

DESCRIPTION

Source Chinese Hamster Ovary cell line, CHO-derived
 Ala279-Ser390
 Accession # P01137

N-terminal Sequence Analysis Ala279

Structure / Form Disulfide-linked homodimer

Predicted Molecular Mass 12.8 kDa (monomer)

SPECIFICATIONS

SDS-PAGE 12 kDa, reducing conditions

Activity Measured by its ability to inhibit the IL-4-dependent proliferation of HT-2 mouse T cells. Tsang, M. *et al.* (1995) *Cytokine* 7:389. The ED₅₀ for this effect is typically 0.04-0.2 ng/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. See Certificate of Analysis for details.

PREPARATION AND STORAGE

Reconstitution Purified recombinant human TGF-β1 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 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.**

- 12 months from date of receipt, -20 to -70 °C as supplied.
- 1 month, 2 to 8 °C under sterile conditions after reconstitution.
- 3 months, -20 to -70 °C under sterile conditions after reconstitution.

BACKGROUND

TGF-β1 (transforming growth factor beta 1) is one of three closely related mammalian members of the large TGF-β superfamily that share a characteristic cystine knot structure (1 - 7). TGF-β1, -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 TGF-β isoform has some non-redundant functions; for TGF-β1, mice with targeted deletion show defects in hematopoiesis and endothelial differentiation, and die of overwhelming inflammation (2). Human TGF-β1 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 TGF-β1 (8, 9). Disulfide-linked homodimers of LAP and TGF-β1 remain non-covalently associated after secretion, forming the small latent TGF-β1 complex (8 - 10). Covalent linkage of LAP to one of three latent TGF-β binding proteins (LTBPs) creates a large latent complex that may interact with the extracellular matrix (9, 10). TGF-β 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 TGF-β1 shares 100% aa identity with pig, dog and cow TGF-β1, and 99% aa identity with mouse, rat and horse TGF-β1. It demonstrates cross-species activity (1). TGF-β1 signaling begins with high-affinity binding to a type II ser/thr kinase receptor termed TGF-β RII. This receptor then phosphorylates and activates a second ser/thr kinase receptor, TGF-β 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 betaglycan (also known as TGF-β RIII) and endoglin, or use of Smad-independent signaling pathways, allow for disparate actions observed in response to TGF-β in different contexts (11).

References:

1. Derynck, R. and K. Miyazono (2008) Cold Spring Harbor Laboratory Press, 29.
2. Dunker, N. and K. Kriegelstein (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.