

# MSD® Total PERK Kit

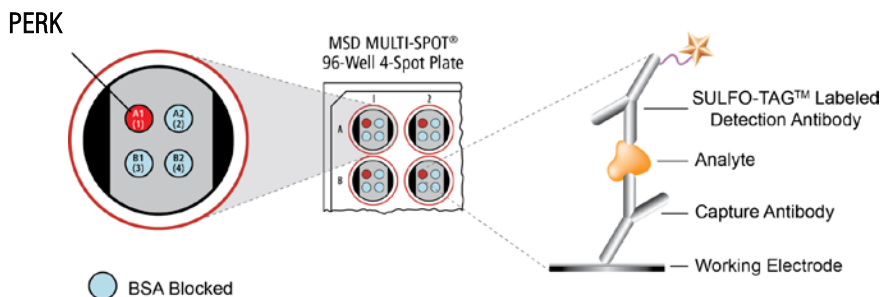
For quantitative determination in human, mouse, and rat whole cell lysate samples



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

## Catalog Numbers

Total PERK Kit	
Kit size	
1 plate	K150NID-1
5 plates	K150NID-2
25 plates	K150NID-4



**Protein kinase-like endoplasmic reticulum kinase (PERK)** is an endoplasmic reticulum (ER) transmembrane protein that mediates one of the three arms of unfolded protein response (UPR) adaptation to ER stressors. In response to the accumulation of mis-folded proteins in the ER lumen, PERK is activated by oligomerization and autophosphorylation at threonine 981 in humans and threonine 980 in rats.<sup>1</sup> Activated PERK phosphorylates eIF2 $\alpha$ (Ser51), resulting in global repression of translation.<sup>2,3</sup> PERK also induces translation of specific transcripts such as ATF4, a transcription factor that conversely induces expression of genes with products that reduce unfolded protein burden and pro-apoptotic CHOP.<sup>4</sup> Chronic PERK activation induces apoptosis. Increasing evidence suggests that ER stress and PERK activation are associated with adverse conditions such as diabetes, cancer, muscle degeneration, and neurodegenerative, bipolar, liver, cardiac, and autoimmune diseases.<sup>5-7</sup>

The MSD Total PERK assay is available on 96-well 4-spot plates. This datasheet outlines the performance of the assay.

## Assay Sensitivity

Total PERK	
LLOD (ng/mL)	0.040

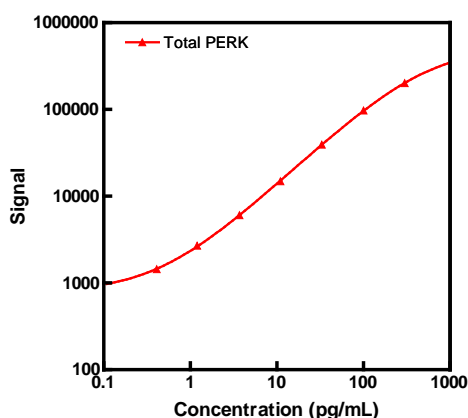
The lower limit of detection (LLOD) is a calculated concentration based on a signal 2.5 standard deviations above the background (zero calibrator blank).

## Ordering information

MSD Customer Service  
Phone: 1-301-947-2085  
Fax: 1-301-990-2776  
Email:  
CustomerService@mesoscale.

## Typical Standard Curve

The following standard curve is an example of the wide dynamic range of the Total PERK assay. Recombinant total PERK calibrator, obtained from an outside vendor, was diluted with MSD Diluent 100 to generate the representative data shown below.



Total PERK		
Conc. (ng/mL)	Average Signal	%CV
0	687	5.0
0.41	1444	2.8
1.2	2690	5.6
3.7	6034	3.8
11	14 849	1.6
33	39 228	0.8
100	97 315	1.8
300	200 772	2.1

## Company Address

MESO SCALE DISCOVERY®  
division of  
Meso Scale Diagnostics, LLC.  
9238 Gaithersburg Road  
Gaithersburg, MD 20877 USA  
[www.mesoscale.com](http://www.mesoscale.com)®

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

# MSD Phosphoprotein Assays

## 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 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. Parmar VM, Schröder M. Sensing endoplasmic reticulum stress. *Adv Exp Med Biol.* 2012;738:153-68.
2. Hershey, J. Protein Phosphorylation Controls Translation Rates. *JBC.* 1989 Dec 15; 264(35): 20823-20826.
3. Kimball, S.R. (1999) *Int. J. Biochem. Cell Biol.* 1999; 31: 25-29.
4. Harding, H.P. Protein Translation and Folding are coupled by an endoplasmic reticulum resident kinase. *Nature.* 1999; 397(6716): 271-274.
5. Fels DR, Koumenis C. The PERK/eIF2alpha/ATF4 module of the UPR in hypoxia resistance and tumor growth. *Cancer Biol Ther.* 2006 Jul;5(7):723-8.
6. Hetz C. The unfolded protein response: controlling cell fate decisions under ER stress and beyond. *Nat Rev Mol Cell Biol.* 2012 Jan 18;13(2):89-102.
7. Rath E, Haller D. Inflammation and cellular stress: a mechanistic link between immune-mediated and metabolically driven pathologies. *Eur J Nutr.* 2011 Jun;50(4):219-33.
8. Ozcan U, et al. Endoplasmic reticulum stress links obesity, insulin action, and type 2 diabetes. *Science.* 2004 Oct 15;306(5695):457-61.

MESO SCALE DISCOVERY, MESO SCALE DIAGNOSTICS, WWW.MESOSCALE.COM, MSD, MSD (DESIGN), DISCOVERY WORKBENCH, QUICKPLEX, MULTI-ARRAY, MULTI-SPOT, SULFO-TAG, SECTOR, SECTOR HTS, SECTOR PR, 4-SPOT (DESIGN) and SPOT THE DIFFERENCE are trademarks and/or service marks of Meso Scale Diagnostics, LLC.  
© 2012 Meso Scale Diagnostics, LLC. All rights reserved.

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

