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ProductInformation

ANTI-PHOSPHO-JAK1 (pTyr$^{1022/1023}$)
Developed in Rabbit, Affinity Isolated Antibody

Product Number **J 3251**

Product Description

Anti-Phospho-JAK1 (pTyr$^{1022/1023}$) is developed in rabbit using as immunogen a synthetic phosphopeptide derived from a region of JAK1 that contains tyrosine 1022 and 1023. The serum is affinity purified using epitope-specific affinity chromatography. The antibody is preabsorbed to remove any reactivity towards the non-tyrosine phosphorylated JAK1 protein.

Anti-Phospho-JAK1 (pTyr$^{1022/1023}$) recognizes the phosphorylated form of JAK1 protein (130 kDa) that contains a phosphate on tyrosines 1022 and 1023. The antibody does not cross-react with the non-phosphorylated JAK1 protein or any other JAK proteins.

Janus kinases (JAK) are cytoplasmic non-receptor protein tyrosine kinases (PTKs) involved in signal transduction and control of cell survival, proliferation, differentiation and apoptosis.[1,2,3] The members of the JAK family are JAK1, JAK2, JAK3, and TYK2. JAK1, JAK2, and TYK2 are expressed ubiquitously in a variety of cells and tissues. JAK3, on the other hand, is present only in natural killer (NK) cells and natural killer-like cells.[4] JAK1 and JAK2 differ in their responses to interferons. JAK1 is a required regulatory molecule for interferons α and β, while JAK2 is required for signaling of interferon γ, but not IFN α or β.

Since JAKs lack their own receptors, they become activated by coupling to cellular receptors that lack enzymatic activity themselves. These receptors include cytokine receptors (IL-2,- 4, -7, -9, and -15), T cell surface glycoproteins (CD4, CD8), growth factor receptors (GM-CSF), chemokine receptors (CXCR4, CCR5), hormones (growth hormone), and interferon receptors.[5,6,7] Receptor-bound JAKs become activated via phosphorylation at two adjacent tyrosine residues, as well as one or more serine residues. In turn, they create docking sites for the SH2 containing signaling proteins STATs (Signal Transducers and Regulators of Transcription). STATs translocate to the nucleus, where they modify transcription of numerous genes. JAKs integrate components of diverse signaling cascades, including Src-kinase cascade, RAS-MAP kinase pathway, and the PI3K-AKT pathway.

The PTK activity is located in the C-terminal PTK-like domain. JAKs have a second phosphotransferase-related domain immediately N-terminal to the PTK domain; the role of this second domain is unknown.

Phosphorylation of JAKs occurs at site-specific tyrosine residues. Phosphorylation of tyrosine residues 1022 and 1023 is necessary for the activation of catalytic events in JAK 1. Tyrosine 1007 and 1008 are autophosphorylation sites, and their phosphorylation is critical for JAK 2 kinase activity.[8]

The negative regulation of Janus kinases has implication in many pathological conditions, including immunodeficiency, cardiac ischemia and carcinomas. This regulation occurs as a result of selective inhibition of cytokine-JAK-STAT pathways by such specific inhibitors as SOCS-1 (suppressor of cytokine signaling), phosphatase SHP-1, PIAS (protein inhibitor of activated STATs) and JAB/SOCS-1.[9,10]

Reagent

Anti-Phospho-JAK 1 (pTyr$^{1022/1023}$) is supplied at approximately 0.5 mg/ml in 100 µl of phosphate buffered saline, pH 7.3, with 1 mg/ml of bovine serum albumin and 0.05% sodium azide as a preservative.

Storage/Stability

Store at –70 °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.

Precautions and Disclaimer

Due to the sodium azide content, a material safety data sheet (MSDS) for this product has been sent to the attention of the safety officer of your institution. Consult the MSDS for information regarding hazards and safe handling practices.

Product Profile

The recommended working concentration of 0.1 to 0.5 µg/ml is determined by immunoblotting using mouse serum-deprived 3T3-L1 cells treated with LIF or extract from human A431 carcinoma cells. Data

demonstrate that only phosphopeptide corresponding to the region containing tyrosine 1022/1023 blocks the antibody signal, which confirms the specificity of the Anti-Phospho-JAK2 (pTyr$^{1022/1023}$) for these phoshosphorylated residues.
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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