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ProductInformation

Anti-phospho-Tau [pThr^{231}]
produced in rabbit, affinity isolated antibody

Catalog Number **T7194**

Product Description

Anti-phospho-Tau [pThr^{231}] is developed in rabbit using a synthetic phosphopeptide derived from the region of human Tau that contains Thr^{231} as immunogen. The serum is affinity purified using epitope-specific affinity chromatography. The antibody is pre-adsorbed to remove any reactivity towards a non-phosphorylated Tau.

Anti-phospho-Tau [pThr^{231}] specifically recognizes human Tau [pThr^{231}) in immunoblotting, 45-68 kDa. Mouse and rat Tau, 100% homologous, have not been tested, but are expected to react.

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.[1,2,5,6,7] 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).

To date, a total of 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 Ser^{202} and Ser^{404}. GSK-3β, transfection phosphorylates Ser^{199}, Ser^{202}, Ser^{235}, Ser^{396}, Ser^{404} and Ser^{413}, and Thr^{205} and Thr^{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 Ser^{235}, Ser^{396} and Ser^{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 (Pin1) interacts with Tau hyperphosphorylated on Thr^{231} and restores the ability of Tau to bind to microtubules.

Reagent

Sufficient for 10 immunoblots. Supplied as a solution in Dulbecco's phosphate buffered saline (without Mg^{2+} and Ca^{2+}), pH 7.3, containing 50% glycerol, 1.0 mg/mL BSA (IgG, protease free) and 0.05% sodium azide.

Storage/Stability

Store at –20 °C. For extended storage, upon initial thawing, 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 working dilution of 1:1000 is determined using recombinant human Tau treated with GSK-3ß. Peptide competition studies demonstrate the specificity of the antibody – only the phosphopeptide immunogen blocks the antibody signal,

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

References

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AH,PHC 02/06-1