



## Genorise® Recombinant Bovine TGFβ1

Catalog Number: GR104064

### Background

TGFβ1 (transforming growth factor beta 1) is one of three closely related mammalian members of the large TGFβ superfamily that share a characteristic cystine knot structure (1 7). TGFβ1, 2 and 3 are highly pleiotropic cytokines that are proposed to act as cellular switches that regulate processes such as immune function, proliferation and epithelial mesenchymal transition (1 4). Each TGFβ isoform has some nonredundant functions; for TGFβ1, mice with targeted deletion show defects in hematopoiesis and endothelial differentiation and die of overwhelming inflammation (2). Human TGFβ1 cDNA encodes a 390 amino acid (aa) precursor that contains a 29 aa signal peptide and a 361 aa proprotein (8). A furin-like convertase processes the proprotein to generate an N-terminal 249 aa latency associated peptide (LAP) and a C terminal 112 aa mature TGFβ1 (8, 9). Disulfide-linked homodimers of LAP and TGFβ1 remain noncovalently associated after secretion, forming the small latent TGFβ1 complex (8 10). Covalent linkage of LAP to one of three latent TGFβ binding proteins (LTBPs) creates a large latent complex that may interact with the extracellular matrix (9, 10). TGFβ is activated from latency by pathways that include actions of the protease plasmin, matrix metalloproteases, thrombospondin 1 and a subset of integrins (10). Mature human TGFβ1 shares 100% aa identity with pig, dog and cow TGFβ1, and 99% aa identity with mouse, rat and horse TGFβ1.

It demonstrates cross species activity (1). TGFβ1 signaling begins with high affinity binding to a type II ser/thr kinase receptor termed TGFβ RII. This receptor then phosphorylates and activates a second ser/thr kinase receptor, TGFβ RI (also called activin receptor-like kinase (ALK) 5), or alternatively, ALK-1. This complex phosphorylates and activates Smad proteins that regulate transcription (3, 11, 12). Contributions of the accessory receptors beta-glycan (also known as TGFβ RIII) and endoglin, or use of Smad independent signaling pathways, allow for disparate actions observed in response to TGFβ in different contexts (11).

### References:

1. Derynck, R. and K. Miyazono (2008) Cold Spring Harbor Laboratory Press, 29.
2. Dunker, N. and K. Krieglstein (2000) *Eur. J. Biochem.* **267**:6982.
3. Wahl, S.M. (2006) *Immunol. Rev.* **213**:213.
4. Chang, H. *et al.* (2002) *Endocr. Rev.* **23**:787.
5. Lin, J.S. *et al.* (2006) *Reproduction* **132**:179.
6. Hinck, A.P. *et al.* (1996) *Biochemistry* **35**:8517.
7. Mittl, P.R.E. *et al.* (1996) *Protein Sci.* **5**:1261.
8. Derynck, R. *et al.* (1985) *Nature* **316**:701.
9. Miyazono, K. *et al.* (1988) *J. Biol. Chem.* **263**:6407.
10. Oklu, R. and R. Hesketh (2000) *Biochem. J.* **352**:601.
11. de Caestecker, M. *et al.* (2004) *Cytokine Growth Factor Rev.* **15**:1.
12. Zuniga, J.E. *et al.* (2005) *J. Mol. Biol.* **354**:1052.



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### Description

**Source:** Chinese Hamster Ovary cell derived

**Component:** Ala279 –Ser390

**Accession #** NP\_001159540.1

**N-terminal Sequence Analysis:** Ala279

**Predicted Molecular Mass:** 12.6 kDa (monomer)

### Specifications

**Activity** Measured by its ability to inhibit the IL-4-dependent proliferation of HT-2 mouse T cells. Tsang, M et al. (1995) 7:389. The ED50 for this effect is typically 40-200 pg/mL.

**Endotoxin Level:** <1.0 EU per 1 µg of the protein by the LAL method.

**Purity:** >97%, by SDS-PAGE under reducing conditions and visualized by silver stain.

**Formulation:** Lyophilized from a 0.2 µm filtered solution in Acetonitrile and TFA with BSA as a carrier protein.

### Preparation and Storage

**Reconstitution:** Purified recombinant bovine TGFβ1 is an extremely hydrophobic protein that adheres strongly to surfaces. To ensure recovery, reconstitute at 20 µg/mL in sterile 4 mM HCl containing 1 mg/ml of human or bovine serum albumin.

**Shipping** The product is shipped at ambient temperature. Upon receipt, store it immediately at the temperature recommended below.

**Stability & Storage:** Use a manual defrost freezer and avoid repeated freeze thaw cycles.

- 3 months -20 to -70°C as provided.
- 1 month, 2 to 8 °C under sterile conditions after reconstitution.
- 2 months, -20 to -70°C under sterile conditions after reconstitution.

### DECLARATION

THIS REAGENT IS FOR IN VITRO LABORATORY TESTING AND RESEARCH USE ONLY. DO NOT USE IT FOR CLINICAL DIAGNOSTICS. DO NOT USE OR INJECT IT IN HUMANS AND ANIMALS.

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