Revision 2

Store at -20C

#77397

TGF-β Fibrosis Pathway Antibody Sampler Kit

1 Kit (9 x 20 microliters)

Cell Signaling TECHNOLOGY®

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For Research Use Only. Not for Use in Diagnostic Procedures.

Product Includes	Product #	Quantity	Mol. Wt	Isotype/Source
α-Smooth Muscle Actin (D4K9N) XP® Rabbit mAb	19245	20 µl	42 kDa	Rabbit IgG
COL1A1 (E8I9Z) Rabbit mAb	91144	20 µl	220 kDa	Rabbit IgG
SMAD2/3 (D7G7) XP® Rabbit mAb	8685	20 µl	52, 60 kDa	Rabbit IgG
SMAD2 (D43B4) XP® Rabbit mAb	5339	20 µl	60 kDa	Rabbit IgG
Phospho-SMAD2 (Ser465/Ser467) (E8F3R) Rabbit mAb	18338	20 µl	60 kDa	Rabbit IgG
YKL-40 (E2L1M) Rabbit mAb	47066	20 µl	30-40 kDa	Rabbit IgG
Phospho-SMAD2 (Ser465/467)/SMAD3 (Ser423/425) (D27F4) Rabbit mAb	8828	20 µl	52, 60 kDa	Rabbit IgG
TGF-β (56E4) Rabbit mAb	3709	20 µl	12, 45-60 kDa	Rabbit IgG
TGF-β Receptor II (E5M6F) Rabbit mAb	41896	20 µl	85 kDa	Rabbit IgG
Anti-rabbit IgG, HRP-linked Antibody	7074	100 µl		Goat

Please visit cellsignal.com for individual component applications, species cross-reactivity, dilutions, protocols, and additional product information.

Description

The TGF-β Fibrosis Pathway Antibody Sampler Kit provides an economical means of investigating activation of TGF-β/ SMAD2/3 signaling pathways in cells or tissues that lead to the expression of profibrotic genes, including expression of α-Smooth Muscle Actin in activated fibroblasts, and upregulation of Collagen1A1, Col11A1, and YKL-40. The kit includes enough antibodies to perform at least two western blot experiments with each primary antibody.

Storage

Supplied in 10 mM sodium HEPES (pH 7.5), 150 mM NaCl, 100 µg/ml BSA, 50% glycerol and less than 0.02% sodium azide. Store at –20°C. *Do not aliquot the antibody.*

Background

Transforming growth factor-β (TGF-β) superfamily members are critical regulators of cell proliferation and differentiation, developmental patterning and morphogenesis, and disease pathogenesis (1-4). In the context of fibrosis, TGF-β signaling to SMAD2/3 is one of the biggest drivers of the profibrotic program (5).

TGF-β elicits signaling through three cell surface receptors: type I (RI), type II (RII), and type III (RIII). In response to ligand binding, the type II receptors form stable heterotrimeric complexes with the type I receptors, allowing phosphorylation and activation of type I receptor kinase. Activated type I receptors associate with SMAD2/3 and phosphorylate them on a conserved carboxy terminal SSXS motif. The phosphorylated SMADs dissociate from the receptor and form a heterotrimeric complex with the co-Smad (Smad4), allowing translocation of the complex to the nucleus. Once in the nucleus, phosphorylated SMAD2/3 targets a subset of DNA binding proteins to regulate the transcriptional program (6-8).

In the context of fibrosis, SMAD2/3 activation upregulates expression of profibrotic genes such as *COL1A1* and other ECM modulators that modify the extracellular matrix of the tissue. (9). TGF-β/ SMAD2/3 signaling also induces expression of α-Smooth Muscle Actin in fibroblasts, causing transformation of these cells to myofibroblasts (10). Myofibroblasts further modify the ECM, causing excessive accumulation of collagens and other ECM components. Injury to the tissue attracts macrophages and other immune cells and the fibrotic tissue soon becomes a site of inflammation (11). In this pro-fibrotic, pro-inflammatory environment, YKL-40, also known as Chitinase-3-like protein 1 (CHI3L1), is secreted. YKL-40 is a pro-inflammatory glycoprotein that also contributes to the progression of fibrosis (12). Measurement of collagen content, α-Smooth Muscle Actin, and the release of YKL-40 are predictive of fibrotic activity.

Background References

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6. Wu, G. et al. (2000) *Science* 287, 92-7.
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Limited Uses