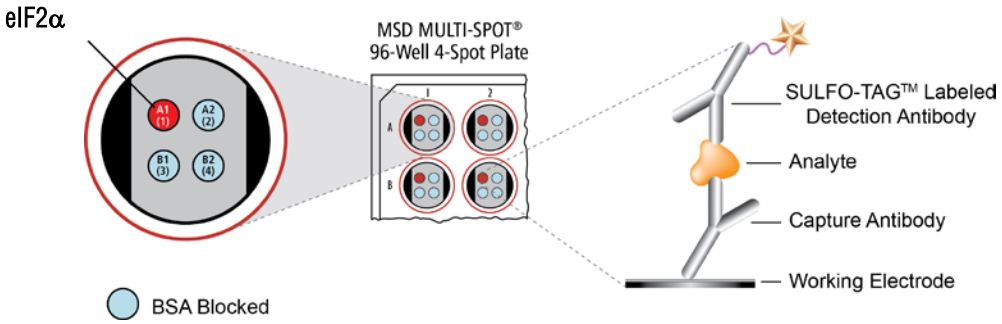
MSD® Total eIF2α Whole Cell Lysate Kit

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

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

Catalog Numbers

Total eIF2α Whole Cell Lysate Kit	
Kit Size	
1 plate	K150NGD-1
5 plates	K150NGD-2
25 plates	K150NGD-4



Eukaryotic protein synthesis is a tightly coordinated process consisting of initiation, elongation, and termination phases. Initiation of mRNA translation requires binding of Met-tRNA to the 40S ribosomal subunit.

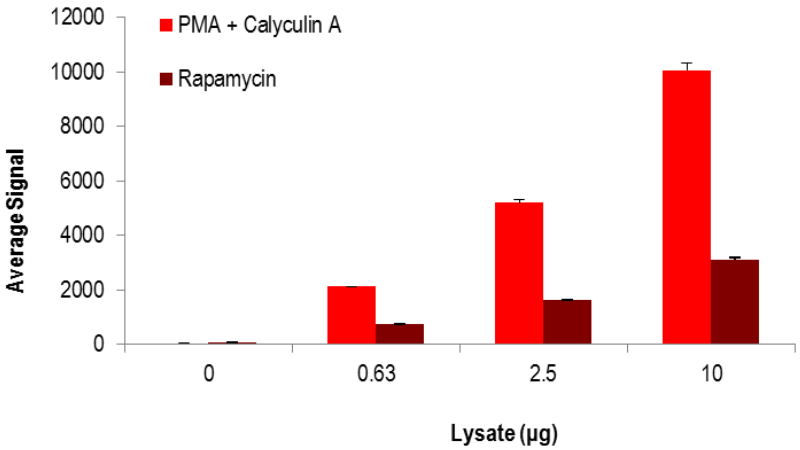
Eukaryotic translation initiation factor 2 (eIF2), a heterodimer consisting of alpha, beta, and gamma subunits, is an essential regulator of translational initiation. Active eIF2-GTP, Met-tRNA, and the 40S subunit form the ternary 43S preinitiation complex.[1,2] Once initiation is completed, inactive eIF2-GDP complex is ejected from the ribosome, and the guanine nucleotide exchange reaction catalyzed by eIF-2β recycles eIF2 to an active state, permitting additional rounds of initiation.[1,2] The alpha subunit, eIF2α, is the regulatory domain of the eIF2 heterotrimer; phosphorylation of eIF2α(Ser51) stabilizes the eIF2-GDP-eIF2β complex, globally repressing translation.[1,2]

Four eIF2α kinases have been identified to date, and each kinase responds to a different stressor. General control non-depressible-2 (GCN2) is activated during amino acid starvation;[3] protein kinase R (PKR) is activated in response to dsRNA;[4] PKR-like endoplasmic reticulum kinase is activated in response to accumulation of misfolded proteins in the endoplasmic reticulum;[5] and heme-regulated inhibitor (HRI) limits protein synthesis in heme-deficient cells.[6]

The MSD assay is available on 96-well, plates. This datasheet outlines the performance of the assay.

Typical Data

Representative results for the Kit are illustrated below. The signal and ratio values provided are examples; individual results may vary depending upon the samples tested.
with MSD SULFO-TAG reagent.



Ordering information

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Company Address

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Lysate Titration

Data for each treatment using the Kit is presented below.

Lysate	200 nM PMA+50 nM Calyculin A			1 µM Rapamycin		
(µg/Well)	Average Signal	StdDev	%CV	Average Signal	StdDev	%CV
0	42	5	11.9	57	6	9.9
0.63	2119	19	0.9	736	5	0.7
2.5	5196	122	2.3	1633	7	0.4
10	10060	273	2.7	3118	88	2.8

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. Hershey JW. Protein phosphorylation controls translation rates. J Biol Chem. 1989 Dec 15; 264(35):20823-6.
2. Kimball SR. Eukaryotic initiation factor eIF2. Int J Biochem Cell Biol. 1999 Jan;31(1):25-29.
3. Grallert B, Boye E. The Gcn2 kinase as a cell cycle regulator. Cell Cycle. 2007 Nov 15;6(22):2768-72.
4. Nalagatla SR, et al. Regulation of innate immunity through RNA structure and the protein kinase PKR.Curr Opin Struct Biol. 2011 Feb; 21(1):119-27.
5. Raven JF, Koromilas AE. PERK and PKR: Old kinases learn new tricks. Cell Cycle. 2008 May 1;7(9):1146-50.
6. Chen JJ. Regulation of protein synthesis by the heme regulated eIF2alpha kinase: relevance to anemias. Blood. 2007 Apr 1;109(7):2693-9.