

PRODUCT INFORMATION



JAK3 Kinase Domain (human, recombinant)

Item No. 42275

Overview and Properties

Synonyms: Janus-Associated Kinase 3, Leukocyte Janus Kinase, L-JAK, Tyrosine-protein Kinase JAK3

Source: Active recombinant human N-terminal His-tagged JAK3 kinase domain expressed in insect cells (sf9)

Amino Acids: 811-1,124

Uniprot No.: P52333

Molecular Weight: 37 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, 3 mM DTT, 20% glycerol, and 200 mM imidazole

Protein

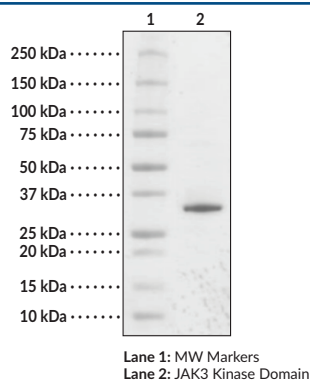
Concentration: *batch specific* mg/ml

Activity: *batch specific* U/ml

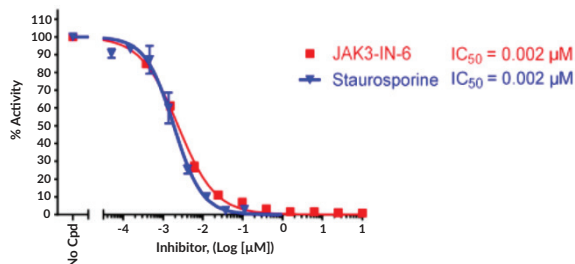
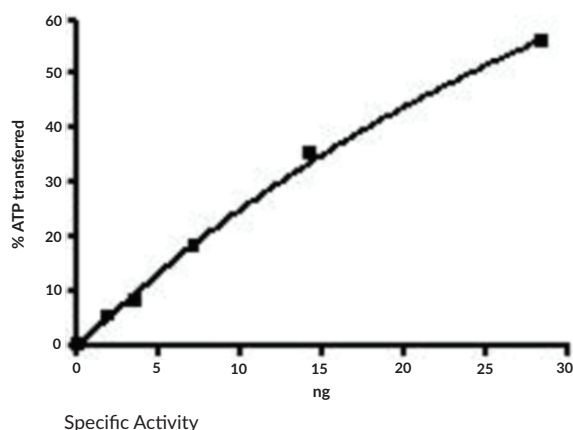
Specific Activity: *batch specific* U/mg

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

Images



SDS-PAGE Analysis of JAK3 Kinase Domain.
This protein has a calculated molecular weight of 37kDa.



Inhibition of JAK3 Kinase Domain activity by the inhibitors JAK-IN-6 and staurosporine was measured with Chemi-Verse™ JAK3 Kinase Assay Kit. Representative data only; not all lots have been tested.

WARNING
THIS PRODUCT IS FOR RESEARCH ONLY - NOT FOR HUMAN OR VETERINARY DIAGNOSTIC OR THERAPEUTIC USE.

SAFETY DATA
This material should be considered hazardous until further information becomes available. Do not ingest, inhale, get in eyes, on skin, or on clothing. Wash thoroughly after handling. Before use, the user must review the [complete](#) Safety Data Sheet, which has been sent via email to your institution.

WARRANTY AND LIMITATION OF REMEDY
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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, a regulatory JH2 pseudokinase domain, and a C-terminal kinase domain.^{2,3} JAK3 is constitutively expressed in natural killer (NK) cells and thymocytes and expressed upon cell activation in T cells, B cells, and monocytes.⁴ 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.^{1,2,4} 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.^{1,5,6} Cayman's JAK3 Kinase Domain (human, recombinant) protein can be used for enzyme activity assays. This protein has a calculated molecular weight of 37 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. Notarangelo, L.D. and Candotti, F. JAK3-deficient severe combined immunodeficiency. *Radiol. Clin. North Am.* **20**(1), 97-111 (2000).
5. 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).
6. 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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