

# TGF- $\beta$ Signaling Pathway

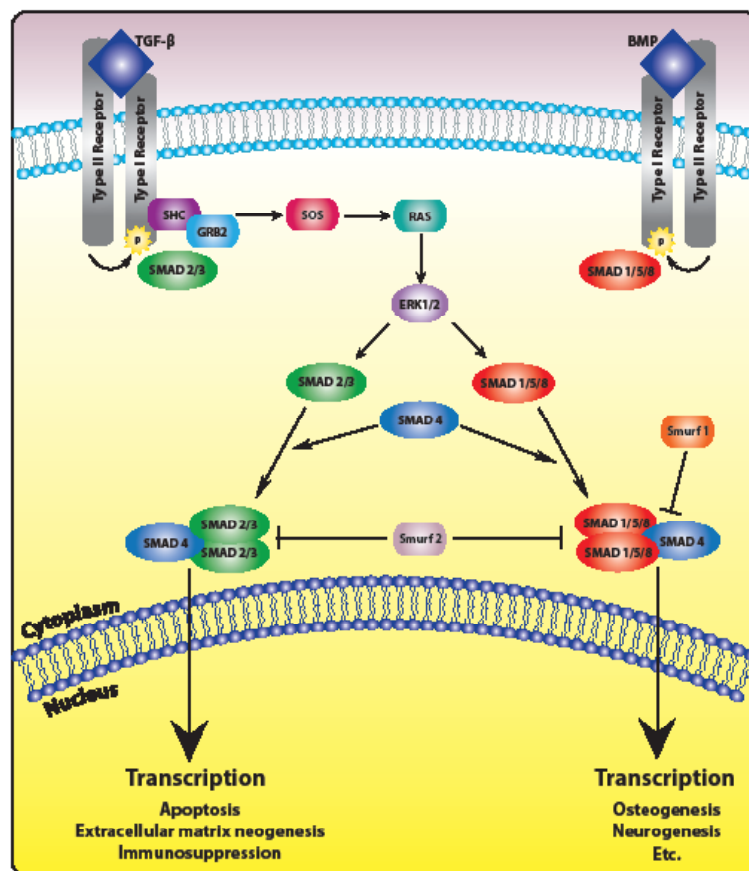
Transforming growth factor  $\beta$  (TGF- $\beta$ ) is a protein that controls proliferation, cellular differentiation, and other functions in most cells. TGF- $\beta$  family member binds to the Type II receptor and recruits Type I, whereby Type II receptor phosphorylates and activates Type I. The Type I receptor, in turn, phosphorylates receptor-activated Smads ( R-Smads: Smad1, Smad2, Smad3, Smad5, and Smad8). Once phosphorylated, R-Smads associate with the co-mediator Smad, Smad4, and the heteromeric complex then translocates into the nucleus. In the nucleus, Smad complexes activate specific genes through cooperative interactions with other DNA-binding and coactivator (or co-repressor) proteins.

In general, the release and activation of TGF- $\beta$  stimulates the production of various extracellular matrix proteins and inhibits the degradation of these matrix proteins which contributes to tissue repair. However, excessive TGF- $\beta$  may contribute to a pathologic excess of tissue fibrosis such as in renal fibrosis. Prolonged exposure of cells to hyperglycemia is the basis for a variety of diabetes-associated complications, including diabetic nephropathy, a major cause of diabetes-associated death.

An important factor in diabetic nephropathy is the extensive fibrosis, which appears to result from hyperactivity of TGF- $\beta$  signaling. It has been shown that leptin can stimulate mRNA expression and protein secretion of TGF- $\beta$ 1 which is one of the key regulators of extracellular matrix (ECM) genes in mesangial cells and can contribute to extracellular matrix deposition, glomerulosclerosis, and proteinuria.

As an additional note, studies have shown that in response to high glucose, cells can activate TGF- $\beta$  signaling through a direct enhancement of cell surface presentation of the TGF- $\beta$  receptors which has a direct effect on TGF- $\beta$  ligand activation. Finally, elevated glomerular TGF- $\beta$ 1 levels have been shown to make a significant contribution to the pathogenesis of diabetic glomerular lesions, including accumulation of type I collagen.

## TGF- $\beta$ Pathway



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Toll Free: 800-891-9699 (US Only)

## Antibodies

Product Name	Cat. No.	Size
BMP-14 Antibody	5580	30 µg, 100 µg
BMP-2 Antibody	5672	30 µg, 100 µg
BMP-3 Antibody	5573	100 µg
BMP-3 Antibody	5673	100 µg
BMP-3 Antibody	5673R	30 µg, 100 µg
BMP-3 Blocking Peptide	5673RBP	50 µg
BMP-4 Antibody	5674A	30 µg, 100 µg
BMP-4 Antibody	5674R	30 µg, 100 µg
BMP-5 Antibody	5574	30 µg, 100 µg
BMP-5 Antibody	5675R	30 µg, 100 µg
BMP-7 Antibody	5677	100 µg
BMP-7 Antibody	5677R	30 µg, 100 µg
CTGF Antibody	5553R	30 µg, 100 µg
Cyr61 Antibody	3648	30 µg, 100 µg
Decorin Antibody	3645A	30 µg, 100 µg
Decorin Antibody	3645R	30 µg, 100 µg
GFRalpha-1 Antibody	6201	100 µg
Mcl-1 Antibody	3035	30 µg, 100 µg
Smad1 Antibody	3461	30 µg, 100 µg
Smad4 Antibody	3464	30 µg, 100 µg
Smad5 Antibody	3465	100 µg
Smad7 Antibody	3670	30 µg, 100 µg
TAB1 Antibody	3682	100 µg
TGF-alpha Antibody	5339	30 µg, 100 µg
TGF-beta Receptor I Antibody	5636R	30 µg, 100 µg
TGF-beta Receptor I Blocking Peptide	5636RBP	50 µg
TGF-beta Receptor II Antibody	5639R	30 µg, 100 µg
TGF-beta Receptor II Blocking Peptide	5639RBP	50 µg
TGF-beta Receptor III Antibody	5642	100 µg
TGF-beta1 Antibody	5559	100 µg
TGF-beta2 Antibody	5340	30 µg, 100 µg
TGF-beta2 Antibody	5343R	30 µg, 100 µg
TGF-beta2 Blocking Peptide	5343RBP	50 µg
TGF-beta3 Antibody	5344R	30 µg, 100 µg
TGF-beta3 Blocking Peptide	5344RBP	50 µg

## Assay Kits

Product Name	Cat. No.	Size
BMP-2 (human) ELISA Kit	K4744	100 assays

## Proteins/Enzymes

Product Name	Cat. No.	Size
Activin A, human recombinant	4724	10 µg, 100 µg, 1 mg
Activin A, mouse recombinant	4725	10 µg, 100 µg, 1 mg
Activin A, rat recombinant	4726	10 µg, 100 µg, 1 mg
Human CellExp™ Activin A, Human Recombinant	6442	10 µg, 50 µg
CTGF, human recombinant	4702	20 µg, 100 µg 1 mg
Human Recombinant LEFTY-I	4873	10 µg, 50 µg
TGF-alpha, human recombinant	4339	20 µg, 100 µg 1 mg
TGF-beta1, human recombinant	4342	5 µg, 50 µg, 500 µg
TGF-beta2, human recombinant	4340	5 µg, 50 µg, 1 mg
TGF-beta2, human recombinant	4343	5 µg
TGF-beta3, human recombinant	4344	5 µg, 50 µg, 500 µg
TNF-beta, human recombinant	4345	20 µg, 1 mg
TGF-beta2 Antibody	5340	30 µg, 100 µg
TGF-beta2 Antibody	5343R	30 µg, 100 µg
TGF-beta2 Blocking Peptide	5343RBP	50 µg
TGF-beta3 Antibody	5344R	30 µg, 100 µg
TGF-beta3 Blocking Peptide	5344RBP	50 µg

## TGF-β Pathway Inhibitors

Product Name	Cat. No.	Size	CAS Number
A 83-01	1725	1 mg	909910-43-6
Dorsomorphin	1686	5 mg	866405-64-3
RepSox	1894	5 mg, 25 mg	446859-33-2
SB-431542	1674	1 mg, 5 mg	301836-41-9
EZSolution™ SB-431542	1872	1 mg	301836-41-9
EZSolution™ SB-431542, Sterile-Filtered	1992	1 ml	301836-41-9

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