

BACKGROUND

JAKs (or Janus kinases) are a family of tyrosine kinases that associated with receptors of interferons and type I cytokines. Upon receptor activation JAKs phosphorylate and thereby activate the transcription factors known as STATs, and initiate the JAK-STAT signaling pathway. Before activation, STAT proteins are cytosolic proteins; after activation, however, they are translocated to the nucleus where they function as transcription factors. Four JAK family members have been identified (JAK1, JAK2, JAK3 and Tyk2), which share a similar protein domain structure: a kinase domain, a regulatory pseudo-kinase domain, a SH2 domain and a FERM domain. The FERM domain of JAK family members mediates the association of JAK with other enzymes and cytokine receptors. Of these, Jak1 and -2 and Tyk2 are ubiquitously expressed, while Jak3 is found predominantly in immune and hematopoietic tissues. The JAK Tyk2 associates with the IFN- γ , IL-6, 10, 12, and 23 cytokine receptor families. JAK1 mediates signals from IFN- α , beta, gamma and IL-2, 6 receptors. JAK2 transduces signals from the single chain and IL-3 cytokine receptor families, and from the IFN- γ receptors. JAK3 associates with the IL-2 receptor gamma-chain.¹

Jak3 is a cytoplasmic tyrosine kinase that associates with the common chain of the interleukin-2 (IL-2) receptor and is involved in the function of the receptors for IL-2, IL-4, IL-7, IL-9, and IL-15. Jak3 Phosphorylates STAT6, IRS1, IRS2 and PI3K. Mice deficient in Jak3 have few T and B cells, and no natural killer cells. The myeloid lineages in these mice are also affected by the loss of Jak3.² Mutations in Jak3 gene are associated with autosomal SCID (severe combined immunodeficiency disease).³ Many of the lymphoid defects of Jak3-deficient mice can be accounted for by the lack of IL-7R and IL-2R signaling; however, other cytokine systems must also be involved in maintaining peripheral lymphocyte homeostasis. On the other hand, due to its central role in lymphocyte activation, proliferation and homeostasis, targeting the JAK/signal transducer and activator of transcription (STAT) pathway may provide the required efficacy, without the toxicities associated with current therapies. Several studies conducted in rodents have validated the proof-of-concept, with a variety of JAK3 inhibitors demonstrating efficacy for immune suppression.⁴

References:

1. Verma, A. et al: Cancer Metastas. Rev. 22:423-34, 2004
2. Grossman, W.J. et al: Blood 94:932-9, 1999
3. Pesu, M. et al: Immunol. Rev. 203:127-142, 2005
4. Borie, D.C. et al: Curr Opin Investig Drugs 4:1297-303, 2003

TECHNICAL INFORMATION

Source:

Jak3 Antibody is a mouse monoclonal antibody raised against purified recombinant human Jak3 fragments expressed in *E. coli*.

Specificity and Sensitivity:

This antibody detects endogenous Jak3 proteins without cross-reactivity with other family members.

Storage Buffer: PBS and 30% glycerol

Storage:

Store at -20°C for at least one year. Store at 4°C for frequent use. Avoid repeated freeze-thaw cycles.

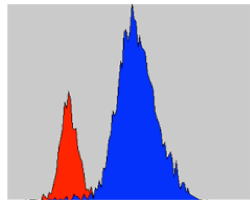
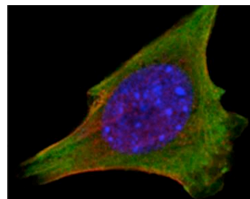
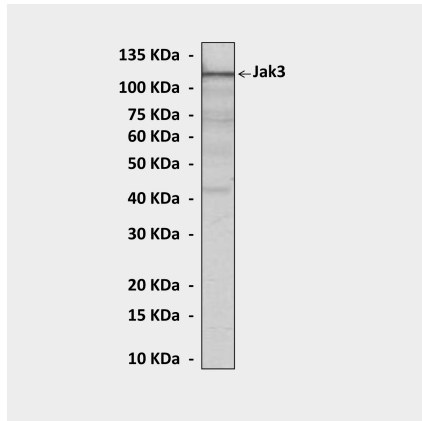
APPLICATIONS

Application:	*Dilution:
WB	1:1,000-10,000
IP	1:50
IHC	n/d
ICC	1:250-500
FACS	n/d

**Optimal dilutions must be determined by end user.*



QUALITY CONTROL DATA



Top: Western Blot detection of Jak3 proteins in Jurkat and cell lysate using Jak3 Antibody. **Middle:** This antibody stains 3T3-L1 cells in confocal immunofluorescent analysis (Jak3 antibody: Green, Actin filament: Red; DRAQ5 DNA dye: Blue). **Bottom:** Jak3 antibody (Blue) also specifically reacts with Jak3 proteins in HeLa cells vs. normal mouse IgG control (Red).

