Product Information

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Anti-phospho-Tau (pThr^{212})
produced in rabbit, affinity isolated antibody

Catalog Number **T6944**

Anti-phospho-Tau (pThr^{212}) is produced in rabbit using as immunogen a synthetic phosphopeptide derived from the region of tau that contains Thr^{212}. The sequence is conserved in many species. The serum is affinity purified using epitope-specific affinity chromatography. The antibody is preadsorbed to remove any reactivity towards a non-phosphorylated tau.

Anti-phospho-Tau (pThr^{212}) recognizes human, mouse, rat, goat, bovine, baboon, and rhesus monkey tau (pThr^{212}). The antibody has been used in immunoblotting.

Tau is a microtubule-associated phosphoprotein (MAP), localized in neuronal axons. It promotes tubulin polymerization and stabilizes microtubules.[1] The biological activity of tau is regulated by its degree of phosphorylation.[1, 2] Hyperphosphorylated tau is the major protein of the paired helical filaments (PHFs), which make up the pathological neurofibrillary tangles of Alzheimer's disease (AD). The PHFs are also found in the lesions of other central nervous system disorders.[3, 4]

Tau phosphorylation involves numerous kinases: glycogen synthase kinase 3β (GSK-3β), MARK kinase, MAP kinase, protein kinase A and C, cyclin-dependent kinase 5 (Cdk5), p38 kinase, c-Jun N-terminal kinase, and casein kinase II.[1-2, 5-7] Combined tau protein kinase II (TPKII), which consists of Cdk5 and GSK-3β, is the most potent phosphorylation agent indirectly involved in the regulation of the phosphorylation state of tau in neuronal cells.[6, 8] In addition, tau is phosphorylated *in vitro* by osmotic cellular stress, which activates the stress-activated protein kinases (SAPKs).

25 abnormal phosphorylation sites have been identified on hyperphosphorylated tau in AD brain.[10] Normal tau has approximately eight phosphorylation sites. The abnormal phosphorylation occurs usually on serine and threonine residues. Specifically, TPKII phosphorylates serines 202 and 404. GSK-3β transfection phosphorylates serines 199, 202, 235, 396, 404 and 413, and threonines 205 and 231.

These sites are among the major abnormal phosphorylation sites of tau.[11] Phosphorylation on these sites reduces the ability of given tau species to promote microtubule self-assembly.[11,12] Okadaic acid increases phosphorylation at Thr^{231} and serines 235, 396 and 404. Phosphorylated Ser^{422} was found in the biopsies of brains from patients with Down syndrome, amyotropic lateral sclerosis, corticobasal degeneration, and Pick's disease. It was absent from control group of normal brains.[13]

The opposite process, tau dephosphorylation, is controlled by different protein phosphatases expressed in neurons. Protein phosphatases PP2A and PP2B efficiently dephosphorylate tau *in vitro* and restore biological activity in the assembly of microtubules.[3,10,14]

Recently it was discovered that propyl isomerase (Pin 1) interacts with tau hyperphosphorylated on Thr^{231} and restores the ability of tau to bind to microtubules.

Reagent
Supplied as a solution in Dulbecco's phosphate buffered saline (without Mg^{2+} and Ca^{2+}), 50% glycerol with 1 mg/mL bovine serum albumin (IgG, protease free), and 0.05% sodium azide.

Precautions and Disclaimer
This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Storage/Stability
Store at –20 °C. For extended storage, freeze in working aliquots. Avoid repeated freezing and thawing to prevent denaturing the antibody. Working dilution samples should be discarded if not used within 12 hours.

Product Profile
Immunoblotting: a recommended working dilution of 1:1,000 is recommended using human, recombinant Tau untreated or treated with GSK-3β.

Note: In order to obtain the best results in various techniques and preparations, we recommend determining optimal working concentration by titration.

References

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