Recombinant Human TGF-beta 1 (His)

Information

Gene ID	7040
Accession #	P01137
Alternate Names	TGFB1, TGFB, TGF-beta 1, TGFbeta1, CED, DPD1, Latency-associated peptide (LAP)
Source	HEK293
Protein sequence	-
Tag	His
M.Wt	Approximately 59.5 kDa
Appearance	Solution protein.
Stability & Storage	Avoid repeated freeze-thaw cycles. It is recommended that the protein be aliquoted for optimal storage. -3 years from date of receipt, -20 to -70°C as supplied.
Concentration	1 mg/mL
Formulation	Supplied as a 0.2 μm filtered solution in PBS, pH7.4.
Reconstitution	We recommend that this vial be briefly centrifuged prior to opening to bring the contents to the bottom. This solution can be diluted into other aqueous buffers.
Biological Activity	Fully biologically active as determined by detecting the firefly luciferase activity in HEK293 cells transfected with pSBE4_TA_luc. The EC_{50} for this effect is 1.7~2 ng/mL.
Shipping Condition	Shipping with dry ice.
Handling	Centrifuge the vial prior to opening.
Usage	For Research Use Only! Not to be used in humans.

Quality Control

Purity	> 95 % by SDS-PAGE.
Endotoxin	Less than 0.1 EU/μg as determined by LAL method.

Description

TGF-beta 1 (transforming growth factor beta 1) is one of three closely related mammalian members of the large TGF-beta superfamily and has a characteristic cysteine knot structure (1–7). TGF-beta 1, -2, and -3 are highly pleiotropic cytokines that are thought to act as cellular switches regulating processes such as immune function, proliferation, and epithelial-mesenchymal transition (1–4). Each TGF-beta isoform has some non-redundant functions; for TGF-beta 1, targeted deletion in mice results in defects in hematopoietic and endothelial differentiation and death from severe inflammation (2). Human TGF-beta 1 cDNA encodes a 390-amino-acid (aa) precursor containing 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-beta 1 (8, 9). The disulfide-linked homodimer of LAP and TGF-beta 1 remains non-covalently associated after secretion, forming the small latent TGF-beta 1 complex (8–10). Covalent linkage of LAP to one of three latent TGF-beta binding proteins (LTBPs) forms a large latent complex that may interact with the extracellular matrix (9, 10). TGF-beta is activated from the latent state through pathways involving proteases such as plasmin,

matrix metalloproteinases, thrombospondin-1, and a group of integrins (10). Mature human TGF-beta 1 has 100% amino acid identity with porcine, canine, and bovine TGF-beta 1, and 99% amino acid identity with mouse, rat, and equine TGF-beta 1. It exhibits cross-species activity (1). TGF-beta 1 signaling begins with high-affinity binding to a type II serine/threonine kinase receptor termed TGF-beta RII. This receptor then phosphorylates and activates a second serine/threonine kinase receptor, TGF-beta RI (also called activin receptor-like kinase (ALK)-5), or alternatively, ALK-1. This complex phosphorylates and activates Smad proteins, which regulate transcription (3, 11, 12). The contribution of co-receptors such as betaglycan (also called TGF-beta RIII) and endoglin, or the use of Smad-independent signaling pathways, leads to the different effects observed in response to TGF-beta in different contexts (11).

Reference:

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