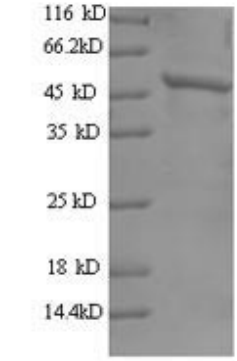
Recombinant Human Tyrosine-protein kinase JAK2 (JAK2), partial

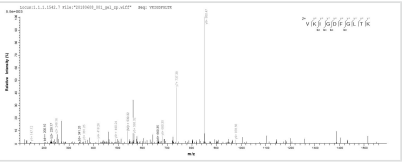
Product Code	CSB-EP011931HU
Relevance	Non-receptor tyrosine kinase involved in various processes such as cell growth, development, differentiation or histone modifications. Mediates essential signaling events in both innate and adaptive immunity. In the cytoplasm, plays a pivotal role in signal transduction via its association with type I receptors such as growth hormone (GHR), prolactin (PRLR), leptin (LEPR), erythropoietin (EPOR), thrombopoietin (THPO); or type II receptors including IFN-alpha, IFN-beta, IFN-gamma and multiple interleukins. Following ligand-binding to cell surface receptors, phosphorylates specific tyrosine residues on the Cytoplasmic domain tails of the receptor, creating docking sites for STATs proteins. Subsequently, phosphorylates the STATs proteins once they are recruited to the receptor. Phosphorylated STATs then form homodimer or heterodimers and translocate to the nucleus to activate gene transcription. For example, cell stimulation with erythropoietin (EPO) during erythropoiesis leads to JAK2 autophosphorylation, activation, and its association with erythropoietin receptor (EPOR) that becomes phosphorylated in its Cytoplasmic domain. Then, STAT5 (STAT5A or STAT5B) is recruited, phosphorylated and activated by JAK2. Once activated, dimerized STAT5 translocates into the nucleus and promotes the transcription of several essential genes involved in the modulation of erythropoiesis. In addition, JAK2 mediates angiotensin-2-induced ARHGEF1 phosphorylation. Plays a role in cell cycle by phosphorylating CDKN1B. Cooperates with TEC through reciprocal phosphorylation to mediate cytokine-driven activation of FOS transcription. In the nucleus, plays a key role in chromatin by specifically mediating phosphorylation of 'Tyr-41' of histone H3 (H3Y41ph), a specific tag that promotes exclusion of CBX5 (HP1 alpha) from chromatin.
Abbreviation	Recombinant Human JAK2 protein, partial
Storage	The shelf life is related to many factors, storage state, buffer ingredients, storage temperature and the stability of the protein itself. Generally, the shelf life of liquid form is 6 months at -20°C/-80°C. The shelf life of lyophilized form is 12 months at -20°C/-80°C.
Uniprot No.	O60674
Alias	Janus kinase 2 ;JAK-2
Product Type	Recombinant Protein
Immunogen Species	Homo sapiens (Human)
Purity	Greater than 90% as determined by SDS-PAGE.
Sequence	KPLSALDSQRKLQFYEDRHQLPAPKWAELANLINNCMDYEPDFRPSFRAIIRDL NSLFTPDYELLTENDMLPNMRIGALGFSGAFEDRDPTQFEERHLKFLQQLGKG NFGSVEMCRYDPLQDNTGEVVAVKKLQHSTEEHLRDFEREIEILKSLQHDNIVK YKGVCYSAGRRNLKLIMEYLPYGSLRDYLQKHKERIDHIKLLQYTSQICKGMEY LGTKRYIHRDLATRNILVENENRVKIGDFGLTKVLPQDKEYYKVKEPGESPIFW

	YAPESLTESKFSVASDVWSFGVVLYELFTYIEKSKSPPAEFMRMIGNDKQGQM IVFHLIELLKNNGRLPRPDGCPDEIYMIMTECWNNNVNQRPSFRDLALRVDQIR DNMAG
Research Area	Immunology
Source	E.coli
Target Names	JAK2
Expression Region	752-1132aa
Notes	Repeated freezing and thawing is not recommended. Store working aliquots at 4°C for up to one week.
Tag Info	N-terminal 6xHis-tagged
Mol. Weight	48.6kDa
Protein Length	Partial

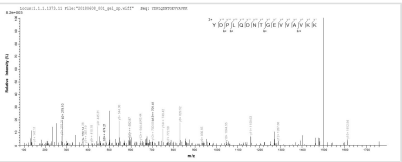
Image



(Tris-Glycine gel) Discontinuous SDS-PAGE (reduced) with 5% enrichment gel and 15% separation gel.



Based on the SEQUEST from database of E.coli host and target protein, the LC-MS/MS Analysis result of CSB-EP011931HU could indicate that this peptide derived from E.coli-expressed Homo sapiens (Human) JAK2.



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Description

The production of recombinant human JAK2 protein, featuring a 6xHis tag at the N-terminus, begins with cloning the JAK2 gene fragment (752-1132aa) into an expression vector. The N-terminal 6xHis tag gene is also co-inserted into the vector at the suitable site. After the transformation of the recombinant vector into competent E. coli cells, IPTG is used to induce high-level expression of the target protein. Following cell lysis, the JAK2 protein is purified via affinity chromatography. The purification process is followed by SDS-PAGE analysis, which consistently demonstrates a purity of over 90% of the recombinant JAK2 protein.

Human Tyrosine-protein kinase JAK2, a member of the Janus kinase family, plays a pivotal role in various cellular processes, particularly in hematopoiesis and immune response. Discovered in 1992, JAK2 is essential for signaling pathways initiated by several cytokines, including erythropoietin and thrombopoietin, which are crucial for red blood cell and platelet production, respectively [1][2]. JAK2 facilitates the phosphorylation of STAT proteins, thereby propagating signals from the cell surface to the nucleus, which is vital for gene expression regulation [1][2].

In addition to its role in hematopoiesis, JAK2 is implicated in various cancers, where its signaling pathways can promote cell survival and proliferation. Studies have shown that JAK2 interacts with oncogenic proteins like Bcr-Abl, enhancing the survival of leukemic cells [3][4]. Its mutations and aberrant activation are central to the pathogenesis of several hematological disorders, making it a key target for therapeutic intervention.

References:
[1] J. Ihle and D. Gilliland, Jak2: normal function and role in hematopoietic disorders, Current Opinion in Genetics & Development, vol. 17, no. 1, p. 8-14, 2007. https://doi.org/10.1016/j.gde.2006.12.009
[2] S. Verstovsek, Therapeutic potential of jak2 inhibitors, The Journal of Oncopathology, vol. 1, no. 1, p. 76-79, 2013. https://doi.org/10.13032/tjop.2052-5931.100024
[3] A. Samanta, S. Chakraborty, Y. Wang, E. Schlette, E. Reddy, & R. Arlinghaus, Destabilization of bcr-abl/jak2 network by a jak2/abl kinase inhibitor on044580 overcomes drug resistance in blast crisis chronic myelogenous leukemia (cml), Genes & Cancer, vol. 1, no. 4, p. 346-359, 2010. https://doi.org/10.1177/1947601910372232
[4] S. Chakraborty, X. Leng, B. Perazzona, X. Sun, Y. Lin, & R. Arlinghaus, Combination of jak2 and hsp90 inhibitors: an effective therapeutic option in drug-resistant chronic myelogenous leukemia, Genes & Cancer, vol. 7, no. 5-6, p. 201-208, 2016. https://doi.org/10.18632/genesandcancer.111

Reconstitution	We recommend that this vial be briefly centrifuged prior to opening to bring the contents to the bottom. Please reconstitute protein in deionized sterile water to a concentration of 0.1-1.0 mg/mL.We recommend to add 5-50% of glycerol (final concentration) and aliquot for long-term storage at -20°C/-80°C. Our default final concentration of glycerol is 50%. Customers could use it as reference.
Shelf Life	The shelf life is related to many factors, storage state, buffer ingredients, storage temperature and the stability of the protein itself. Generally, the shelf life of liquid form is 6 months at -20°C/-80°C. The shelf life of lyophilized form is 12 months at -20°C/-80°C.