Phospho-Phospholipase Cγ1/PLC-γ-1 (Tyr783) Antibody [J4J15]

Catalog No.C20991 Batch:C2099103

Product Datasheet

Biological Description

Specificity	Phospho-Phospholipase Cγ1/PLC-γ-1 (Tyr783) Antibody [J4J15] detects endogenous levels of total Phospholipase Cγ1/PLC-γ-1 protein only when it is phosphorylated at Tyr783.
Background	Phospho-Phospholipase Cγ1 (Tyr783), the activated form of PLC-γ1, is a pivotal effector in receptor tyrosine kinase (RTK) signaling. Upon RTK stimulation, Tyr783 of PLC-γ1 becomes phosphorylated, typically by kinases such as EGFR, PDGFR, Syk, or Src family members. This phosphorylation event triggers a conformational change, relieving autoinhibition imposed by the split SH2-SH2-SH3 domains that otherwise clamp the catalytic core. The phosphorylated Tyr783 in the SH2 linker binds intramolecularly to the cSH2 domain, displacing it from the C2 core interface and exposing the active site for membrane docking and catalysis. PLC-γ1 features an N-terminal PH domain for PIP2 membrane recruitment, a catalytic TIM barrel (X-Y domains), EF hands and a C2 domain for Ca2+/lipid sensing, and regulatory SH2-SH2-SH3 domains. Once activated, PLC-γ1 hydrolyzes phosphatidylinositol 4,5-bisphosphate (PIP2) into inositol 1,4,5-trisphosphate (IP3) and diacylglycerol (DAG). These second messengers drive intracellular calcium release and protein kinase C (PKC) activation, propagating downstream signaling. The high-affinity cSH2-pTyr783 interaction outcompetes autoinhibitory contacts, stabilizing an open, catalytically active conformation and amplifying IP3/DAG production. This sustains Ca2+ oscillations, PKC/ERK crosstalk, cytoskeletal remodeling, gene expression, and chemotaxis, especially in immune cells. Rapid dephosphorylation of Tyr783 ensures timely signal termination. Phospho-PLCγ1 is indispensable for platelet aggregation, T and B cell activation, and RTK-driven cell proliferation. Aberrant Tyr783 phosphorylation can cause immune disorders (e.g., SCID from gain-of-function mutations), hematologic malignancies via hyperactive PLC signaling, and drive invasion and angiogenesis in solid tumors.

Usage Information

Application	WB, IF	Dilution	WB: 1:100000 - 1:200000; IF: 1:100
Reactivity	Mouse, Human		
Source	Rabbit Monoclonal Antibody	MW	148 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: 5%.** 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 1:100000)**, 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.

IF

Experimental Protocol:

Sample Preparation
1. Adherent Cells: Place a clean, sterile coverslip in a culture dish. Once the cells grow to near confluence as a monolayer, remove the coverslip for further use.
2. Suspension Cells: Seed the cells onto a clean, sterile slide coated with poly-L-lysine.
3. Frozen Sections: Allow the slide to thaw at room temperature. Wash it with pure water or PBS for 2 times, 3 minutes each time.

Experimental Methods

4. Paraffin Sections: Deparaffinization and rehydration. Wash the slide with pure water or PBS for 3 times, 3 minutes each time. Then perform antigen retrieval.

Fixation
1. Fix the cell coverslips/spots or tissue sections at room temperature using a fixative such as 4% paraformaldehyde (4% PFA) for 10-15 minutes.
2. Wash the sample with PBS for 3 times, 3 minutes each time.

Permeabilization
1.Add a detergent such as 0.1–0.3% Triton X-100 to the sample and incubate at room temperature for 10–20 minutes.
(Note: This step is only required for intracellular antigens. For antigens expressed on the cell membrane, this step is unnecessary.)
Wash the sample with PBS for 3 times, 3 minutes each time.

Blocking
Add blocking solution and incubate at room temperature for at least 1 hour. (Common blocking solutions include: serum from the same source as the secondary antibody, BSA, or goat serum.)
Note: Ensure the sample remains moist during and after the blocking step to prevent drying, which can lead to high background.

Immunofluorescence Staining (Day 1)
1. Remove the blocking solution and add the diluted primary antibody.
2. Incubate the sample in a humidified chamber at 4°C overnight.

Immunofluorescence Staining (Day 2)
1. Remove the primary antibody and wash with PBST for 3 times, 5 minutes each time.
2. Add the diluted fluorescent secondary antibody and incubate in the dark at 4°C for 1–2 hours.
3. Remove the secondary antibody and wash with PBST for 3 times, 5 minutes each time.
4. Add diluted DAPI and incubate at room temperature in the dark for 5–10 minutes.
5. Wash with PBST for 3 times, 5 minutes each time.

Mounting
1. Mount the sample with an anti-fade mounting medium.
2. Allow the slide to dry at room temperature overnight in the dark.
3. Store the slide in a slide storage box at 4°C, protected from light.

References

https://pubmed.ncbi.nlm.nih.gov/35367415/ https://pubmed.ncbi.nlm.nih.gov/31889510/

Application Data

IF

Validated by Capsid Bio



Immunofluorescent analysis of Jurkat cells（Pervanadate-treated）, using F3884 (green, 1:100), Hoechst (blue) and tubulin (Red).

WB

Validated by Capsid Bio



Lane 1: Jurkat, Lane 2: Jurkat (pervanadate, 50mM, 5 min), Lane 3: Jurkat (pervanadate, 50mM, 5 min; alkaline phosphatase treated)