PRODUCT INFORMATION

JAK3 JH2 Domain (human, recombinant; aa 511-790) - Biotinylated

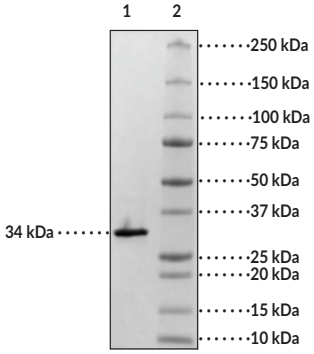
Item No. 42276

Overview and Properties

Synonyms:	Janus-associated Kinase 3, Leukocyte Janus Kinase, L-JAK, Tyrosine-protein Kinase JAK3
Source:	Active recombinant human C-terminal AVI- and His-tagged JAK3 JH2 domain expressed in insect cells (*sf*9)
Amino Acids:	511-790
Uniprot No.:	P52333
Molecular Weight:	34 kDa
Storage:	-80°C (as supplied)
Stability:	≥6 months
Purity:	≥90% estimated by SDS-PAGE
Supplied in:	40 mM Tris-HCl, pH 8.0, with 110 mM sodium chloride, 2.2 mM potassium chloride, 20% glycerol, and 3 mM DTT
Protein Concentration:	***batch specific*** mg/ml
Bioactivity:	See figures for details

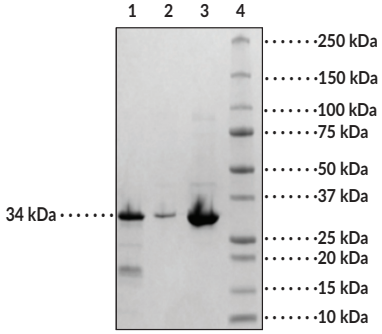
Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Images



Lane 1: JAK3 JH2 Domain
Lane 2: MW Markers

SDS-PAGE Analysis of JAK3 JH2 Domain.



Lane 1: Beads
Lane 2: Flow Through
Lane 3: Positive Control (JAK3 JH2 Domain)
Lane 4: MW Markers

Biotin-Advin pull down SDS-PAGE Analysis of JAK3 JH2 Domain.

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Description

JAK3 is a non-receptor tyrosine kinase that has roles in cytokine signaling and immune cell function.[1,2] It is composed of N-terminal FERM and SH2 domains, an autoinhibitory JH2 pseudokinase domain, and a C-terminal kinase domain.[2-4] JAK3 is constitutively expressed in natural killer (NK) cells and thymocytes and expressed upon cell activation in T cells, B cells, and monocytes.[5] Following cytokine binding to the IL-2 receptor (IL-2R), IL-4R, IL-7R, IL-9R, IL-15R, or IL-21R, JAK3 binds to the γ_c subunit of the receptor and induces heterodimerization of the receptor subunits and activation of STAT transcription factors.[1,2,5] Through activation of these receptors, JAK3-mediated signaling is involved in T cell proliferation, differentiation, and survival, B cell differentiation and function, and macrophage activation, among other activities.[1,2] Loss-of-function mutations in *JAK3* are associated with autosomal recessive severe combined immunodeficiency disease (SCID), while gain-of-function mutations are associated with immune dysregulation and blood cancers, including myeloproliferative neoplasms, T cell lymphomas and leukemias, NK lymphoma-leukemia, and acute lymphoblastic leukemia.[2,6,7] Cayman's JAK3 JH2 Domain (human, recombinant; aa 511-790) – Biotinylated protein can be used for avidin-binding assays and has a calculated molecular weight of 34 kDa.

References

1. Benczik, M., and Gaffen, S.L. The interleukin (IL)-2 family cytokines: Survival and proliferation signaling pathways in T lymphocytes. *Immunol. Invest.* **33(2),** 109-142 (2004).
2. Liongue, C., Ratnayake, T., Basheer, F., *et al.* Janus kinase 3 (JAK3): A critical conserved node in immunity disrupted in immune cell cancer and immunodeficiency. *Int. J. Mol. Sci.* **25(5),** 2977 (2024).
3. Leonard, W.J., and O'Shea, J.J. Jaks and STATs: Biological implications. *Annu. Rev. Immunol.* **16,** 293-322 (1998).
4. Shanarinen, P., and Silvennoinen, O. The pseudokinase domain is required for suppression of basal activity of Jak2 and Jak3 tyrosine kinases and for cytokine-inducible activation of signal. *J. Biol. Chem.* **277(49),** 47954-47963 (2002).
5. Notarangelo, L.D., and Candotti, F. *JAK3*-deficient severe combined immunodeficiency. *Radiol. Clin. North Am.* **20(1),** 97-111 (2000).
6. Ott, N., Faletti, L., Heeg, M., *et al.* JAKs and STATs from a clinical perspective: Loss-of-function mutations, gain-of-function mutations, and their multidimensional consequences. *J. Clin. Immunol.* **43(6),** 1326-1359 (2023).
7. Philips, R.L., Wang, Y., Cheon, H., *et al.* The JAK-STAT pathway at 30: Much learned, much more to do. *Cell* **185(21),** 3857-3876 (2022).

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