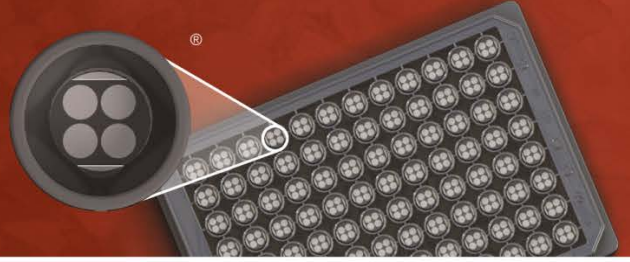
MSD® XBP-1 Kit

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

1. XBP-1
2. *BSA blocked*
3. *BSA blocked*
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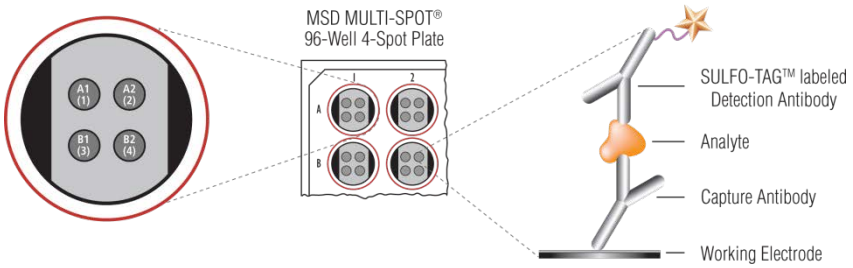

X-box binding protein 1 (XBP-1) is a basic-region, leucine zipper type transcription factor that belongs to the CREB/ATF family and mediates one of the three arms of unfolded protein response (UPR) adaptation to endoplasmic reticulum (ER) stressors. The accumulation of unfolded or misfolded proteins in the ER is a threat to cell survival and results in a condition known as ER-stress.[1,2] To overcome this stress, the ER initiates specific signaling pathways encompassed by the ER stress response.[3] Among these are translational attenuation, upregulation of ER chaperone proteins and proteins that facilitate folding, activation of NFkB signaling, and, as a last resort, the induction of apoptosis.[4-6] Under basal conditions, XBP-1 is ubiquitously expressed as a 33 kDa XBP-1u isoform. The initiation of ER stress activates the endonuclease activity of the transmembrane kinase and endoribonuclease inositol-requiring enzyme-1 (IRE-1) in an unconventional cleavage and re-ligation reaction producing an active 52 kDa splice-variant form of XBP-1 known as XBP-1s.[5] XBP-1s transcriptionally regulates the production of additional ER chaperones and secretory proteins to maintain the function of the organelle and the health of the cell.[6] XBP-1 is involved in the response of many diseases linked to ER stress (ischemia, neurodegeneration, cancer, diabetes), which makes this an attractive marker for many therapeutic areas. The MSD XBP-1 assay is available on 96-well, 4-spot plates. This datasheet outlines the performance of the assay.

Catalog Numbers

XBP-1 Kit	
Kit Size	**Catalog #**
1 plate	K150QKD-1
5 plates	K150QKD-2
25 plates	K150QKD-4

Ordering Information

MSD Customer Service
Phone: 1-301-947-2085
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Scientific Support

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Typical Data

Representative results for the XBP-1 Kit are illustrated below. The signal and ratio values provided are examples; individual results will vary depending upon the samples tested.

This assay was developed using recombinant human XBP-1 protein (data shown below) as well as with the nuclear fraction of rat hepatoma cells treated with the ER stress-inducing agents, thapsigargin and tunicamycin (data not shown). This assay recognizes both the spliced and non-spliced XBP-1 isoforms referred to in the introduction. Recombinant protein or nuclear cell lysate fractions were added to MULTI-SPOT®, 4-spot plates coated with anti-XBP-1 antibody on one of the four spatially distinct electrodes in each well. XBP-1 was detected with anti-XBP-1 antibody conjugated with MSD SULFO-TAG™.

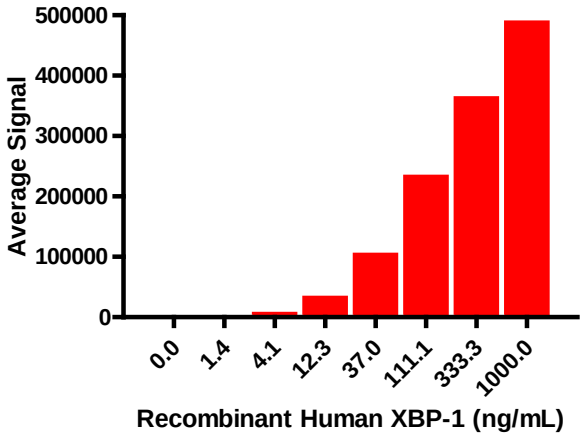

Figure 1: Sample data generated with the XBP-1 Kit. Increased signal is observed with the titration of recombinant human XBP-1 protein.

Lysate Titration

Data for recombinant XBP-1 protein using the XBP-1 Kit are presented below.

Sample (ng/mL)	XBP-1 Recombinant Protein		
	Average Signal	StdDev	%CV
0	150	9	5.7
1.4	2571	179	7.0
4.1	12 572	3036	24.2
12	39 175	4388	11.2
37	110 760	3928	3.5
111	239 750	11 727	4.9
333	369 889	11 688	3.2
1000	495 002	11 299	2.3

For a complete list of products, please visit our website at 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. Kopito RR. Aggresomes, inclusion bodies and protein aggregation. Trends Cell Biol. 2000 Dec;10(12):524-30.
2. Kaufman RJ. Stress signaling from the lumen of the endoplasmic reticulum: coordination of gene transcriptional and translational controls. Genes Dev. 1999 May 15;13(10):1211-33.
3. Mori K. Tripartite management of unfolded proteins in the endoplasmic reticulum. Cell. 2000 May 26;101(5):451-4.
4. Harding HP, et al. Transcriptional and translational control in the Mammalian unfolded protein response. Annu Rev Cell Dev Biol. 2002;18:575-99.
5. Yoshida H, et al. XBP1 mRNA is induced by ATF6 and spliced by IRE1 in response to ER stress to produce a highly active transcription factor. Cell. 2001 Dec 28;107(7):881-91.
6. Lee AH, et al. XBP-1 regulates a subset of endoplasmic reticulum resident chaperone genes in the unfolded protein response. Mol Cell Biol. 2003 Nov;23(21):7448-59.