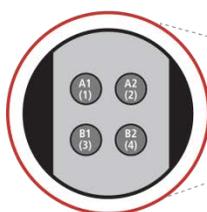


# MSD® Phospho(Thr180/Tyr182)/Total p38 Assay Whole Cell Lysate Kit

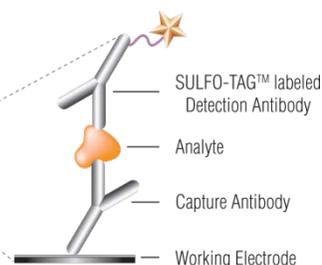
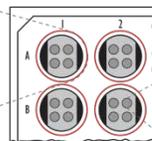
For quantitative determination in human, non-human primate, mouse, and rat whole cell lysate samples



1. Phospho-p38
2. BSA blocked
3. BSA blocked
4. Total p38



MSD MULTI-SPOT®  
96-Well 4-Spot Plate



The serine/threonine kinase p38 also known as RK, SAPK2A, and CSBP is involved in mediating cellular responses to inflammatory cytokines and environmental stresses such as osmotic shock and UV light.<sup>1</sup> Four isoforms ( $\alpha$ ,  $\beta$ ,  $\gamma$ ,  $\delta$ ) of p38 have been identified. Activation of p38 by phosphorylation of threonine 180 and tyrosine 182 is controlled by several upstream kinases including MKK3, MKK6, and MKK4 (SEK).<sup>2</sup> Activated p38 in turn can phosphorylate MAPKAPK2, PRAK kinase, and the transcription factors ATF-2, MAX, CHOP, and MEF2.<sup>3</sup> The p38 signaling pathway regulates various biological processes such as cytokine production, transcriptional regulation, cell proliferation, cell differentiation, and apoptosis.<sup>3</sup> The MSD Phospho(Thr180/Tyr182)/Total p38 assay is available on 96-well, 4-spot plates. This datasheet outlines the performance of the assay.

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

## Catalog Numbers

Phospho(Thr180/Tyr182)/ Total p38 Kit	
Kit Size	Catalog #
1 plate	K15112D-1
5 plates	K15112D-2
20 plates	K15112D-3

## Typical Data

Representative results for the Phospho(Thr180/Tyr182)/Total p38 Kit are illustrated below. The signal and ratio values provided are examples; individual results will vary depending upon the samples tested. Western blot analyses of each lysate type are shown for comparison.

Cell lysate from growing Jurkat cells treated with 50 nM calyculin A and 200 nM PMA for 15 minutes to stimulate phosphorylation (positive) or cell lysate from growing Jurkat treated cells treated with 1  $\mu$ M rapamycin for 3 hours to inhibit phosphorylation (negative) were added to MSD MULTI-SPOT®, 4-spot plates coated with anti-phospho-p38 (Thr180/Tyr182) antibody and anti-total p38 antibody on spatially distinct electrodes in each well. Phospho-p38 (Thr180/Tyr182) and total p38 were detected with anti-total p38 antibody conjugated with MSD SULFO-TAG™.

## Ordering Information

MSD Customer Service  
Phone: 1-301-947-2085  
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Email: CustomerService@mesoscale.com

## Scientific Support

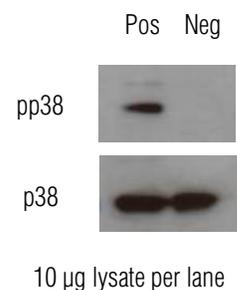
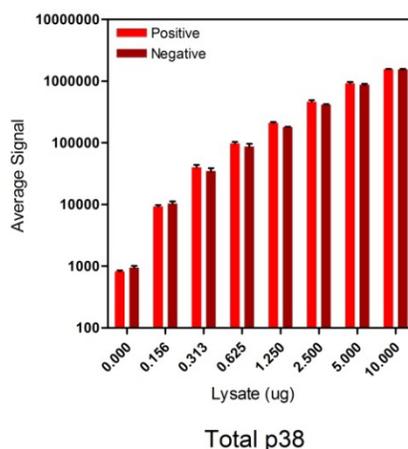
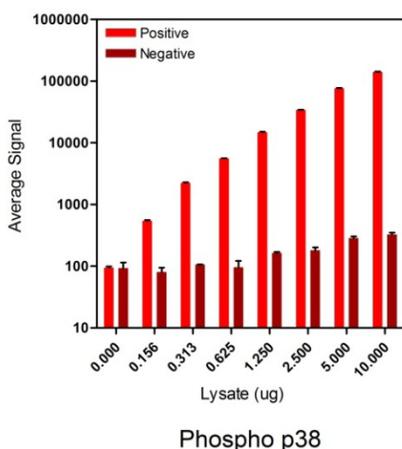
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## Company Address

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**Figure 1:** Sample data generated with Phospho(Thr180/Tyr182)/Total p38 Assay. Increased signal for phospho-p38 (Thr180/Tyr182) was observed with phospho-p38 positive cell lysates, and increased signal for total p38 was observed with both phospho-p38 positive and negative cell lysates. The Phospho(Thr180/Tyr182)/Total p38 Assay provides a measure of the data obtained with the traditional Western blot.

# MSD Cell Signaling Assays

## Lysate Titration

Data for positive (P) and negative (N) cell lysates assayed using the Phospho(Thr180/Tyr182)/Total p38 Kit are presented below.

	Lysate (µg)/well	Positive			Negative			P/N
		Average Signal	StdDev	%CV	Average Signal	StdDev	%CV	
Phospho-p38	0	95	4	4.5	93	22	23.7	
	0.156	543	18	3.3	80	14	17.7	7
	0.313	2245	47	2.1	106	1	0.7	21
	0.625	5570	68	1.2	96	26	27.4	58
	1.25	14 816	332	2.2	163	7	4.3	91
	2.5	34 217	237	0.7	181	20	10.9	189
	5	76 090	1631	2.1	286	18	6.4	266
	10	140 859	2039	1.4	326	24	7.4	432
Total p38	0	822	34	4.1	946	70	7.4	
	0.156	9302	467	5.0	10 390	849	8.2	0.9
	0.313	39 830	4074	10.2	35 001	3654	10.4	1.1
	0.625	97 571	5892	6.0	86 331	10 517	12.2	1.1
	1.25	208 741	9045	4.3	179 701	2821	1.6	1.2
	2.5	463 331	26 348	5.7	414 084	12 696	3.1	1.1
	5	921 919	49 876	5.4	874 227	33 256	3.8	1.1
	10	1 561 649	18 878	1.2	1 552 999	22 709	1.5	1.0

For a complete list of products, please visit our website at [www.mesoscale.com](http://www.mesoscale.com).

## The MSD Advantage

- **Multiplexing:** Multiple analytes can be measured in one well using typical sample volumes of 25 µL 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 response (light signal), minimizing matrix interference
- **Simple protocols:** Only labels bound near the electrode surface are excited, enabling assays with fewer washes
- **Flexibility:** Labels are stable, non-radioactive, and conveniently conjugated to biological molecules

## References

1. Rouse J, et al. A novel kinase cascade triggered by stress and heat shock that stimulates MAPKAP kinase-2 and phosphorylation of the small heat shock proteins. *Cell*. 1994 Sep 23;78(6):1027-37.
2. Raingeaud J, et al. Pro-inflammatory cytokines and environmental stress cause p38 mitogen-activated protein kinase activation by dual phosphorylation on tyrosine and threonine. *J Biol Chem*. 1995 Mar 31;270(13):7420-6.
3. Zarubin T, Han J. Activation and signaling of the p38 MAP kinase pathway. *Cell Res*. 2005 Jan;15(1):11-8.

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