MSD® Phospho-Smad1 (Ser463/465) Kit

For quantitative determination in human and mouse whole cell lysate samples

Alzheimer's Disease
BioProcess
Cardiac
Cell Signaling
Clinical Immunology
Cytokines
Growth Factors
Hypoxia
Immunogenicity
Inflammation
Metabolic
Oncology
Toxicology
Vascular

Catalog Numbers

Phospho-Smad1(Ser463/465) Whole Cell Lysate Kit	
Kit size	
1 plate	K150LCD-1
5 plates	K150LCD-2
25 plates	K150LCD-4

Ordering information

MSD Customer Service
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Company Address

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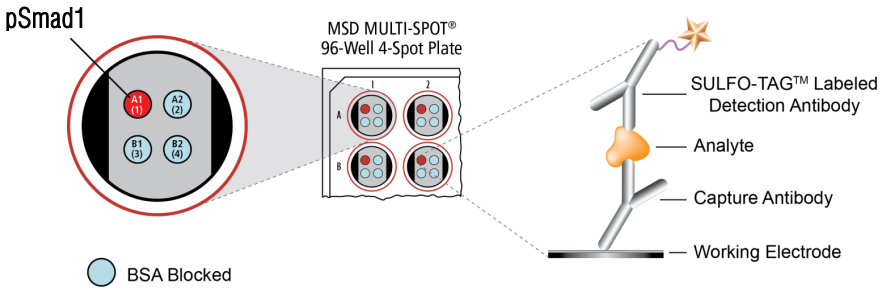
For Research Use Only.
Not for use in diagnostic procedures.



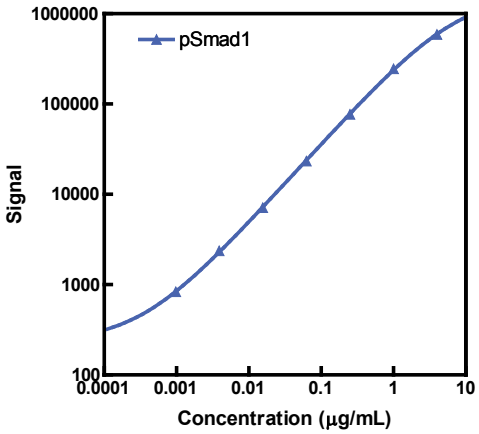
Smad1 (mothers against decapentaplegic homolog 1, MADH1) is a transcriptional modulator and key member of the transforming growth factor-β (TGF-β) signaling superfamily of proteins. Functionally, Smad1 is phosphorylated by the bone morphogenetic protein (BMP) receptor kinases at an evolutionarily conserved c-terminal binding motif, SSXS.[1] Smad1 phosphorylation occurs at serine 463 and serine 465 which activates Smad1 to form a complex with Smad4, translocate to the nucleus, interact with various co-activators and co-repressors, and bind to TGF-β-responsive target gene promoters. Through these actions, Smad1 regulates transcription of genes critical to stem cell renewal, cell proliferation, differentiation, migration, and apoptosis.[1,2]

Defects in Smad1 signaling have been shown to cause bone-related disorders such as osteoporosis and impact tumorigenesis. The availability of co-proteins varies significantly among different cell types and explains the cell type-dependent diversity of TGF-β-induced gene responses often observed in carcinogenesis.[1-3] Smad1 activation may be negatively regulated by extracellular signal-regulated kinase-1 (ERK) phosphorylation in the linker regions of Smad1, which inhibits nuclear translocation. Inhibitory Smads (Smad6 and Smad7) may compete for receptor kinase binding and target the protein for ubiquitination and proteasome-mediated degradation.[1,2] As TGF-β-Smad signaling is involved in many cellular activities, further study and comprehensive analysis are critical in guiding cancer and other disease research and clinical applications.

The MSD Phospho-Smad1 (Ser463/465) assay is available on 96-well 4-spot plates. This datasheet outlines the performance of the assay.

Typical Data

The following standard curve illustrates the dynamic range of the assay. Recombinant Smad1 protein was used to generate the data. Actual signals will vary. Best quantification of unknown samples will be achieved by generating a standard curve for each plate using a minimum of 2 replicates of standards.



	pSmad1	
Conc. (µg/mL)	Average Signal	%CV
0	151	3.3
0.00098	832	14.7
0.0039	2371	0.5
0.0156	7119	3.3
0.0625	23 327	2.5
0.25	76 846	7.6
1.0	245 640	0.5
4.0	588 487	1.2

MSD Advantage

- **Multiplexing:** Multiple analytes can be measured in one well using typical sample amounts of 25 µg/well or less without compromising speed or performance
- **Large dynamic range**: Linear range of up to five logs enables the measurement of native levels of biomarkers in normal and diseased samples without multiple dilutions
- **Minimal background:** The stimulation mechanism (electricity) is decoupled from the signal (light)
- **Simple protocols:** Only labels near the electrode surface are detected, enabling no-wash assays
- **Flexibility:** Labels are stable, non-radioactive, and conveniently conjugated to biological molecules
- **High sensitivity and precision:** Multiple excitation cycles of each label enhance light levels and improve sensitivity

For a complete list of products, please visit our website at www.mesoscale.com.

References

1. Kretzschmar M, Liu F, Hata A, Doody J, Massague J. The TGF-beta family mediator Smad1 is phosphorylated directly and activated functionally by the BMP receptor kinase. Genes Dev. 1997 11:984-95.
2. Lin Y, Martin J, Gruendler C, Farley J, Meng X, Li B-Y, Lechleider R, Huff C, Kim RH, Grasser WA, Paralkar V, Wang T. A novel link between the proteasome pathway and the signal transduction pathway of the bone morphogenetic proteins (BMPs). BMC Cell Biol. 2002 3:15.
3. Nagaraj NS, Datta PK. Targeting the transforming growth factor-beta signaling pathway in human cancer. Expert Opin Investig Drugs. 2010 Jan;19(1):77-91.