SANTA CRUZ BIOTECHNOLOGY, INC.

p-GSK-3α/β (6D3): sc-81496

SANTA CRUZ BIOTECHNOLOGY

The Power to Question

BACKGROUND

Glycogen synthase kinase-3α (GSK-3α) and GSK-3β are highly similar isoforms of serine/threonine kinases that regulate metabolic enzymes and transcription factors, which are responsible for coordinating processes such as glycogen synthesis and cell adhesion. GSK-3β activity is also required for nuclear activity of Rel dimers, which mediate an anti-apoptotic response to TNFα in mice. GSK-3 catalytic kinase activity is controlled through differential phosphorylation of serine/threonine residues, which have an inhibitory effect, and tyrosine residues, which have an activating effect. Growth factor stimulation of mammalian cells expressing GSK-3α and GSK-3β induces phosphorylation of Ser 21 and Ser 9, respectively, through a phosphatidylinositol 3-kinase (PI 3-K)-protein kinase B (PKB)-dependent pathway, thereby enhancing proliferative signals. Additionally, GSK-3 physically associates with cAMP-dependent protein kinase A (PKA), which phosphorylates Ser 21 of GSK-3α or Ser 9 of GSK-3β and inactivates both forms. GSK-3α/β is positively regulated by phosphorylation on Tyr 279 and Tyr 216, respectively. Activated GSK-3α/β participates in energy metabolism, neuronal cell development, and body pattern formation. Tyrosine dephosphorylation of GSK-3 is involved in its extracellular signal-dependent inactivation.

REFERENCES

1. Plyte, S.E., et al. 1992. Glycogen synthase kinase-3: functions in oncogenesis and development. Biochim. Biophys. Acta 1114: 147-162.
2. Stambolic, V., et al. 1994. Mitogen inactivation of glycogen synthase kinase-3β in intact cells via serine 9 phosphorylation. Biochem. J. 303: 701-704.

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

p-GSK-3α/β (6D3) is a mouse monoclonal antibody raised against phosphopeptide corresponding to amino acid residues surrounding Tyr 279 of GSK-3α and Tyr 216 of GSK-3β of human origin.

PRODUCT

Each vial contains 50 µg IgG_1 kappa light chain in 0.5 ml of PBS with < 0.1% sodium azide, 0.1% gelatin, PEG and sucrose.

APPLICATIONS

p-GSK-3α/β (6D3) is recommended for detection of Tyr 279 phosphorylated GSK-3α and Tyr 216 phosphorylated GSK-3β of mouse, rat and human origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000) and immunoprecipitation [1-2 µg per 100-500 µg of total protein (1 ml of cell lysate)].

Molecular Weight of p-GSK-3α: 51 kDa.

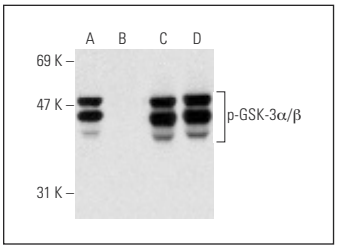
Molecular Weight of p-GSK-3β: 47 kDa.

Positive Controls: GSK-3α (h2): 293T Lysate: sc-116382, Hs68 cell lysate: sc-2230 or Jurkat whole cell lysate: sc-2204.

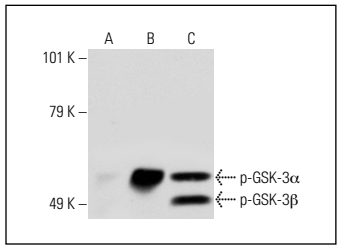
STORAGE

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

DATA



Western blot analysis of GSK-3α/β phosphorylation in untreated (**A**,**C**) and lambda protein phosphatase (sc-200312A) treated (**B**,**D**) Hs68 whole cell lysates. Antibodies tested include p-GSK-3α/β (6D3): sc-81496 (**A**,**B**) and GSK-3α/β (5J105): sc-71190 (**C**,**D**).



p-GSK-3α/β (6D3): sc-81496. Western blot analysis of GSK-3α phosphorylation in non-transfected 293T: sc-117752 (**A**), human GSK-3α transfected 293T: sc-116382 (**B**) and Jurkat (**C**) whole cell lysates.

SELECT PRODUCT CITATIONS

1. Riggio, M., et al. 2012. PI3K/Akt pathway regulates phosphorylation of steroid receptors, hormone independence and tumor differentiation in breast cancer. Carcinogenesis 33: 509-518.
2. Das, A., et al. 2015. A novel component from citrus, ginger, and mushroom family exhibits antitumor activity on human meningioma cells through suppressing the Wnt/β-catenin signaling pathway. Tumour Biol. 36: 7027-7034.
3. Park, Y.Y., et al. 2016. The p90 ribosomal S6 kinase 2 specifically affects mitotic progression by regulating the basal level, distribution and stability of mitotic spindles. Exp. Mol. Med. 48: e250.
4. Han, X., et al. 2018. miRNA-29a inhibits colon cancer growth by regulation of the PTEN/Akt/GSK3β and Wnt/β-catenin signaling pathways. Oncol. Lett. 16: 2638-2644.
5. Zhang, W.Q., et al. 2019. Sodium butyrate improves liver glycogen metabolism in type 2 diabetes mellitus. J. Agric. Food Chem. 67: 7694-7705.
6. Kim, I.H., et al. 2020. PYP1-4 peptide from *Pyropia yezoensis* protects against acetaminophen-induced hepatotoxicity in Hep G2 cells. Exp. Ther. Med. 19: 849-860.
7. Yin, S.W., et al. 2020. Effects of mild intrauterine hypoperfusion in the second trimester on memory and learning function in rat offspring. Neural Regen. Res. 15: 2082-2088.
8. Jin, M.H., et al. 2020. Peroxiredoxin I deficiency increases pancreatic β-cell apoptosis after streptozotocin stimulation via the Akt/GSK3β signaling pathway. Mol. Med. Rep. 22: 1831-1838.
9. Wang, X., et al. 2021. Gastrodin alleviates perioperative neurocognitive dysfunction of aged mice by suppressing neuroinflammation. Eur. J. Pharmacol. 892: 173734.

RESEARCH USE

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