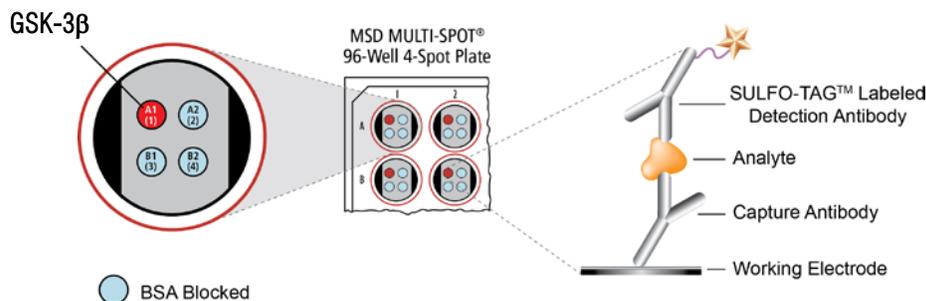
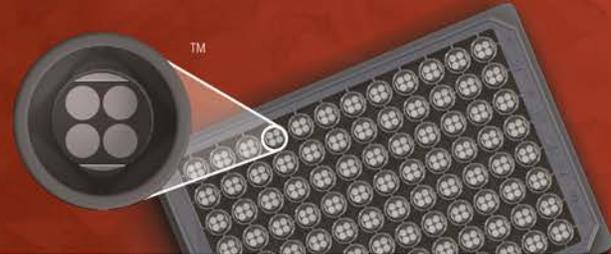


# MSD® Total GSK-3β Assay Whole Cell Lysate Kit

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



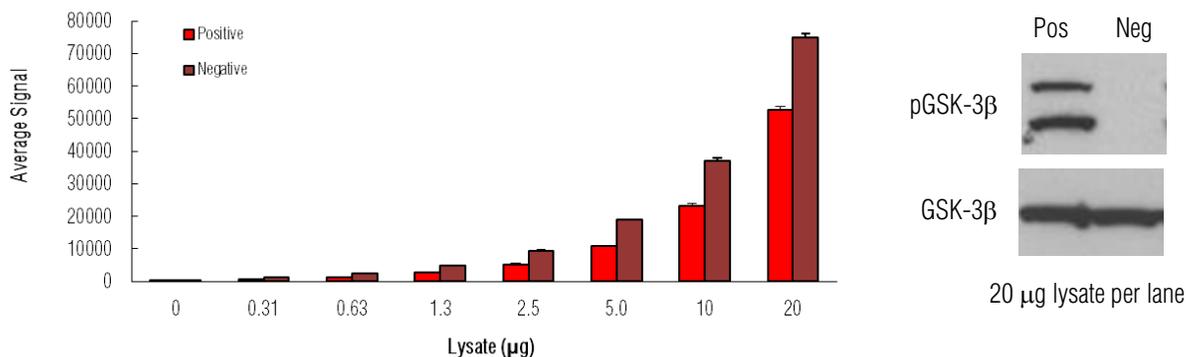
**Glycogen synthase kinase-3 (GSK-3)** is a serine/threonine protein kinase that is found in two cellular isoforms  $-\alpha$  and  $-\beta$ . GSK-3 has diverse cellular effects including involvement in metabolism, embryonic development, and cell survival. The two isoforms are regulated through phosphorylation, with inhibition as a result of growth factor and insulin-mediated phosphorylation by Akt on Ser 21 (GSK-3 $\alpha$ ) and Ser 9 (GSK-3 $\beta$ ). The inhibition of GSK-3 $\alpha$ /GSK-3 $\beta$  results in the dephosphorylation and activation of substrates such as glycogen synthase, eIF-2B, and C/EBP $\alpha$  causing increased protein and glycogen synthesis. Tyrosine (216) phosphorylation of GSK-3 $\beta$  results in its activation and the subsequent phosphorylation of various cellular proteins including cyclin D-1 and  $\beta$ -catenin. An important member of the Wnt signaling pathway, GSK-3 plays a role in cell fate in early embryonic development. GSK-3 $\beta$  has also been implicated in the progression of Alzheimer's disease through the phosphorylation of the microtubule-associated protein tau.

The MSD Total GSK-3 $\beta$  Assay is available on 96-well 4-Spot plates. This datasheet outlines the performance of the assay.

## Typical Data

Representative results for the Total GSK-3 $\beta$  Assay are illustrated below. The signal and ratio values provided below are example data; individual results may vary depending upon the samples tested. Western blot analyses of each lysate type were performed with Phospho-GSK-3 $\beta$  (Ser9) and total GSK-3 $\beta$  antibodies and are shown below for comparison.

Logarithmically growing Jurkat cells (positive) were treated with LY294002 (50  $\mu$ M; 2.5 hours) and staurosporine (1  $\mu$ M; 2.5 hours) (negative). Whole cell lysates were added to MSD MULTI-SPOT® 4-Spot plates coated with anti-total GSK-3 $\beta$  antibody on one of the four spatially distinct electrodes within a well. Total GSK-3 $\beta$  was detected with anti-total GSK-3 $\beta$  antibody conjugated with MSD SULFO-TAG™ reagent.



**Fig. 1:** Sample data generated with the MULTI-ARRAY® Total GSK-3 $\beta$  Assay. Increased signal is observed with the titration of both pGSK-3 $\beta$  positive and negative cell lysate. The Total GSK-3 $\beta$  Assay provides a quantitative measure of the data obtained with the traditional Western blot.

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

## Catalog Numbers

Total GSK-3 $\beta$  Assay: Whole Cell Lysate Kit

### Kit size

|           |           |
|-----------|-----------|
| 1 plate   | K150CRD-1 |
| 5 plates  | K150CRD-2 |
| 20 plates | K150CRD-3 |

Phospho-GSK-3 $\beta$  Whole Cell Lysate Set

|             |         |
|-------------|---------|
| 200 $\mu$ g | C11CQ-1 |
|-------------|---------|

## Ordering information

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

## Company Address

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Gaithersburg, MD 20877 USA

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

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Not for use in diagnostic procedures.

# MSD Phosphoprotein Assays

## Lysate Titration

Data for pGSK-3 $\beta$  positive and negative Jurkat cell lysates using the MULTI-ARRAY Total GSK-3 $\beta$  Assay are presented below.

| Lysate<br>( $\mu$ g) | Positive       |        |     | Negative       |        |      | P/N |
|----------------------|----------------|--------|-----|----------------|--------|------|-----|
|                      | Average Signal | StdDev | %CV | Average Signal | StdDev | %CV  |     |
| 0                    | 66             | 2      | 2.3 | 88             | 16     | 18.3 |     |
| 0.31                 | 674            | 39     | 5.8 | 1182           | 71     | 6.0  | 0.6 |
| 0.63                 | 1350           | 79     | 5.9 | 2423           | 51     | 2.1  | 0.6 |
| 1.3                  | 2689           | 30     | 1.1 | 4885           | 307    | 6.3  | 0.6 |
| 2.5                  | 5260           | 293    | 5.6 | 9353           | 381    | 4.1  | 0.6 |
| 5.0                  | 10893          | 147    | 1.3 | 18864          | 834    | 4.4  | 0.6 |
| 10                   | 23058          | 886    | 3.8 | 37117          | 400    | 1.1  | 0.6 |
| 20                   | 52589          | 1193   | 2.3 | 74802          | 3876   | 5.2  | 0.7 |

## MSD Advantage

- **Multiplexing:** Multiple analytes can be measured in one well using typical sample amounts of 25  $\mu$ g/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 using MSD's platform for the measurement of phosphoproteins

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