

# MSD® VASP 3-Plex Whole Cell Lysate Kit

For quantitative determination of phosphorylated VASP (Ser157), phosphorylated VASP (Ser239), and Total VASP in human whole cell lysate samples



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

## Catalog Numbers

VASP 3-Plex  
Whole Cell Lysate Kit

Kit size

1 plate	K15127D-1
5 plates	K15127D-2
20 plates	K15127D-3

Phospho-VASP (Ser157/239)  
Whole Cell Lysate Set

200 µg C11FG-1

## Ordering information

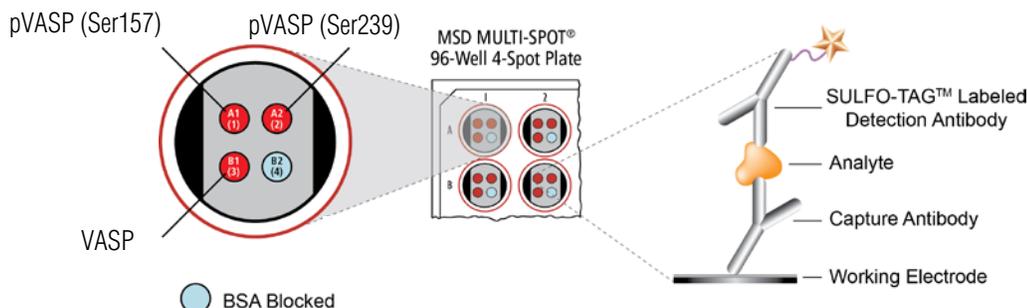
MSD Customer Service  
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## Company Address

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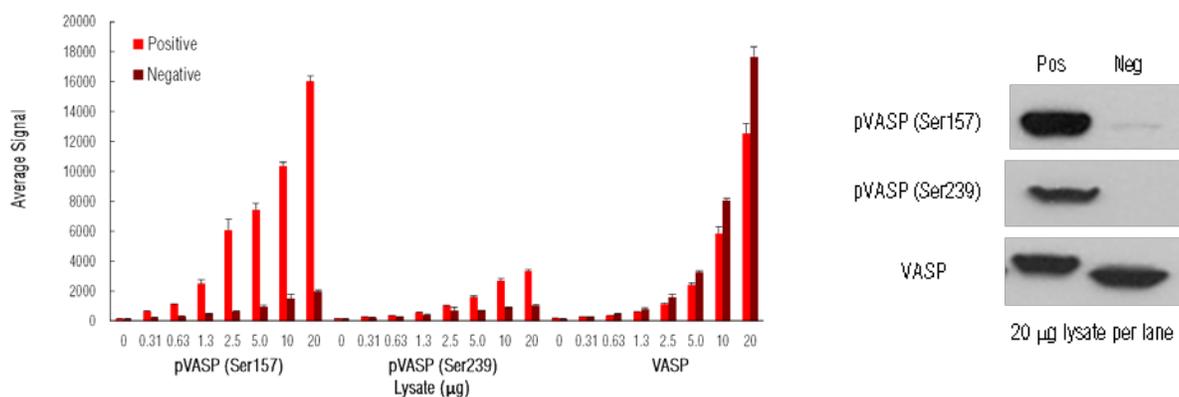
**Vasodilator-stimulated phosphoprotein (VASP)** is an adaptor protein which belongs to the Ena/VASP family of proteins and contains an EVH1 domain, EVH2 domain, and a proline rich region which binds to SH3 and WW domain containing proteins. It functions in cell motility, axon guidance, cell adhesion, endocytosis, and intracellular pathogen motility.<sup>1</sup> VASP binds to the growing barbed ends of actin filaments preventing capping proteins from binding and terminating actin elongation.<sup>2</sup> VASP is phosphorylated at Ser157 (PKA phosphorylation site), Ser239 (PKG phosphorylation site), and Thr278.<sup>3</sup> Phosphorylation is believed to inhibit VASP interactions with actin and decrease its anti-capping activity.<sup>4</sup> Due to its involvement in actin elongation, cell motility, and the signal transduction cascades, VASP plays a role in a variety of normal processes as well as in many diseases, such as cancer, arteriosclerosis, nephritis, thrombosis, and cardiomyopathy.<sup>5</sup>

The MSD VASP 3-Plex Assay is available on 96-well 4-spot plates. This datasheet outlines the performance of the assay.

## Typical Data

Representative results for the VASP 3-Plex Assay are illustrated below. The signal and ratio values provided are example data; individual results may vary depending upon the samples tested. Western blot analyses of each lysate type were performed with phospho-specific antibodies for the indicated phosphorylation sites and total VASP and are shown for comparison.

Growing A431 cells were starved overnight (negative) then treated with calyculin A (100 nM) and forskolin (100 µM) for 1 hour (positive). Whole cell lysates were added to MSD MULTI-SPOT® 4-Spot plates coated with anti-phospho-VASP (Ser157), anti-phospho-VASP (Ser239), and anti-total VASP antibodies on three of the four spatially distinct electrodes per well. Phosphorylated VASP and total VASP were detected with anti-total VASP antibody conjugated with MSD SULFO-TAG™.



**Fig. 1:** Sample data generated with MULTI-SPOT VASP 3-Plex Assay. The VASP 3-Plex Assay provides a quantitative measure of the data obtained with the traditional Western blot.

# MSD Phosphoprotein Assays

## Lysate Titration

Data for positive and negative A431 cell lysates using the MULTI-SPOT VASP 3-Plex are presented below.

	Lysate (µg)	Positive			Negative			P/N
		Average Signal	StdDev	%CV	Average Signal	StdDev	%CV	
pVASP (Ser157)	0	133	27	20.3	116	20	17.2	
	0.31	638	58	9.1	215	27	12.6	3.0
	0.63	1117	18	1.6	305	45	14.8	3.7
	1.3	2503	258	10.3	454	37	8.1	5.5
	2.5	6094	737	12.1	655	34	5.2	9.3
	5.0	7429	423	5.7	962	85	8.8	7.7
	10	10372	236	2.3	1518	236	15.5	6.8
	20	16000	387	2.4	1971	64	3.2	8.1
pVASP (Ser239)	0	160	6	3.8	147	15	10.2	
	0.31	272	27	9.9	218	38	17.4	1.2
	0.63	369	22	6.0	286	20	7.0	1.3
	1.3	557	24	4.3	410	19	4.6	1.4
	2.5	1021	52	5.1	700	199	28.4	1.5
	5.0	1609	50	3.1	715	16	2.2	2.3
	10	2687	180	6.7	896	24	2.7	3.0
	20	3319	102	3.1	1057	31	2.9	3.1
VASP	0	171	9	5.3	154	20	13.0	
	0.31	284	33	11.6	306	14	4.6	0.9
	0.63	388	16	4.1	479	12	2.5	0.8
	1.3	617	30	4.9	812	37	4.6	0.8
	2.5	1148	69	6.0	1597	166	10.4	0.7
	5.0	2418	97	4.0	3254	89	2.7	0.7
	10	5843	462	7.9	8092	115	1.4	0.7
	20	12529	667	5.3	17654	692	3.9	0.7

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# MSD Phosphoprotein Assays

## 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](http://www.mesoscale.com)

## References

1. Trichet L, Sykes C, Plastino J. Relaxing the actin cytoskeleton for adhesion and movement with Ena/VASP. *J Cell Biol.* 2008 Apr 7;181(1):19-25.
2. Bear JE, Svitkina TM, Krause M, Schafer DA, Loureiro JJ, Strasser GA, Maly IV, Chaga OY, Cooper JA, Borisy GG, Gertler FB. Antagonism between Ena/VASP proteins and actin filament capping regulates fibroblast motility. *Cell.* 2002 May 17;109(4):509-21.
3. Smolenski A, Bachmann C, Reinhard K, Hönig-Liedl P, Jarchau T, Hoschuetzky H, Walter U. Analysis and regulation of vasodilator-stimulated phosphoprotein serine 239 phosphorylation in vitro and in intact cells using a phosphospecific monoclonal antibody. *J Biol Chem.* 1988 Aug 7;273(32):20029-35.
4. Harbeck B, Hüttelmaier S, Schluter K, Jockusch BM, Illenberger S. Phosphorylation of the vasodilator-stimulated phosphoprotein regulates its interaction with actin. *J Biol Chem.* 2000 Oct 6;275(40):30817-25.
5. Pula G, Krause M. Role of Ena/VASP proteins in homeostasis and disease. *Handb Exp Pharmacol.* 2008;(186):39-65.

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