

p-GSK-3 α (9B8): sc-81497

BACKGROUND

Glycogen synthase kinase-3 α (GSK-3 α) and GSK-3 β 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-3 β activity is also required for nuclear activity of Rel dimers, which mediate an anti-apoptotic response to TNF α 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-3 α and GSK-3 β 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-3 α or Ser 9 of GSK-3 β and inactivates both forms. GSK-3 α/β is positively regulated by phosphorylation on Tyr 279 and Tyr 216, respectively. Activated GSK-3 α/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. and Woodgett, J.R. 1994. Mitogen inactivation of glycogen synthase kinase-3 β in intact cells via serine 9 phosphorylation. *Biochem. J.* 303: 701-704.
3. Wang, Q.M., et al. 1994. Glycogen synthase kinase-3 β is a dual specificity kinase differentially regulated by tyrosine and serine/threonine phosphorylation. *J. Biol. Chem.* 269: 14566-14574.
4. Murai, H., et al. 1996. Tyrosine dephosphorylation of glycogen synthase kinase-3 is involved in its extracellular signal-dependent inactivation. *FEBS Lett.* 392: 153-160.
5. Shaw, M., et al. 1997. Further evidence that the inhibition of glycogen synthase kinase-3 β by IGF-1 is mediated by PDK1/PKB-induced phosphorylation of Ser-9 and not by dephosphorylation of Tyr-216. *FEBS Lett.* 416: 307-311.

CHROMOSOMAL LOCATION

Genetic locus: GSK3A (human) mapping to 19q13.2; Gsk3a (mouse) mapping to 7 A3.

SOURCE

p-GSK-3 α (9B8) is a mouse monoclonal antibody raised against phosphopeptide corresponding to amino acid residues surrounding Ser 21 of GSK-3 α of human origin.

PRODUCT

Each vial contains 50 μ g IgG₁ in 0.5 ml of PBS with < 0.1% sodium azide, 0.1% gelatin, PEG and sucrose.

APPLICATIONS

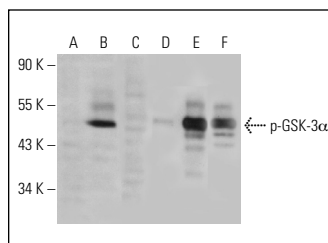
p-GSK-3 α (9B8) is recommended for detection of Ser 21 phosphorylated GSK-3 α of mouse, rat, human and canine origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000), immunoprecipitation [1-2 μ g per 100-500 μ g of total protein (1 ml of cell lysate)] and immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500); non cross-reactive with the homologous phosphorylation site in GSK-3 β .

Suitable for use as control antibody for GSK-3 α siRNA (h): sc-29339, GSK-3 α siRNA (m): sc-35526, GSK-3 α shRNA Plasmid (h): sc-29339-SH, GSK-3 α shRNA Plasmid (m): sc-35526-SH, GSK-3 α shRNA (h) Lentiviral Particles: sc-29339-V and GSK-3 α shRNA (m) Lentiviral Particles: sc-35526-V.

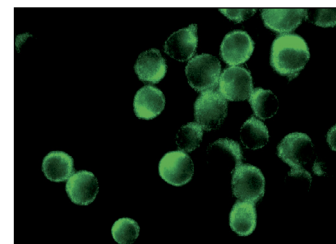
Molecular Weight of p-GSK-3 α : 51 kDa.

Positive Controls: HeLa whole cell lysate: sc-2200 or Jurkat whole cell lysate: sc-2204.

DATA



Western blot analysis of GSK-3 α phosphorylation in non-transfected: sc-117752 (A,D), untreated human GSK-3 α transfected: sc-114699 (B,E) and lambda protein phosphatase (sc-200312A) treated human GSK-3 α transfected: sc-114699 (C,F) 293T whole cell lysates. Antibodies tested include p-GSK-3 α (9B8): sc-81497 (A,B,C) and GSK-3 α (C-20): sc-1844 (D,E,F).



p-GSK-3 α (9B8): sc-81497. Immunofluorescence staining of methanol-fixed Hep G2 cells showing cytoplasmic localization.

SELECT PRODUCT CITATIONS

1. Xi, J., et al. 2018. Celastrol inhibits glucocorticoid-induced osteoporosis in rat via the PI3K/Akt and Wnt signaling pathways. *Mol. Med. Rep.* 18: 4753-4759.
2. Szykowska, A., et al. 2019. Conjugated linoleic acids diminish glycogen synthase and glycogen synthase kinase-3 expression in muscle cells of C57BL/6J mice—*in vitro* and *in vivo* study. *J. Physiol. Pharmacol.* 70: 943-953.
3. Amaral, C.L.D., et al. 2022. Activation of the $\alpha 7$ nicotinic acetylcholine receptor prevents against microglial-induced inflammation and Insulin resistance in hypothalamic neuronal cells. *Cells* 11: 2195.

STORAGE

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

RESEARCH USE

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