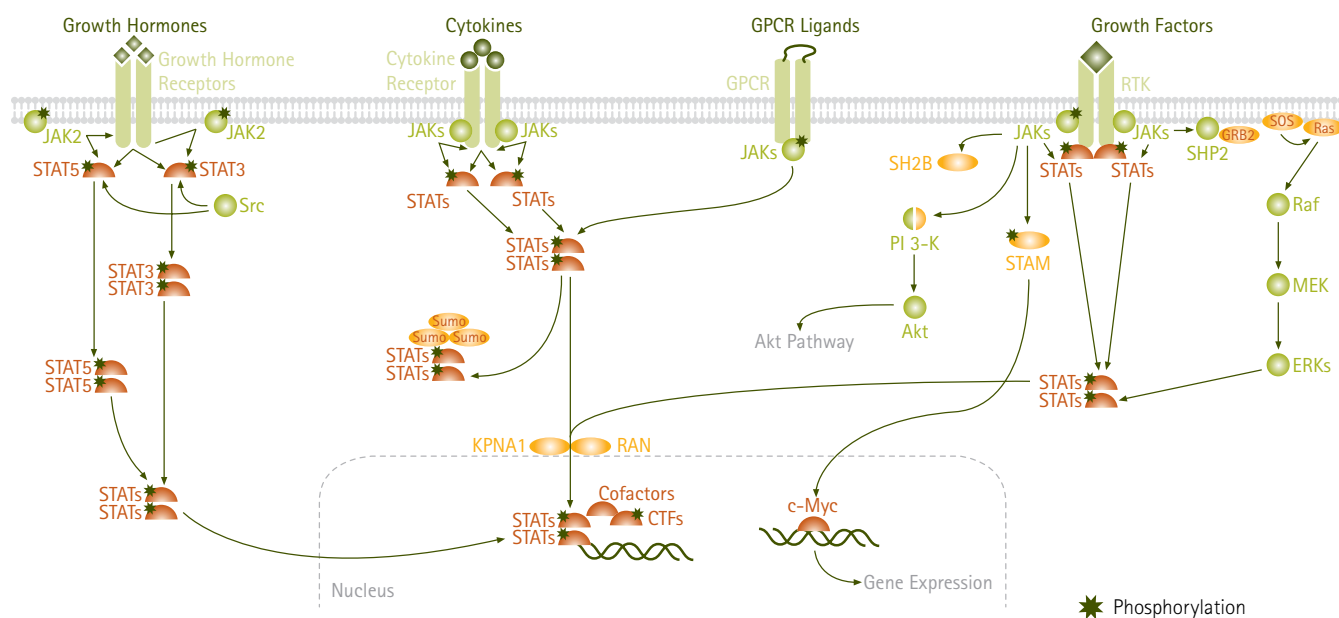


# Pathways and Biomarkers of JAK/STAT Signaling

The Janus kinase (JAK)/signal transducers and activators of transcription (STAT) signaling pathway plays an important role in cell proliferation, cell differentiation, cell migration, and cell death. It is the principal signaling mechanism for a variety of cytokines and growth factors. Constitutive activation or dysregulation of JAK/STAT signaling can result in inflammatory disease, erythrocytosis, gigantism, and leukemia.

In the JAK/STAT signaling scheme, ligand binding to cytokine receptors induces dimerization of their receptor subunits. Following ligand binding, the cytoplasmic domains of two receptor subunits associate with JAK tyrosine kinases. The activated JAKs can then phosphorylate STATs. In the nucleus, dimerized STATs bind to specific regulatory sequences to activate or repress transcription of target genes.



## Selected Antibodies for JAK/STAT Signaling Research

Description	Species Reactivity*	Applications**	Qty/Pk	Catalogue No.
Anti-JAK1	H, Ht, M, R, Rb	IP, WB	150 µL	06-272
Anti-JAK1, clone 73	H, M, R, Ca, Xn, Ch	IF, IP, WB	100 µg	05-1154
Anti-JAK2	H, M, R	IP, WB	100 µg	06-1310
Anti-phospho JAK2 (Tyr570)	H, R, Eq, Chp, Pm, Po	WB	100 µg	09-241
Anti-phospho JAK2 (Tyr813)	H, M, R, Eq, Chp, Po	WB	100 µg	09-242
Anti-phospho-JAK2 (Tyr1007/Tyr1008), clone E132	H, M, R	ICC, IH(P), IP, WB	100 µL	04-1098
Anti-JAK3	H, M	IH(P), IP, WB	100 µL	07-1488
Anti-JAK3, clone HL423	H, M	Mplex, WB	200 µL	04-011
Anti-STAT1	H	WB	100 µL	04-069
Anti-Phospho-STAT1 (Tyr701), clone 5C9.2	H, M, R	WB	100 µg	05-1064
Anti-STAT2, CT	H, M	ICC, EMSA, IP, WB	200 µg	06-502
Anti-phospho-STAT2 (Tyr689)	H, M	IP, WB	100 µL	ABE541
Anti-STAT3	H, M, R, B, Po, Pm	IP, WB	100 µg	07-2173
Anti-STAT3, phospho (Ser727), clone 6E4	H, M	ICC, IH(P), IP, WB	100 µL	MAB3705
Anti-STAT5A	H, M, R	IP, WB	100 µL	06-968
Anti-phospho-STAT5A/B (Tyr694/699)	B, H, M, R	DB, WB	100 µL	07-586
Anti-STAT6	H	WB	100 µg	07-914
Anti-phospho-STAT6 (Tyr641), clone 16E12	H, M, R	WB	100 µg	05-590

## Selected Inhibitors of JAK/STAT Signaling

Description	Comments	Size	Catalogue No.
JAK Inhibitor I (Pyridone 6)	A cell-permeable, reversible, ATP-competitive inhibitor of JAK1 (IC <sub>50</sub> = 15 nM for murine JAK1), JAK2 (IC <sub>50</sub> = 1 nM), JAK3 (Ki = 5 nM), and Tyk2 (IC <sub>50</sub> = 1 nM).	500 µg 1 mg	420099
JAK2 Inhibitor IV 3-Amino-5-(N-tert-butyl-sulfonamido-4-phenyl)-indazole	A potent inhibitor of both the wild-type JAK2 and the constitutively active V617F mutant (IC <sub>50</sub> = 78 and 206 nM, respectively).	5 mg	420139
JAK3 Inhibitor VI	A cell-permeable, potent, and reversible inhibitor of JAK3 (IC <sub>50</sub> = 27 nM).	5 mg	420126
STAT3 Inhibitor III, WP1066	A cell-permeable analog of AG 490 (Cat. No. 658401) that acts as a STAT3 pathway inhibitor. Inhibits malignant glioma growth (IC <sub>50</sub> = 5.6 and 3.7 µM in U87-MG and U373-MG cells, respectively).	10 mg	573097
STAT3 Inhibitor V, Stattic 6-Nitrobenzo[b]thiophene-1, 1-dioxide	A cell-permeable inhibitor of STAT3 cellular function that targets the STAT3-SH2 domain and prevents its association with upstream kinases.	25 mg	573099
STAT5 Inhibitor II, IQDMA	A cell-permeable inhibitor of STAT5 signaling that inhibits the growth of various tumor cells (IC <sub>50</sub> = 8, 5, and 8 µM for A549, HL-60, and K562 cells, respectively).	10 mg	420294

\*Species: B: bovine, Ca: canine; Ch: chicken; Chp: chimpanzee; Eq: equine; H: human; M: mouse, Op: opossum; Pm: primate; R: rat; Sh: sheep; Xn: xenopus

\*\*Applications: ELISA: enzyme-linked immunosorbent assay; EMSA: electrophoretic mobility shift assay; FC: flow cytometry; ICC: immunocytochemistry, IF: immunofluorescence; IH: immunohistochemistry; IP: immunoprecipitation; Mplex: multiplexing; WB: Western blotting



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