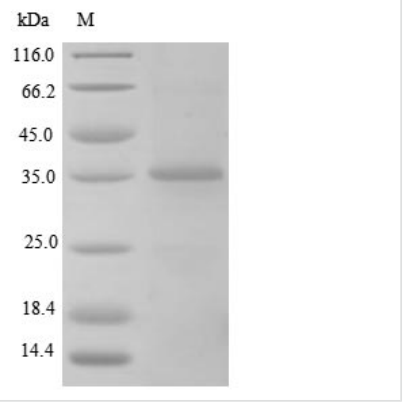
Recombinant Rat Transforming growth factor beta-1 proprotein (Tgfb1), partial

Product Code	CSB-EP023446RAa0
Relevance	Multifunctional protein that controls proliferation, differentiation and other functions in many cell types. Many cells synthesize TGFB1 and have specific receptors for it. It positively and negatively regulates many other growth factors. It plays an important role in bone remodeling as it is a potent stimulator of osteoblastic bone formation, causing chemotaxis, proliferation and differentiation in committed osteoblasts. Stimulates sustained production of collagen through the activation of CREB3L1 by regulated intramembrane proteolysis (RIP). Can promote either T-helper 17 cells (Th17) or regulatory T-cells (Treg) lineage differentiation in a concentration-dependent manner. At high concentrations, leads to FOXP3-mediated suppression of RORC and down-regulation of IL-17 expression, favoring Treg cell development. At low concentrations in concert with IL-6 and IL-21, leads to expression of the IL-17 and IL-23 receptors, favoring differentiation to Th17 cells. Mediates SMAD2/3 activation by inducing its phosphorylation and subsequent translocation to the nucleus. Can induce epithelial-to-mesenchymal transition (EMT) and cell migration in various cell types
Abbreviation	Recombinant Rat Tgfb1 protein, partial
Storage	The shelf life is related to many factors, storage state, buffer ingredients, storage temperature and the stability of the protein itself. Generally, the shelf life of liquid form is 6 months at -20°C/-80°C. The shelf life of lyophilized form is 12 months at -20°C/-80°C.
Uniprot No.	P17246
Product Type	Recombinant Protein
Immunogen Species	Rattus norvegicus (Rat)
Purity	Greater than 85% as determined by SDS-PAGE.
Sequence	LSTCKTIDMELVKRKRIEAIRGQILSKLRLASPPSQGEVPPGPLPEAVLALYNST RDRVAGESADPEPEPEADYYAKEVTRVLMVDRNNAIYDKTKDITHSIYMFFNT SDIREAVPEPPLLSRAELRLQRFKSTVEQHVELYQKYSNNSWRYLGNRLLTPT DTPEWLSFDVTGVVRQWLNQGDGIQGFRFSAHCSCDSKDNVLHVEINGISPK RRGDLGTIHDMNRPFLLLMATPLERAQHLHSSRHRR
Research Area	Signal Transduction
Source	E.coli
Target Names	Tgfb1
Expression Region	30-278aa
Notes	Repeated freezing and thawing is not recommended. Store working aliquots at 4°C for up to one week.

Tag Info	N-terminal 6xHis-tagged
Mol. Weight	34.0 kDa
Protein Length	Partial

Image



(Tris-Glycine gel) Discontinuous SDS-PAGE (reduced) with 5% enrichment gel and 15% separation gel.

Description

Recombinant Rat Transforming growth factor beta-1 proprotein (Tgfb1) is expressed in E. coli with an N-terminal 6xHis-tag for easy purification. The protein includes the amino acids 30-278, representing a partial sequence of the full-length protein. This product achieves a purity greater than 85% as verified by SDS-PAGE, making it suitable for various laboratory applications. It is offered for research use only and not for diagnostic or therapeutic purposes.

Transforming growth factor beta-1 (TGF-beta1) appears to be one of the more crucial cytokines involved in regulating cell growth, differentiation, and immune responses. Part of the broader TGF-beta superfamily, it likely plays significant roles in cellular processes and participates in numerous signaling pathways. Scientists have extensively studied TGF-beta1 for its impact on fibrosis, wound healing, and immune system modulation, which may explain why it has become a key focus across various research areas.

Potential Applications

Note: The applications listed below are based on what we know about this protein's biological functions, published research, and experience from experts in the field. However, we haven't fully tested all of these applications ourselves yet. We'd recommend running some preliminary tests first to make sure they work for your specific research goals.

1. Antibody Development and Validation Studies

This recombinant rat TGF-β1 proprotein can serve as an immunogen or antigen for developing antibodies specific to the rat TGF-β1 proprotein form. The N-terminal 6xHis tag makes purification and immobilization relatively straightforward for antibody screening assays. Researchers might find this protein useful in ELISA-based antibody characterization studies to determine binding specificity and affinity. The 85% purity level appears sufficient for most antibody development applications where complete homogeneity isn't

necessarily critical.

2. Protein-Protein Interaction Studies

Pull-down assays become more manageable with the 6xHis tag, potentially helping identify binding partners of the TGF-β1 proprotein in rat cell lysates or tissue extracts. This approach could shed light on the molecular mechanisms involved in TGF-β1 proprotein processing and regulation. Scientists can immobilize the recombinant protein on nickel-affinity resins and use it to capture interacting proteins for subsequent mass spectrometry analysis. Such studies may reveal novel regulatory proteins involved in TGF-β1 signaling pathways, though results will likely require validation through additional methods.

3. Biochemical Characterization and Stability Studies

Investigating the biochemical properties of the TGF-β1 proprotein becomes possible with this recombinant version. This includes examining its stability under various pH and temperature conditions. Proteolytic cleavage studies might help researchers understand how the proprotein gets processed to release mature TGF-β1. The protein's behavior in different buffer systems and storage conditions can be systematically evaluated, though optimal conditions may vary between laboratory settings. These studies could provide fundamental insights into the proprotein's structural requirements for proper folding and processing.

4. Comparative Species Analysis

The rat-specific sequence makes this recombinant protein particularly valuable for comparative studies examining species differences in TGF-β1 proprotein structure and processing. Comparing the biochemical properties of this rat proprotein with human or mouse orthologs might reveal species-specific features that weren't previously obvious. Cross-reactivity studies with antibodies developed against human TGF-β1 could highlight both conserved and divergent epitopes. Such comparative analyses may contribute to understanding evolutionary relationships and species-specific regulatory mechanisms, though interpreting these differences in biological context remains challenging.

Reconstitution	We recommend that this vial be briefly centrifuged prior to opening to bring the contents to the bottom. Please reconstitute protein in deionized sterile water to a concentration of 0.1-1.0 mg/mL.We recommend to add 5-50% of glycerol (final concentration) and aliquot for long-term storage at -20°C/-80°C. Our default final concentration of glycerol is 50%. Customers could use it as reference.
Shelf Life	The shelf life is related to many factors, storage state, buffer ingredients, storage temperature and the stability of the protein itself. Generally, the shelf life of liquid form is 6 months at -20°C/-80°C. The shelf life of lyophilized form is 12 months at -20°C/-80°C.