# JAK2 protein

**Catalog#: AD0056 | Size: 30μL/50μL/100μL**

## Main Information

| Reactivity | Application |
|---|---|
| Human | WB, SDS-PAGE |

## Detailed Information

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| Recommeded Dilution Ratio | WB 1:500-2000 |
| Formulation | Liquid in PBS |
| Source | E.coli |
| Purity | SDS-PAGE >90% |
| Storage | -20°C/6 month,-80°C for long storage |

## Antigen&Target Information

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| Sequence | Amino acid: 121-361, with his-MBP tag. |
| Gene Name | JAK2 |
| Protein Name | JAK2 protein |
| Other Name | Tyrosine-protein kinase JAK2 ;Janus kinase 2 ;JAK-2 |

## Database Link

| Organism | Gene ID | SwissProt |
|---|---|---|
| Human | 3717 | P60674 |
| Mouse | | P62120 |

## Background

Catalytic activity:ATP + a [protein]-L-tyrosine = ADP + a [protein]-L-tyrosine phosphate.,disease:Chromosomal aberrations involving JAK2 are found in both chronic and acute forms of eosinophilic, lymphoblastic and myeloid leukemia. Translocation t(8;9)(p22;p24) with PCM1 links the protein kinase domain of JAK2 to the major portion of PCM1. Translocation t(9;12)(p24;p13) with ETV6.,disease:Defects in JAK2 are a cause of acute myelogenous leukemia (AML) [MIM:601626]. AML is a malignant disease in which hematopoietic precursors are arrested in an early stage of development.,disease:Defects in JAK2 are a cause of susceptibility to Budd-Chiari syndrome [MIM:600880]. Budd-Chiari syndrome is a spectrum of disease states, including anatomic abnormalities and hypercoagulable disorders, resulting in hepatic venous outflow occlusion. Clinical manifestations observed in the majority of patients include hepatomegaly, right upper quadrant pain, and abdominal ascites.,disease:Defects in JAK2 are associated with familial myelofibrosis [MIM:254450]. Myelofibrosis with myeloid metaplasia is a myeloproliferative disease with annual incidence of 0.5-1.5 cases per 100,000 individuals and age at diagnosis around 60 (an increased prevalence is noted in Ashkenazi Jews). Clinical manifestations depend on the type of blood cell affected and may include anemia, pallor, splenomegaly, hypermetabolic state, petechiae, ecchymosis, bleeding, lymphadenopathy, hepatomegaly, portal hypertension.,disease:Defects in JAK2 are associated with polycythemia vera (PV) [MIM:263300]. PV, the most common form of primary polycythemia, is caused by somatic mutation in a single hematopoietic stem cell leading to clonal hematopoiesis. PV is a myeloproliferative disorder characterized predominantly by erythroid hyperplasia, but also by myeloid leukocytosis, thrombocytosis, and splenomegaly. Familial cases of PV are very rare and usually manifest in elderly patients.,disease:Defects in JAK2 gene may be a cause of essential thrombocythemia (ET) [MIM:187950]. ET is characterized by elevated platelet levels due to sustained proliferation of megakaryocytes, and frequently lead to thrombotic and haemorrhagic complications.,domain:Possesses two phosphotransferase domains. The second one probably contains the catalytic domain (By similarity), while the presence of slight differences suggest a different role for domain 1.,function:Plays a role in leptin signaling and control of body weight (By similarity). Tyrosine kinase of the non-receptor type, involved in interleukin-3 and probably interleukin-23 signal transduction.,PTM:Leptin promotes phosphorylation on tyrosine residues, including phosphorylation on Tyr-813.,similarity:Belongs to the protein kinase superfamily. Tyr protein kinase family.,similarity:Belongs to the protein kinase superfamily. Tyr protein kinase family. JAK subfamily.,similarity:Contains 1 FERM domain.,similarity:Contains 1 protein kinase domain.,similarity:Contains 1 SH2 domain.,subcellular location:Wholly intracellular, possibly membrane associated.,subunit:Interacts with SIRPA and SH2B1 (By similarity). Interacts with IL23R, SKB1 and STAM2.,tissue specificity:Expressed in blood, bone marrow and lymph node.

## Function

Protein import into nucleus, translocation, MAPKKK cascade, activation of MAPKK activity, cell morphogenesis, cell morphogenesis involved in differentiation, regulation of cytokine production, positive regulation of cytokine production,regulation of protein amino acid phosphorylation, positive regulation of protein amino acid phosphorylation, immune system development, regulation of peptide secretion, positive regulation of peptide secretion, protein amino acid phosphorylation, protein targeting, protein import into nucleus, phosphorus metabolic process, phosphate metabolic process, cellular ion homeostasis, cellular calcium ion homeostasis, cellular metal ion homeostasis, intracellular protein transport, nucleocytoplasmic transport, apoptosis, induction of apoptosis, cell motion, response to oxidative stress,negative regulation of cell adhesion, cell surface receptor linked signal transduction, enzyme linked receptor protein signaling pathway, transmembrane receptor protein tyrosine kinase signaling pathway, G-protein coupled receptor protein signaling pathway, elevation of cytosolic calcium ion concentration, intracellular signaling cascade, protein kinase cascade, JAK-STAT cascade, tyrosine phosphorylation of STAT protein, STAT protein nuclear translocation,axonogenesis, mesoderm development, regulation of heart contraction, protein localization, cell death, positive regulation of cell proliferation, negative regulation of cell proliferation, induction of apoptosis by intracellular signals,induction of apoptosis by oxidative stress, response to wounding, response to endogenous stimulus, response to hormone stimulus, hormone-mediated signaling, positive regulation of biosynthetic process, positive regulation of signal transduction, response to organic substance, positive regulation of phosphorus metabolic process, positive regulation of macromolecule metabolic process, regulation of protein kinase cascade, positive regulation of cell communication, positive regulation of protein kinase cascade, regulation of phosphatase activity, positive regulation of phosphatase activity, regulation of cell death, positive regulation of cell death, programmed cell death, induction of programmed cell death, regulation of phosphoinositide 3-kinase cascade, positive regulation of phosphoinositide 3-kinase cascade, protein transport, death, phosphorylation, protein import, peptidyl-tyrosine phosphorylation, peptidyl-tyrosine modification, regulation of phosphate metabolic process, cellular homeostasis, regulation of cell-cell adhesion,negative regulation of cell-cell adhesion, cellular cation homeostasis, cellular di-, tri-valent inorganic cation homeostasis, cell projection organization, hemopoiesis, myeloid cell differentiation, regulation of cell adhesion, neuron differentiation, regulation of cell migration, positive regulation of cell migration, steroid hormone receptor signaling pathway, intracellular receptor-mediated signaling pathway, regeneration, neuron projection regeneration, axon regeneration, neuron projection development,

positive regulation of cellular biosynthetic process, positive regulation of defense response, regulation of protein modification process, positive regulation of protein modification process,corticosteroid receptor signaling pathway, mineralocorticoid receptor signaling pathway, positive regulation of insulin secretion, regulation of response to external stimulus, positive regulation of response to external stimulus, activation of protein kinase activity, regulation of cellular protein metabolic process, positive regulation of cellular protein metabolic process, regulation of intracellular transport, positive regulation of intracellular transport, positive regulation of phosphoprotein phosphatase activity, regulation of interleukin-1 beta production, regulation of interleukin-1 production, positive regulation of interleukin-1 beta production, positive regulation of interleukin-1 production, cellular response to hormone stimulus, regulation of protein localization, cellular component morphogenesis, cell part morphogenesis, regulation of intracellular protein transport, regulation of protein import into nucleus, translocation,positive regulation of protein import into nucleus, translocation, response to hydroperoxide, protein localization in organelle, cellular response to stress, positive regulation of kinase activity, protein localization in nucleus, cellular protein localization, regulation of dephosphorylation, regulation of locomotion, positive regulation of locomotion,regulation of cell proliferation, regulation of protein import into nucleus, regulation of phosphorylation, positive regulation of phosphorylation, tyrosine phosphorylation of Stat1 protein, regulation of tyrosine phosphorylation of STAT protein, regulation of tyrosine phosphorylation of Stat3 protein, positive regulation of tyrosine phosphorylation of Stat3 protein, regulation of tyrosine phosphorylation of Stat5 protein, positive regulation of tyrosine phosphorylation of Stat5 protein, positive regulation of tyrosine phosphorylation of STAT protein, homeostatic process,regulation of apoptosis, positive regulation of apoptosis, regulation of programmed cell death, positive regulation of programmed cell death, positive regulation of catalytic activity, positive regulation of DNA binding, negative regulation of DNA binding, response to peptide hormone stimulus, regulation of neuron apoptosis, neuroprotection, regulation of kinase activity, regulation of phosphoprotein phosphatase activity, regulation of system process, negative regulation of molecular function, positive regulation of molecular function, establishment of protein localization, regulation of nitric oxide biosynthetic process, positive regulation of nitric oxide biosynthetic process, regulation of transcription, positive regulation of cell differentiation, negative regulation of heart contraction, regulation of protein kinase activity, positive regulation of protein kinase activity, positive regulation of phosphate metabolic process, regulation of JAK-STAT cascade, positive regulation of JAK-STAT cascade, response to antibiotic, protein amino acid autophosphorylation,regulation of nucleocytoplasmic transport, regulation of hormone secretion, positive regulation of hormone secretion,intracellular transport, platelet-derived growth factor receptor signaling pathway, hemopoietic or lymphoid organ development, positive regulation of response to stimulus, neuron development, cell morphogenesis involved in neuron differentiation, response to axon injury, neuron projection morphogenesis, cell projection morphogenesis, chemical homeostasis, regulation of inflammatory response, positive regulation of inflammatory response, regulation of peptidyl-tyrosine phosphorylation, positive regulation of peptidyl-tyrosine phosphorylation, regulation of insulin secretion, ion homeostasis, regulation of cell activation, positive regulation of cell activation, regulation of lipoprotein lipase activity, regulation of secretion, positive regulation of secretion, positive regulation of transport, regulation of transcription factor activity, positive regulation of transcription factor activity, positive regulation of developmental process, regulation of binding, positive regulation of binding, negative regulation of binding, regulation of DNA binding,nuclear transport, nuclear import, positive regulation of nitrogen compound metabolic process, regulation of phosphorus metabolic process, positive regulation of protein transport, regulation of protein transport, positive regulation of multicellular organismal process, negative regulation of multicellular organismal process, positive regulation of protein metabolic process, regulation of cell motion, positive regulation of cell motion, regulation of hydrolase activity, regulation of transferase activity, positive regulation of hydrolase activity, positive regulation of transferase activity, cytosolic calcium ion homeostasis, metal ion homeostasis, di-, tri-valent inorganic cation homeostasis, calcium ion homeostasis, cation homeostasis, cellular chemical homeostasis, regulation of lipase activity,regulation of cellular localization, growth hormone receptor signaling pathway, JAK-STAT cascade involved in growth hormone signaling pathway, regulation of growth hormone receptor signaling pathway, positive regulation of growth hormone receptor signaling pathway, response to growth hormone stimulus, regulation of establishment of protein localization, cellular macromolecule localization.

## Cellular Localization

Endomembrane system ; Peripheral membrane protein. Cytoplasm. Nucleus.

## Tissue Expression

Ubiquitously expressed throughout most tissues.

## Signaling Pathway

Cellular Processes >> Cell growth and death >> Necroptosis
Cellular Processes >> Cellular community - eukaryotes >> Signaling pathways regulating pluripotency of stem cells
Organismal Systems >> Immune system >> Th1 and Th2 cell differentiation
Organismal Systems >> Immune system >> Th17 cell differentiation
Organismal Systems >> Immune system >> Chemokine signaling pathway
Organismal Systems >> Endocrine system >> Adipocytokine signaling pathway
Organismal Systems >> Endocrine system >> Prolactin signaling pathway
Organismal Systems >> Endocrine system >> Growth hormone synthesis, secretion and action
Organismal Systems >> Nervous system >> Cholinergic synapse
Human Diseases >> Cancer: overview >> Pathways in cancer
Human Diseases >> Cancer: overview >> PD-L1 expression and PD-1 checkpoint pathway in cancer
Environmental Information Processing >> Signal transduction >> JAK-STAT signaling pathway
Environmental Information Processing >> Signal transduction >> PI3K-Akt signaling pathway

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