, Triple Point Biologics is a Canadian company and the premier resource for proteinase and proteinase inhibitor research. Products have been cited in thousands of peer-reviewed publications.

The domain-specific antibody strategy — available in standard, ATK, SPA, and GSK kit formats — delivers predefined epitopes, built-in peptide-neutralized negative controls, and superior specificity for Western blot.

Website: www.triplepointbiologics.com

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Product specifications subject to change. Contact Triple Point Biologics for current product and availability information.