Product Datasheet

Biological Description

Specificity	Phospho-Tau (Ser202/Thr205) Antibody [M2L8] recognizes endogenous levels of total Tau protein only when phosphorylated at both Ser202 and Thr205.
Background	Phospho-Tau (Ser202/Thr205) refers to tau protein phosphorylated at serine 202 and threonine 205, two adjacent residues within the proline-rich region of this microtubule-associated protein. Tau is an intrinsically disordered protein that stabilizes and promotes the assembly of microtubules. Phosphorylation at Ser202/Thr205 induces a conformational change that extends the N-terminal region and increases the spacing between microtubules in neurites. These sites are phosphorylated by kinases such as Cdk5, GSK-3β, PKA, and casein kinase II, with Cdk5 preferentially phosphorylating Thr205 before Ser202, and the phosphorylation order influenced by tau's association with microtubules. Phosphorylation at these sites regulates tau's microtubule-binding affinity, generally reducing its ability to stabilize microtubules and contributing to cytoskeletal destabilization. Hyperphosphorylation at Ser202/Thr205 is a key event in neurodegenerative diseases, leading to tau aggregation and the formation of neurofibrillary tangles, which are characteristic of Alzheimer's disease and other tauopathies. The phosphorylation state at these residues is also modulated by various phosphatases, including PP2A, PP2B, and PP5, which are more effective than PP1 at dephosphorylating tau at these sites. These modifications alter tau's conformation, microtubule interactions, and cellular localization, and play a central role in disease progression by impairing neuronal function and promoting tau pathology.

Usage Information

Application	WB	Dilution	WB 1:1000
Reactivity	Human, Mouse, Rat		
Source	Rabbit Monoclonal Antibody	MW	55-80 kDa
Storage Buffer	PBS, pH 7.2+50% Glycerol+0.05% BSA+0.01% NaN3		
Storage (from the date of receipt)	-20°C (avoid freeze-thaw cycles), 2 years		

Experimental Methods

WB

Experimental Protocol:

Sample preparation
1. Tissue: Lyse the tissue sample by adding an appropriate volume of ice-cold **RIPA/NP-40 Lysis Buffer (containing Protease Inhibitor Cocktail, Phosphatase Inhibitor Cocktail)**, and homogenize the tissue at a low temperature or lyse it by sonication on ice, then incubate on ice for 30 minutes.
2. Adherent cell: Aspirate the culture medium and wash the cells with ice-cold PBS twice. Lyse the cells by adding an appropriate volume of **RIPA/NP-40 Lysis Buffer (containing Protease Inhibitor Cocktail, Phosphatase Inhibitor Cocktail)**, sonicate to lyse the cells, and incubate on ice for 30 minutes.
3. Suspension cell: Transfer the culture medium to a pre-cooled centrifuge tube. Centrifuge and aspirate the supernatant. Wash the cells with ice-cold PBS twice. Lyse the cells by adding an appropriate volume of **RIPA/NP-40 Lysis Buffer (containing Protease Inhibitor Cocktail, Phosphatase Inhibitor Cocktail)**, sonicate to lyse the cells, and incubate on ice for 30 minutes.
4. Place the lysate into a pre-cooled microcentrifuge tube. Centrifuge at 4°C for 15 min. Collect the supernatant;
5. Remove a small volume of lysate to determine the protein concentration;
6. Combine the lysate with protein loading buffer. Boil 20 μL sample under 95-100°C for 5 min. Centrifuge for 5 min after cool down on ice.

Electrophoretic separation
1. According to the concentration of extracted protein, load appropriate amount of protein sample and marker onto SDS-PAGE gels for electrophoresis. Recommended separating gel (lower gel) concentration: 10%. Reference Table for Selecting SDS-PAGE Separation Gel Concentrations
2. Power up 80V for 30 minutes. Then the power supply is adjusted (110 V~150 V), the Marker is observed, and the electrophoresis can be stopped when the indicator band of the predyed protein Marker where the protein is located is properly separated. (Note that the current should not be too large when electrophoresis, too large current (more than 150 mA) will cause the temperature to rise, affecting the result of running glue. If high currents cannot be avoided, an ice bath can be used to cool the bath.)

Transfer membrane
1. Take out the converter, soak the clip and consumables in the pre-cooled converter;
2. Activate PVDF membrane with methanol for 1 min and rinse with transfer buffer;
3. Install it in the order of "black edge of clip - sponge - filter paper - filter paper - glue -PVDF membrane - filter paper - filter paper - sponge - white edge of clip";
4. The protein was electrotransferred to PVDF membrane. (0.45 μm PVDF membrane is recommended) Reference Table for Selecting PVDF Membrane Pore Size Specifications
Recommended conditions for wet transfer: **200 mA, 120 min**.
(Note that the transfer conditions can be adjusted according to the protein size. For high-molecular-weight proteins, a higher current and longer transfer time are recommended. However, ensure that the transfer tank remains at a low temperature to prevent gel melting.)

Block
1. After electrotransfer, wash the film with TBST at room temperature for 5 minutes;
2. Incubate the film in the blocking solution **(recommending 5% BSA solution)** for 1 hour at room temperature;
3. Wash the film with TBST for 3 times, 5 minutes each time.

Antibody incubation
1. Use 5% skim milk powder to prepare the primary antibody working liquid (recommended dilution ratio for primary antibody 1:1000), gently shake and incubate with the film at 4°C overnight;
2. Wash the film with TBST 3 times, 5 minutes each time;
3. Add the secondary antibody to the blocking solution and incubate with the film gently at room temperature for 1 hour;
4. After incubation, wash the film with TBST 3 times for 5 minutes each time.

Antibody staining
1. Add the prepared ECL luminescent substrate (or select other color developing substrate according to the second antibody) and mix evenly;
2. Incubate with the film for 1 minute, remove excess substrate (keep the film moist), wrap with plastic film, and expose in the imaging system. **(Exposure time of at least 120s is recommended)**

References

https://pubmed.ncbi.nlm.nih.gov/28784767/ https://pubmed.ncbi.nlm.nih.gov/29467609/

Application Data

WB

Validated by Capsid Bio



Lane 1: Mouse brain, Lane 2: Mouse brain (λ phosphatase-treated), Lane 3: Mouse brain (KO Tau)