Anti-TLL1 Rabbit Polyclonal Antibody

Tolloid-like protein 1

Gene: TLL1 **UniProt:** O43897 **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-TLL1 Rabbit Polyclonal Antibody
Gene Symbol	TLL1
Alternative Names	Tolloid-like protein 1
UniProt ID	O43897
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-tll-1-rabbit-polyclonal-antibody

Available Domain-Specific Variants

Triple Point Biologics produces antibodies to defined structural domains of TLL1. 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

propeptide domainÂ	**31–147** Region within the N-terminal propeptide of human TLL-1, upstream of the astacin-like catalytic domain; this segment maintains zymogen latency and is removed by furin-family convertases during activation, making it accessible as an antigen in the unprocessed precursor form	RP1TLL1	In catalog
third CUB domainÂ	**618–730** Region spanning the third CUB (complement C1r/C1s, Uegf, BMP-1) domain of human TLL-1, located in the C-terminal non-catalytic module array downstream of the EGF-like domain repeats; CUB domains in tolloid-family proteases mediate substrate recognition and interactions with regulatory proteins such as PCOLCEs	RP2TLL1	In catalog
—	**148–1013** Broad multi-domain recombinant fragment encompassing regions from the propeptide through the C-terminal CUB domains of human TLL-1, providing epitope coverage across the full-length precursor and suitable for detection of multiple processed and unprocessed forms of the protein	RP-TLL1	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

TLL-1 (Tolloid-like protein 1, UniProt O43897) is a secreted zinc-dependent metalloprotease belonging to the astacin family, tolloid subfamily. It shares structural and functional homology with Drosophila Tolloid (TLD) and its vertebrate paralogues BMP-1 (also known as procollagen C-proteinase) and mammalian Tolloid (mTLD/BMP-1 long form). Like other tolloid-subfamily members, TLL-1 carries an N-terminal prodomain, a catalytic astacin-like metalloprotease domain, and a C-terminal array of CUB and EGF-like domains that mediate substrate recognition and protein–protein interactions.

Expression & Localisation

TLL-1 is expressed predominantly in developing cardiovascular and musculoskeletal tissues, with highest transcript levels detected in the heart, skeletal muscle, and bone during embryogenesis. In the adult, expression is more restricted but persists in cardiac and connective tissues. The protein is secreted into the extracellular space, where it acts on extracellular matrix components and morphogenic regulators. Subcellular fractionation and immunolocalisation studies consistently detect TLL-1 in the pericellular matrix and associated with the cell surface of matrix-producing cells.

Activation Mechanism

TLL-1 is synthesised as a zymogen bearing an N-terminal prodomain that maintains latency by occluding the catalytic cleft. Activation occurs through proteolytic removal of the propeptide, a step facilitated by furin-family proprotein convertases in the trans-Golgi network or at the cell surface. The mature, two-chain form retains the catalytic domain in association with the CUB/EGF module array. This domain arrangement is conserved across the tolloid subfamily and is required for full catalytic activity and correct substrate engagement in the extracellular environment.

Key Substrates & Pathway Roles

The best-characterised substrate of TLL-1 is chordin, the BMP antagonist. Cleavage of chordin by TLL-1 releases active bone morphogenetic proteins (particularly BMP-2 and BMP-4) and thereby sharpens the BMP signalling gradient required for dorsoventral patterning and skeletogenesis. Additional substrates include pro-biglycan, pro-lysyl oxidase (regulating collagen cross-linking), and fibronectin. TLL-1 has also been reported to cleave SLIT2, an axon guidance cue; this cleavage event modulates sensory axon fasciculation, implicating TLL-1 in neural circuit formation beyond its established matrix-remodelling and morphogenic roles.

Disease Relevance

Loss-of-function studies in mice demonstrate that Tll1-null embryos develop severe cardiac septation defects, establishing TLL-1 as a non-redundant regulator of heart morphogenesis. Genome-wide and candidate-gene association studies have linked TLL1 variants to congenital heart disease in human cohorts. Beyond development, TLL-1 has been implicated in tumour biology; knockdown studies in prostate cancer models indicate that reduced TLL-1 activity alters the tumour immune microenvironment and influences disease progression. These findings position TLL-1 as both a developmental protease and a candidate modifier in adult pathology.

Inhibitor Profile

Like other astacin-family proteases, TLL-1 is inhibited by the metalloprotease inhibitor 1,10-phenanthroline and by general hydroxamate-based MMP inhibitors at high concentrations, but it is notably resistant to the classical endogenous MMP inhibitors TIMP-1 and TIMP-2 under physiological conditions. Specific endogenous regulation involves procollagen C-proteinase enhancer proteins (PCOLCEs), which modulate BMP-1/tolloid protease activity on fibrillar collagen substrates. The prodomain itself acts as an intramolecular inhibitor prior to furin-mediated activation, a mechanism shared across the tolloid subfamily.

Gene & Protein Reference

Gene Symbol	TLL1
HGNC	11805
NCBI Gene ID (Human)	7093
NCBI Gene ID (Mouse)	21351
Ensembl	ENSG00000197128
OMIM	606742
UniProt (Human)	O43897
UniProt (Mouse)	O35451
Protein Family	Astacin family, Peptidase M12A subfamily, Tolloid subfamily
Predicted MW	~114 kDa (1,013 aa precursor)
Observed MW	~100–114 kDa (variable with glycosylation; mature processed forms may appear lower)
Chromosome	4q32.3
Paralogue	BMP1 (BMP-1/mTLD), TLL2
Key Substrates	Chordin, pro-biglycan, pro-lysyl oxidase, SLIT2, fibronectin
Activated by	Furin-family proprotein convertases (prodomain removal)
Inhibited by	1,10-phenanthroline; PCÖLCE proteins (modulate activity on collagen substrates); prodomain (intramolecular)

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.