

p-GSK-3 α (Ser 21): sc-16308

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.

CHROMOSOMAL LOCATION

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

SOURCE

p-GSK-3 α (Ser 21) is available as either goat (sc-16308) or rabbit (sc-16308-R) polyclonal affinity purified antibody raised against a short amino acid sequence containing Ser 21 phosphorylated GSK-3 α of human origin.

PRODUCT

Each vial contains 200 μ g IgG in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

Blocking peptide available for competition studies, sc-16308 P, (100 μ g peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% BSA).

RESEARCH USE

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

APPLICATIONS

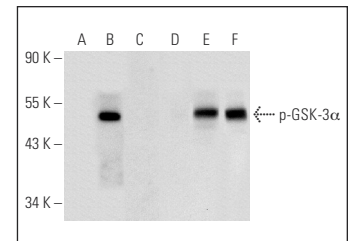
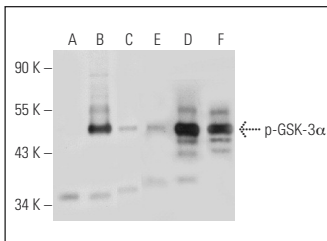
p-GSK-3 α (Ser 21) is recommended for detection of Ser 21 phosphorylated GSK-3 α of mouse, rat and human origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000), immunoprecipitation [1-2 μ g per 100-500 μ g of total protein (1 ml of cell lysate)], immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

Suitable for use as control antibody for GSK-3 α siRNA (h): sc-29339, 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 (Ser 21)-R: sc-16308-R (A, B, C) and GSK-3 α (H-75): sc-7879 (D, E, F).

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 treated human GSK-3 α transfected: sc-114699 (C, F) 293T whole cell lysates. Antibodies tested include p-GSK-3 α (Ser 21)-R: sc-16308-R (A, B, C) and GSK-3 α (H-75): sc-7879 (D, E, F).

SELECT PRODUCT CITATIONS

1. Lin, C.F., et al. 2007. GSK-3 β acts downstream of PP2A and the PI 3-kinase-Akt pathway, and upstream of caspase-2 in ceramide-induced mitochondrial apoptosis. *J. Cell Sci.* 120: 2935-2943.

STORAGE

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

PROTOCOLS

See our web site at www.scbt.com or our catalog for detailed protocols and support products.


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Guaranteed

Try **p-GSK-3 α (E-2): sc-365483** or **p-GSK-3 α (8.Ser 21): sc-293134**, our highly recommended monoclonal alternatives to p-GSK-3 α (Ser 21).