



# Recombinant Human Glycogen synthase kinase-3 beta (GSK3B)

**Product Code** CSB-EP009963HU

**Relevance**

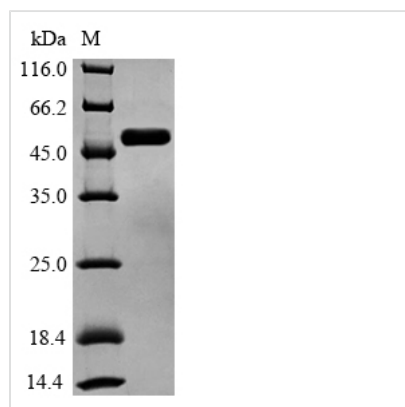
Constitutively active protein kinase that acts as a negative regulator in the hormonal control of glucose homeostasis, Wnt signaling and regulation of transcription factors and microtubules, by phosphorylating and inactivating glycogen synthase (GYS1 or GYS2), EIF2B, CTNNB1/beta-catenin, APC, AXIN1, DPYSL2/CRMP2, JUN, NFATC1/NFATC, MAPT/TAU and MACF1. Requires primed phosphorylation of the majority of its substrates. In skeletal muscle, contributes to insulin regulation of glycogen synthesis by phosphorylating and inhibiting GYS1 activity and hence glycogen synthesis. May also mediate the development of insulin resistance by regulating activation of transcription factors. Regulates protein synthesis by controlling the activity of initiation factor 2B (EIF2BE/EIF2B5) in the same manner as glycogen synthase. In Wnt signaling, GSK3B forms a multimeric complex with APC, AXIN1 and CTNNB1/beta-catenin and phosphorylates the N-terminus of CTNNB1 leading to its degradation mediated by ubiquitin/proteasomes. Phosphorylates JUN at sites proximal to its DNA-binding domain, thereby reducing its affinity for DNA. Phosphorylates NFATC1/NFATC on conserved serine residues promoting NFATC1/NFATC nuclear export, shutting off NFATC1/NFATC gene regulation, and thereby opposing the action of calcineurin. Phosphorylates MAPT/TAU on 'Thr-548', decreasing significantly MAPT/TAU ability to bind and stabilize microtubules. MAPT/TAU is the principal component of neurofibrillary tangles in Alzheimer disease. Plays an important role in ERBB2-dependent stabilization of microtubules at the cell cortex. Phosphorylates MACF1, inhibiting its binding to microtubules which is critical for its role in bulge stem cell migration and skin wound repair. Probably regulates NF-kappa-B (NFKB1) at the transcriptional level and is required for the NF-kappa-B-mediated anti-apoptotic response to TNF-alpha (TNF/TNFA). Negatively regulates replication in pancreatic beta-cells, resulting in apoptosis, loss of beta-cells and diabetes. Through phosphorylation of the anti-apoptotic protein MCL1, may control cell apoptosis in response to growth factors deprivation. Phosphorylates MUC1 in breast cancer cells, decreasing the interaction of MUC1 with CTNNB1/beta-catenin. Is necessary for the establishment of neuronal polarity and axon outgrowth. Phosphorylates MARK2, leading to inhibit its activity. Phosphorylates SIK1 at 'Thr-182', leading to sustain its activity. Phosphorylates ZC3HAV1 which enhances its antiviral activity. Phosphorylates SNAI1, leading to its BTRC-triggered ubiquitination and proteasomal degradation. Phosphorylates SFPQ at 'Thr-687' upon T-cell activation. Phosphorylates NR1D1 at 'Ser-55' and 'Ser-59' and stabilizes it by protecting it from proteasomal degradation. Regulates the circadian clock via phosphorylation of the major clock components including ARNTL/BMAL1, CLOCK and PER2. Phosphorylates CLOCK at 'Ser-427' and targets it for proteasomal degradation. Phosphorylates ARNTL/BMAL1 at 'Ser-17' and 'Ser-21' and primes it for ubiquitination and proteasomal degradation. Phosphorylates OGT at 'Ser-3' or 'Ser-4' which positively regulates its activity. Phosphorylates MYCN in neuroblastoma cells which may promote its



degradation

|                          |   |
|--------------------------|---|
| <b>Storage</b>           | The shelf life is related to many factors, storage state, buffer ingredients, storage temperature and the stability of the protein itself. Generally, the shelf life of liquid form is 6 months at -20°C/-80°C. The shelf life of lyophilized form is 12 months at -20°C/-80°C.   |
| <b>Uniprot No.</b>       | P49841  |
| <b>Alias</b>             | Serine/threonine-protein kinase GSK3B   |
| <b>Product Type</b>      | Recombinant Protein   |
| <b>Immunogen Species</b> | Homo sapiens (Human)  |
| <b>Purity</b>            | Greater than 90% as determined by SDS-PAGE.   |
| <b>Sequence</b>          | MSGRPRTTSFAESCKPVQQPSAFGSMKVS RDKD GSKVTTVVATPGQGPDRP<br>QEVSYTDTKVINGNSFGV VYQAKLCDSGELVAIKKVLQDKRFKNRELQIMRKL<br>DHCNIVRLRYFFYSSGEKKDEVYLNLVLDYVPETVYRVARHYSRAKQTLPIYV<br>KLYMYQLFRSLAYIHSFGICH RDIKPQNLLLD PDTAVLKL CDFGSAKQLVRGEP<br>NVS YICSRYYRAPELIFGATDY TSSIDVWSAGCVLA ELLLGQPIFP GDSGVDQL<br>VEI IKVLGTP TREQUIREMNP NYTEFKFPQ IKAHPWTKVFRP RTPPEAIALCS RLL<br>EYTP TARLTPLEACAHSFFDEL RDPNVKLPNGR DTPALFNFTTQELSSNPPLAT<br>ILIPPHARIQAAASTPTNATAASDANTGDRGQTNNAASASASNST |
| <b>Research Area</b>     | Signal Transduction   |
| <b>Source</b>            | E.coli  |
| <b>Target Names</b>      | GSK3B   |
| <b>Expression Region</b> | 1-420aa   |
| <b>Notes</b>             | Repeated freezing and thawing is not recommended. Store working aliquots at 4°C for up to one week.   |
| <b>Tag Info</b>          | N-terminal 6xHis-tagged   |
| <b>Mol. Weight</b>       | 50.7kDa   |
| <b>Protein Length</b>    | Full Length   |

**Image**



(Tris-Glycine gel) Discontinuous SDS-PAGE (reduced) with 5% enrichment gel and 15% separation gel.

**Description**

The production of this Recombinant Human GSK3B protein started with the GSK3B gene synthesis. And then using recombinant DNA technology, the



GSK3B gene was inserted into an expression vector so that we could get the recombinant express plasmid of GSK3B. Transform the plasmid into the cells of E.coli, culture the cells and we could get the desired Recombinant Human GSK3B protein. But the work was not completed, protein purification and a strict QC system were performed in the last step. The purity is 90%+ determined by SDS-PAGE.

GSK3B is a gene providing an instruction of making a protein named glycogen synthase kinase-3 beta (GSK-3 beta) in human. The protein encoded by this gene is also known as serine/threonine-protein kinase GSK3B (GSK3B) and belongs to protein kinase superfamily. GSK3B protein is a kinase that plays a pivotal role in numerous cellular functions from modulation of microtubule dynamics and cell death. Increasing evidence has implied that deregulation of GSK3beta activity in the adult brain is involved in several CNS disorders, such as affective disorders, schizophrenia and neurodegenerative diseases.

---

**Reconstitution**

We recommend that this vial be briefly centrifuged prior to opening to bring the contents to the bottom. Please reconstitute protein in deionized sterile water to a concentration of 0.1-1.0 mg/mL. We recommend to add 5-50% of glycerol (final concentration) and aliquot for long-term storage at -20°C/-80°C. Our default final concentration of glycerol is 50%. Customers could use it as reference.

---

**Shelf Life**

The shelf life is related to many factors, storage state, buffer ingredients, storage temperature and the stability of the protein itself. Generally, the shelf life of liquid form is 6 months at -20°C/-80°C. The shelf life of lyophilized form is 12 months at -20°C/-80°C.