

TGF- β Signaling

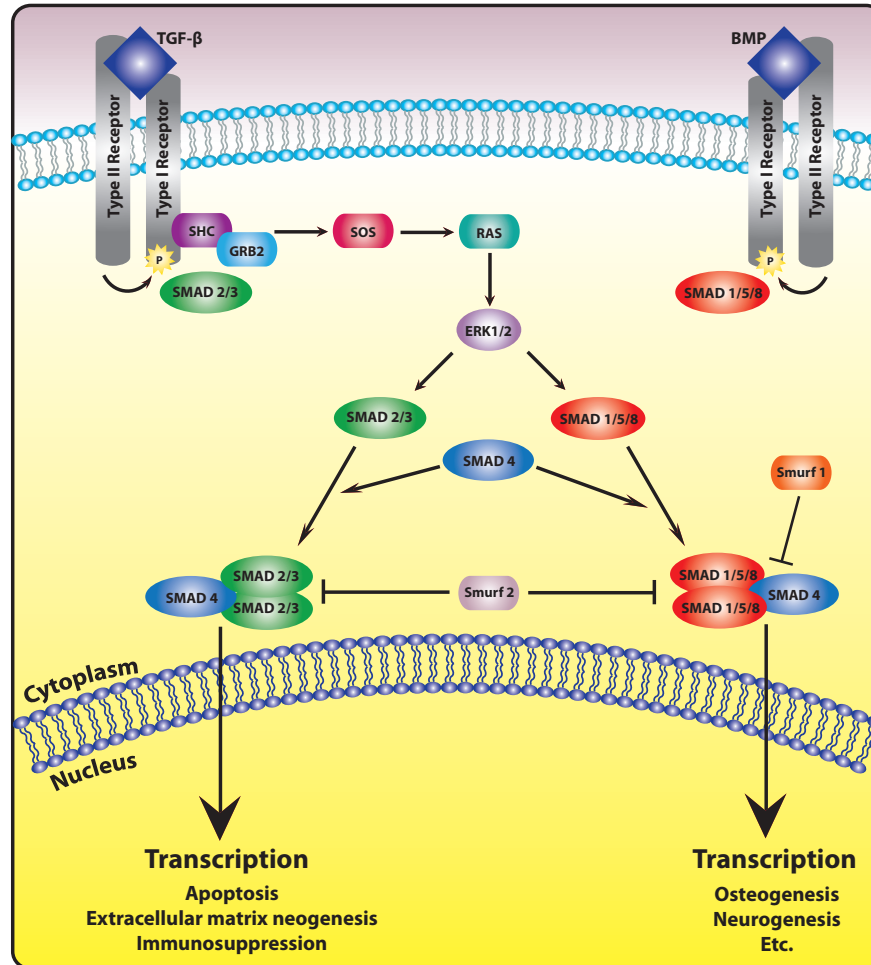
Transforming growth factor β (TGF- β) is a protein that controls proliferation, cellular differentiation, and other functions in most cells. TGF- β family member binds to the Type II receptor and recruits Type I, whereby Type II receptor phosphorylates and activates Type I. The Type I receptor, in turn, 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- β stimulates the production of various extracellular matrix proteins and inhibits the degradation of these matrix proteins which contributes to tissue repair. However, excessive TGF- β 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- β signaling. It has been shown that leptin can stimulate mRNA expression and protein secretion of TGF- β 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- β signaling through a direct enhancement of cell surface presentation of the TGF- β receptors which has a direct effect on TGF- β ligand activation. Finally, elevated glomerular TGF- β 1 levels have been shown to make a significant contribution to the pathogenesis of diabetic glomerular lesions, including accumulation of type I collagen.

TGF- β Pathway



Antibodies

Name	Cat. #
BMP-2 Antibody	5672-100
BMP-3 Antibody	5573-100
BMP-3 Antibody	5673-100
BMP-3 Antibody	5673R-100
BMP-3 Blocking Peptide	5673RBP-50
BMP-4 Antibody	5674A-100
BMP-4 Antibody	5674R-100
BMP-5 Antibody	5574-100
BMP-5 Antibody	5675R-100
BMP-7 Antibody	5677-100
BMP-7 Antibody	5677R-100
BMP-14 Antibody	5580-100
CTGF Antibody	5553R-100
Cyr61 Antibody	3648-100
Decorin Antibody	3645A-100
Decorin Antibody	3645R-100
GFRalpha-1 Antibody	6201-100
Mcl-1 Antibody	3035-100
Smad1 Antibody	3461-100
Smad4 Antibody	3464-100
Smad5 Antibody	3465-100
Smad7 Antibody	3670-100
TAB1 Antibody	3682-100
TGF-alpha Antibody	5339-100
TGF-beta Receptor I Antibody	5636R-100
TGF-beta Receptor I Blocking Peptide	5636RBP-50
TGF-beta Receptor II Antibody	5639R-100
TGF-beta Receptor II Blocking Peptide	5639RBP-50
TGF-beta Receptor III Antibody	5642-100
TGF-beta1 Antibody	5559-100
TGF-beta2 Antibody	5340-100
TGF-beta2 Antibody	5343R-100
TGF-beta2 Blocking Peptide	5343RBP-50
TGF-beta3 Antibody	5344R-100
TGF-beta3 Blocking Peptide	5344RBP-50

Proteins/Enzymes

Name	Cat. #
Activin A, human recombinant	4724-10, 100, 1000
Activin A, mouse recombinant	4725-10, 100, 1000
Activin A, rat recombinant	4726-10, 100, 1000
Activin A, Human Cell ^{exp} Human Recombinant	6442-10, 50
CTGF, human recombinant	4702-20, 100, 1000
Human Recombinant LEFTY-I	4873-10, 50
TGF-alpha, human recombinant	4339-20, 100, 1000
TGF-beta1, human recombinant	4342-5, 50, 500
TGF-beta2, human recombinant	4340-5, 50, 1000
TGF-beta2, human recombinant	4343-5
TGF-beta3, human recombinant	4344-5, 50, 500
TNF-beta, human recombinant	4345-20, 1000

TGF- β Pathway Inhibitors

Name	Cat. #
A 83-01	1725-1
Dorsomorphin	1686-5
RepSox	1894-5, 25
SB-431542	1674-1, 5
EZSolution™ SB-431542	1872-1
EZSolution™ SB-431542, Sterile-Filtered	1992-1

Assay Kits

Name	Cat. #
BMP-2 (human) ELISA Kit	K4744-100