SANTA CRUZ BIOTECHNOLOGY, INC.

p-GSK-3α (Ser 21): sc-101690

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.
3. Wang, Q.M., et al. 1994. Glycogen synthase kinase-3β 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-3β 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.
6. van Weeren, P.C., et al. 1998. Essential role for protein kinase B (PKB) in Insulin-induced glycogen synthase kinase 3 inactivation. Characterization of dominant-negative mutant of PKB. J. Biol. Chem. 273: 13150-13156.
7. Brady, M.J., et al. 1998. The activation of glycogen synthase by Insulin switches from kinase inhibition to phosphatase activation during adipogenesis in 3T3-L1 cells. J. Biol. Chem. 273: 14063-14066.

CHROMOSOMAL LOCATION

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

SOURCE

p-GSK-3α (Ser 21) is a rabbit polyclonal antibody raised against a short amino acid sequence containing Ser 21 phosphorylated GSK-3α of human origin.

PRODUCT

Each vial contains 100 µg IgG in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

APPLICATIONS

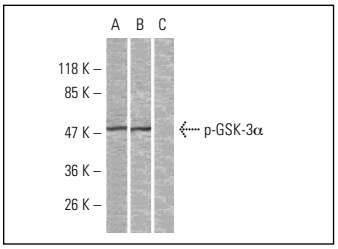
p-GSK-3α (Ser 21) is recommended for detection of Ser 21 phosphorylated GSK-3α of mouse, rat and human origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000), immunoprecipitation [1-2 µg per 100-500 µg of total protein (1 ml of cell lysate)], immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500) and immunohistochemistry (including paraffin-embedded sections) (starting dilution 1:50, dilution range 1:50-1:500).

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

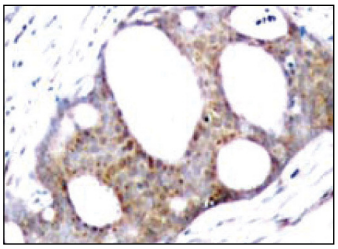
Molecular Weight of p-GSK-3α: 51 kDa.

Positive Controls: Jurkat whole cell lysate: sc-2204, HeLa whole cell lysate: sc-2200 or human ovary cancer whole cell lysate.

DATA



Western blot analysis of phosphorylated GSK-3α expression in A2780 human ovary cancer whole cell lysate. Blots were probed with p-GSK-3α (Ser 21): sc-101690 (**A,B**) and p-GSK-3α (Ser 21): sc-101690 preincubated with cognate phosphorylated peptide (**C**).



p-GSK-3α (Ser 21): sc-101690. Immunoperoxidase staining of formalin-fixed, paraffin-embedded human breast carcinoma tissue showing cytoplasmic staining.

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.