

# GSK-3 $\alpha/\beta$ (0011-A): sc-7291

## BACKGROUND

Glycogen synthase kinase 3, or GSK-3, is a serine/threonine, proline-directed kinase involved in a diverse array of signaling pathways, including glycogen synthesis and cellular adhesion, and has been implicated in Alzheimer's disease. Two forms of GSK-3, designated GSK-3 $\alpha$  and GSK-3 $\beta$ , have been identified and differ in their subcellular localization. Tau, a microtubule-binding protein which serves to stabilize microtubules in growing axons, is found to be hyper-phosphorylated in paired helical filaments (PHF), the major fibrous component of neurofibrillary lesions associated with Alzheimer's disease. Hyperphosphorylation of Tau is thought to be the critical event leading to the assembly of PHF. Six Tau protein isoforms have been identified, all of which are phosphorylated by GSK-3. This presents the possibility that miscues in GSK-3 signaling contribute to the onset of Alzheimer's disease.

## CHROMOSOMAL LOCATION

Genetic locus: GSK3A (human) mapping to 19q13.2, GSK3B (human) mapping to 3q13.33; Gsk3a (mouse) mapping to 7 A3, Gsk3b (mouse) mapping to 16 B3.

## SOURCE

GSK-3 $\alpha/\beta$  (0011-A) is a mouse monoclonal antibody raised against amino acids 1-420 representing full length glycogen synthase kinase-3 $\beta$  of *Xenopus* origin.

## PRODUCT

Each vial contains 200  $\mu$ g IgG<sub>2a</sub> kappa light chain in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

GSK-3 $\alpha/\beta$  (0011-A) is available conjugated to agarose (sc-7291 AC), 500  $\mu$ g/0.25 ml agarose in 1 ml, for IP; to HRP (sc-7291 HRP), 200  $\mu$ g/ml, for WB, IHC(P) and ELISA; to either phycoerythrin (sc-7291 PE), fluorescein (sc-7291 FITC), Alexa Fluor<sup>®</sup> 488 (sc-7291 AF488), Alexa Fluor<sup>®</sup> 546 (sc-7291 AF546), Alexa Fluor<sup>®</sup> 594 (sc-7291 AF594) or Alexa Fluor<sup>®</sup> 647 (sc-7291 AF647), 200  $\mu$ g/ml, for WB (RGB), IF, IHC(P) and FCM; and to either Alexa Fluor<sup>®</sup> 680 (sc-7291 AF680) or Alexa Fluor<sup>®</sup> 790 (sc-7291 AF790), 200  $\mu$ g/ml, for Near-Infrared (NIR) WB, IF and FCM.

Alexa Fluor<sup>®</sup> is a trademark of Molecular Probes, Inc., Oregon, USA

## APPLICATIONS

GSK-3 $\alpha/\beta$  (0011-A) is recommended for detection of GSK-3 $\alpha$  and GSK-3 $\beta$  of mouse, rat, human, canine and *Xenopus* origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000), immunoprecipitation [1-2  $\mu$ g per 100-500  $\mu$ g of total protein (1 ml of cell lysate)], immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500), immunohistochemistry (including paraffin-embedded sections) (starting dilution 1:50, dilution range 1:50-1:500) and flow cytometry (1  $\mu$ g per 1 x 10<sup>6</sup> cells).

Molecular Weight of GSK-3 $\alpha$ : 51 kDa.

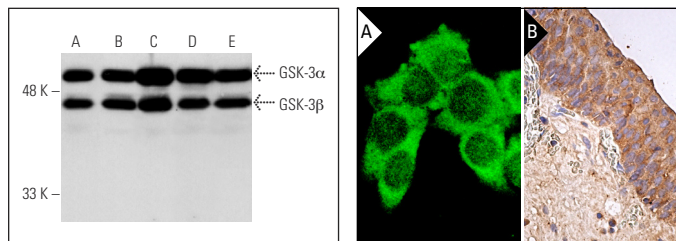
Molecular Weight of GSK-3 $\beta$ : 47 kDa.

Positive Controls: MDCK cell lysate: sc-2252, HeLa whole cell lysate: sc-2200 or A549 cell lysate: sc-2413.

## STORAGE

Store at 4° C, **\*\*DO NOT FREEZE\*\***. Stable for one year from the date of shipment. Non-hazardous. No MSDS required.

## DATA



GSK-3 $\alpha/\beta$  (0011-A): sc-7291. Western blot analysis of GSK-3 expression in MDCK (A), HeLa (B), A549 (C), SK-BR-3 (D) and Jurkat (E) whole cell lysates.

GSK-3 $\alpha/\beta$  (0011-A): sc-7291. Immunofluorescence staining of methanol-fixed HeLa cells showing cytoplasmic localization (A). Immunoperoxidase staining of formalin fixed, paraffin-embedded human urinary bladder tissue showing cytoplasmic staining of urothelial cells (B).

## SELECT PRODUCT CITATIONS

- Graef, I.A., et al. 1999. L-type calcium channels and GSK-3 regulate the activity of NF-ATc4 in hippocampal neurons. *Nature* 401: 703-708.
- Tlili, A., et al. 2013. Hepatocyte-specific Dyrk1a gene transfer rescues plasma apolipoprotein A-I levels and aortic Akt/GSK3 pathways in hyperhomocysteinemic mice. *Biochim. Biophys. Acta* 1832: 718-728.
- Azzolin, L., et al. 2014. YAP/TAZ incorporation in the  $\beta$ -catenin destruction complex orchestrates the Wnt response. *Cell* 158: 157-170.
- Kearney, A.Y., et al. 2015. 8-chloroadenosine sensitivity in renal cell carcinoma is associated with AMPK activation and mTOR pathway inhibition. *PLoS ONE* 10: e0135962.
- Jin, J., et al. 2016. Mutational analysis of glycogen synthase kinase 3 $\beta$  protein kinase together with kinome-wide binding and stability studies suggests context-dependent recognition of kinases by the chaperone heat shock protein 90. *Mol. Cell. Biol.* 36: 1007-1018.
- Liu, Y.Y., et al. 2017. PI3K/AKT signaling pathway activation in a rat model of migraine. *Mol. Med. Rep.* 16: 4849-4854.
- Hsu, P.H., et al. 2018. Focused ultrasound-induced blood-brain barrier opening enhances GSK-3 inhibitor delivery for Amyloid- $\beta$  plaque reduction. *Sci. Rep.* 8: 12882.
- Obianom, O.N., et al. 2019. Triazole-based inhibitors of the Wnt/ $\beta$ -catenin signaling pathway improve glucose and lipid metabolism in diet-induced obese mice. *J. Med. Chem.* 62: 727-741.
- López-Soldado, I., et al. 2020. Maintenance of liver glycogen during long-term fasting preserves energy state in mice. *FEBS Lett.* 594: 1698-1710.

## RESEARCH USE

For research use only, not for use in diagnostic procedures.