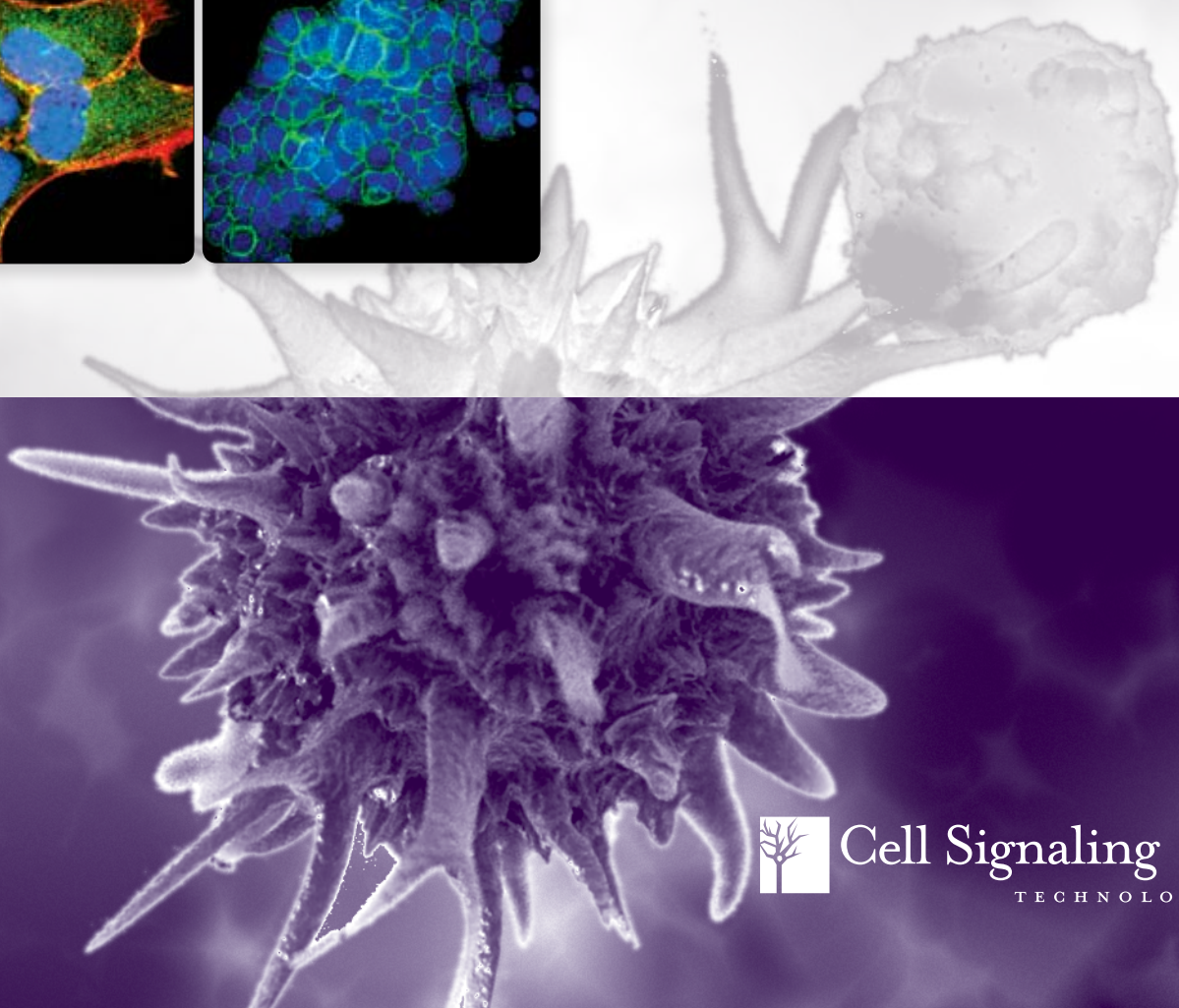


Antibodies and Kits  
for the Study of  
**Immunology**



Cell Signaling

TECHNOLOGY®

# What does Antibody Validation Mean at Cell Signaling Technology?

Scientists at Cell Signaling Technology (CST) follow a stringent validation protocol using a combination of several approaches and applications to provide you with the highest quality antibodies. This ensures credible and reproducible results with the least expenditure of your costly time, samples, and reagents.

## Antibody Validation at Cell Signaling Technology includes:

**Testing in a Number of Applications** to help you choose the antibody that works best in your experiment.

- Western blot
- Immunoprecipitation
- Immunohistochemistry
- Immunofluorescence
- Flow cytometry
- ChIP
- Sandwich ELISA

**Verifying Specificity and Reproducibility** to ensure that the antibody performs consistently in all applications specified.

- Treatment of cells with appropriate kinase-specific inhibitors to verify specificity
- Analysis of a large panel of cell lines with known target expression levels to confirm target specificity
- Phosphatase treatment to verify phospho-specificity
- Comparing antibody to isotype control antibody
- Verify target-specific signal in transfected cells, knock-out cells, or siRNA-treated cells
- Blocking with antigen peptide
- Verify correct subcellular localization or treatment-induced translocation
- Side-by-side comparison of a new lot with previous lots to ensure lot-to-lot consistency

**Identifying Optimal Conditions** to save your precious time, samples, and reagents.

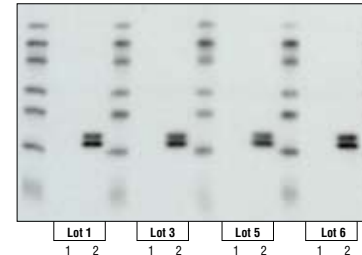
- Optimal dilutions and buffers predetermined
- Positive and negative control cell extracts specified
- Detailed protocols already optimized

## Side-by-side comparison of new lot with previous lots

**Phospho-p44/42 MAPK (Erk1/2) (Thr202/Tyr204) (D13.14.4E) XP™ Rabbit mAb #4370**

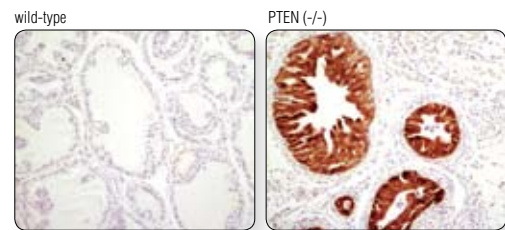
**Lot 1:** 10/3/2007      **Lot 5:** 1/29/2009  
**Lot 3:** 3/28/2008      **Lot 6:** 8/26/2009

- 1: Jurkat cells + U0126 (1 h)  
 2: Jurkat cells + TPA (10 min)



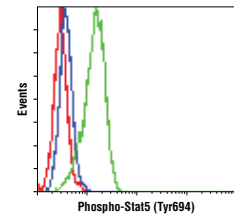
## Verification of target-specificity using mouse models

**Phospho-Akt (Ser473) (D9E) XP™ Rabbit mAb #4060** IHC analysis of paraffin-embedded WT (left) and PTEN (-/-) (right) mouse prostate using #4060. Tissue courtesy of Dr. David Guertin, The Whitehead Institute for Biomedical Research, Cambridge, MA.

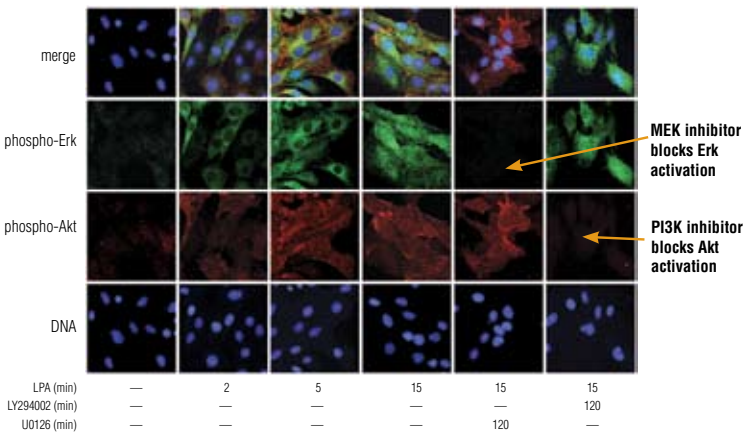


## Comparison of target-specific antibody to non-specific isotype control

**Phospho-Stat5 (Tyr694) (C71E5) Rabbit mAb #9314:** K-562 cells, untreated (green) or gefitinib-treated (blue), using #9314 compared to concentration matched Rabbit (DA1E) mAb IgG XP™ Isotype Control #3900 (red).



## Verification of specificity using known target activators and inhibitors



## Antibodies and Kits for the Study of

# Immunology

Cell Signaling Technology (CST) provides the highest quality activation-state and total protein antibodies available for the study of signaling pathways central to immunology. CST's antibodies have been extensively validated in-house for applications including flow cytometry, immunohistochemistry, immunofluorescence, ELISA, and drug discovery technologies. Furthermore, technical support is provided by the same scientists who produce and validate our products and know them best. Comprehensive and up-to-date product information can be found on our website.



The interface between naïve T cell and dendritic cells is called the immunological synapse (IS). This junction is formed between an antigen presenting dendritic cell (brown) and a naïve T cell (green). This is followed by cytoskeletal reorganization and clustering of many proteins at the synapse including T cell receptors as well as adhesion, signaling, and cytoskeletal molecules. Three major tyrosine kinases involved in the formation of the IS are Src, Syk and Tec. Activation of these kinases and their corresponding signaling cascades ultimately leads to the transcription of genes necessary for appropriate immune response.

# XMT™

## eXceptional Monoclonal Technology™

XMT™, a proprietary Monoclonal Technology from CST, enables the development and production of XP™ antibodies with eXceptional Performance™. This revolutionary and proprietary technology provides us with access to a broad range of antibody-producing B cells unattainable with traditional monoclonal technologies, allowing more comprehensive screening and the identification of XP monoclonal antibodies with:

### + exceptional specificity

As with all of our antibodies, the antibody is specific to your target of interest, saving you valuable time and resources.

### + exceptional sensitivity

The antibody will provide a stronger signal for your target protein in cells and tissues, allowing you to monitor expression of low levels of endogenous proteins, saving you valuable materials.

### + exceptional stability and reproducibility

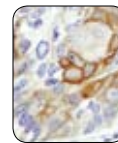
XMT combined with our stringent quality control ensures maximum lot-to-lot consistency and the most reproducible results.

### = eXceptional Performance

XMT coupled with our extensive antibody validation and stringent quality control delivers XP monoclonal antibodies with eXceptional Performance in the widest range of applications.

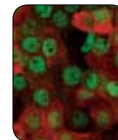
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## Table of Contents



# 4

Cytokine Signaling:  
Jak/Stat Signaling



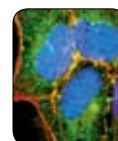
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Cytokine Signaling:  
Jak/Stat Utilization Table



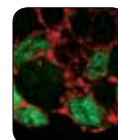
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Cytokine Signaling:  
Recombinant Cytokines  
& Growth Factors



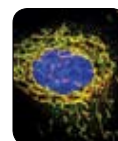
# 10

Cytokine Signaling:  
TLRs



# 12

Cytokine Signaling:  
TNFR & TRAF



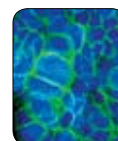
# 13

Cytokine Signaling:  
Innate Immunity, IRFs  
& Oxidative Stress



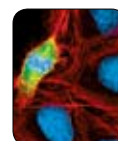
# 14

Cytokine Signaling:  
NF-κB Signaling



# 18

Lymphocyte Signaling:  
RTKs & Non-RTKs



# 20

Lymphocyte Signaling:  
Zap-70, Adaptor Proteins,  
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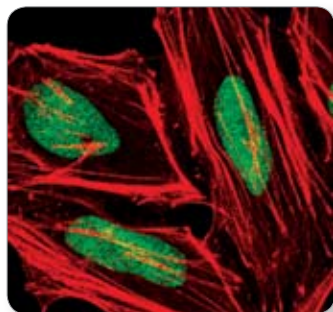


# 23

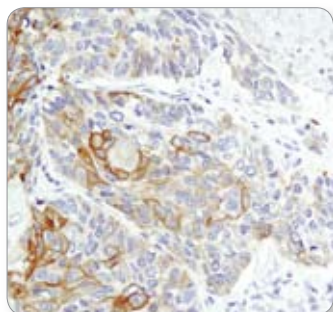
PhosphoSitePlus®

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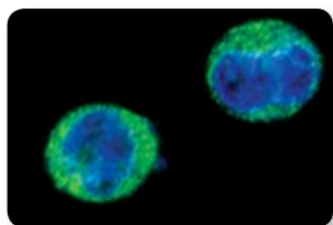
# Cytokine Signaling



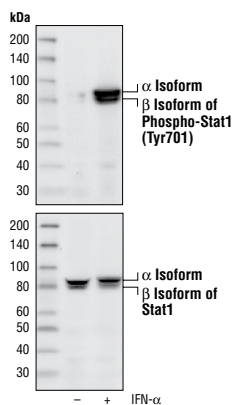
**PIAS1 (D33A7) XP™ Rabbit mAb #3550:** Confocal IF analysis of HeLa cells using #3550 (green). Actin filaments have been labeled with DY-554 phalloidin (red).



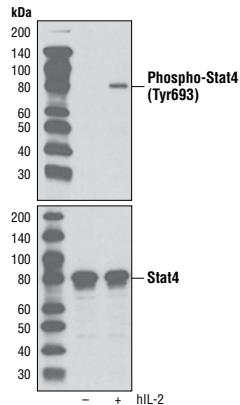
**Jak1 (6G4) Rabbit mAb #3344:** IHC analysis of paraffin-embedded human lung carcinoma using #3344.



**Jak2 (D2E12) XP™ Rabbit mAb #3230:** Confocal IF analysis of K-562 cells using #3230 (green). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).



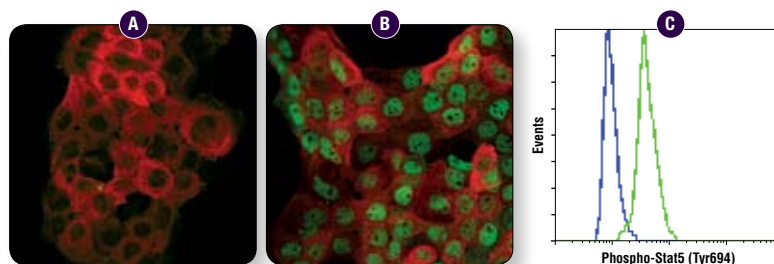
**Phospho-Stat1 (Tyr701) (58D6) Rabbit mAb #9167:** Western blot analysis of extracts from HeLa cells, untreated or IFN- $\alpha$ -treated, using #9167 (upper) or Stat1 Antibody #9172 (lower).



**Phospho-Stat4 (Tyr693) Antibody #5267:** Western blot analysis of extracts from NK-92 cells, untreated or treated with hIL-2 #8907 (2 ng/ml, 15 min), using #5267 (upper) or Stat4 (C46B10) Rabbit mAb #2653 (lower).

## Jak/Stat Signaling

	Applications	Reactivity
#3331 Phospho-Jak1 (Tyr1022/1023) Antibody	W	H, M, (R, B)
#3344 Jak1 (6G4) Rabbit mAb	W, IP, IHC-P	H, M, R, (Mk, Pg, Dg)
#3332 Jak1 Antibody	W	H, M, (R, B)
#3774 Phospho-Jak2 (Tyr221) Antibody	W	H, M, (R)
#3776 Phospho-Jak2 (Tyr1007/1008) (C80C3) Rabbit mAb	W	H, M, (R, Mk, B)
#3771 Phospho-Jak2 (Tyr1007/1008) Antibody	W, IP	H, M, R, (B)
#3230 Jak2 (D2E12) XP™ Rabbit mAb	W, IP, IHC-P, IF-IC, F	H, M, R, (Mk)
<b>NEW</b> #4040 Jak2 (D2E12) XP™ Rabbit mAb (Biotinylated)	W, F	H, M, R
<b>NEW</b> #4089 Immobilized Jak2 (D2E12) XP™ Rabbit mAb (Bead Conjugate)	IP	H, M, R, (Mk)
<b>NEW</b> #6235 SignalSilence® Jak2 siRNA I	W	H
#3775 Jak3 Antibody	W	H
<b>NEW</b> #3550 PIAS1 (D33A7) XP™ Rabbit mAb	W, IF-IC, F	H, M, R, Mk
<b>NEW</b> #4164 PIAS3 Antibody	W	H, M, R, Mk
<b>NEW</b> #3950 SOCS1 (A156) Antibody	W	H, M, R, Mk, (Dg)
#2779 SOCS2 Antibody	W, IP	H, M, R
<b>NEW</b> #2932 SOCS3 (L210) Antibody	W	H, M, R, (Mk, B, Dg)
#2923 SOCS3 Antibody	W	H, M, R
#8105 SignalSlide® Phospho-Stat1/3/5 IHC Controls	IHC-P	
<b>NEW</b> #8113 SignalStain® Phospho-Stat IHC Sampler Kit	IHC-P	H
#9167 Phospho-Stat1 (Tyr701) (58D6) Rabbit mAb	W, IP, IHC-P, IHC-F, IF-IC, F, ChIP	H, M
#9174 Phospho-Stat1 (Tyr701) (58D6) Rabbit mAb (Alexa Fluor® 488 Conjugate)	F	H, M
#9171 Phospho-Stat1 (Tyr701) Antibody	W, IP, IF-IC, F, ChIP	H, M, R, (B)
#9177 Phospho-Stat1 (Ser727) Antibody	W, IF-IC, F, ChIP	H, M, R
#9175 Stat1 (42H3) Rabbit mAb	W, IHC-P	H, Mk
#9172 Stat1 Antibody	W, IP, ChIP	H, M, R, Mk, (B)
#9176 Stat1 (9H2) Mouse mAb	W, IP	H, (B)
#9173 Stat1 Control Cell Extracts		
#6331 SignalSilence® Stat1 siRNA I		H
<b>NEW</b> #6544 SignalSilence® Stat1 siRNA II		H
<b>NEW</b> #6545 SignalSilence® Stat1 siRNA Kit		H
#4597 Stat2 Antibody (Mouse Specific)	W	M
#2523 Acetyl-Stat3 (Lys685) Antibody	W	H, (M, R)
#9145 Phospho-Stat3 (Tyr705) (D3A7) XP™ Rabbit mAb	W, IP, IHC-P, IHC-F, IF-IC, F, ChIP	H, M, R, Mk
#4323 Phospho-Stat3 (Tyr705) (D3A7) XP™ Rabbit mAb (Alexa Fluor® 488 Conjugate)	F	H, M, R, Mk
#4324 Phospho-Stat3 (Tyr705) (D3A7) XP™ Rabbit mAb (Alexa Fluor® 647 Conjugate)	F	H, M, R, Mk

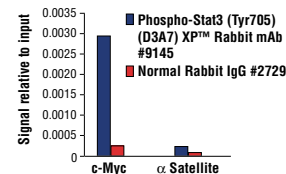
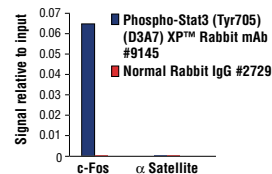


**Phospho-Stat5 (Tyr694) (D47E7) XP™ Rabbit mAb #4322:** Confocal IF analysis of A-431 cells, untreated (A) or EGF-treated (B), using #4322 (green) and Pan-Keratin (C11) Mouse mAb #4545 (red). Flow cytometric analysis of TF-1 cells (C), untreated (blue) or GM-CSF-treated (green), using #4322.

	Applications	Reactivity
<b>NEW #4093 Phospho-Stat3 (Tyr705) (D3A7) XP™ Rabbit mAb (Biotinylated)</b>	W	H, M, R, Mk
<b>NEW #4074 Immobilized Phospho-Stat3 (Tyr705) (D3A7) XP™ Rabbit mAb (Bead Conjugate)</b>	IP	H, M, R, Mk
<b>#9131 Phospho-Stat3 (Tyr705) Antibody</b>	W, IP, IF-IC, ChIP	H, M, R, C, (B)
<b>NEW #4113 Phospho-Stat3 (Tyr705) (M9C6) Mouse mAb</b>	W, IP, IHC-P, IF-IC, F	H, M, R, Mk
<b>#9138 Phospho-Stat3 (Tyr705) (3E2) Mouse mAb</b>	W, IP, F	H, M, (R, B)
<b>#9134 Phospho-Stat3 (Ser727) Antibody</b>	W, IP, IF-IC, ChIP	H, M, R, (B)
<b>#9136 Phospho-Stat3 (Ser727) (6E4) Mouse mAb</b>	W	H, M
<b>#4904 Stat3 (79D7) Rabbit mAb</b>	W, IP, IHC-P, ChIP	H, M, R, Mk
<b>NEW #4368 Immobilized Stat3 (79D7) Rabbit mAb (Bead Conjugate)</b>	IP	H, M, R, Mk
<b>#9132 Stat3 Antibody</b>	W, IP, IHC-P, ChIP	H, M, R, (B)
<b>#9139 Stat3 (124H6) Mouse mAb</b>	W, IP, IHC-P, IF-IC, F, ChIP	H, M, R, Mk
<b>#9133 Stat3 Control Cell Extracts</b>		
<b>#6580 SignalSilence® Stat3 siRNA I</b>		H
<b>#6582 SignalSilence® Stat3 siRNA II</b>		H
<b>#6583 SignalSilence® Stat3 siRNA Kit</b>		H
<b>NEW #5267 Phospho-Stat4 (Tyr693) Antibody</b>	W, IP	H, (M, R)
<b>#2653 Stat4 (C46B10) Rabbit mAb</b>	W	H, M, R
<b>NEW #5097 Stat4 (2A2) Mouse mAb</b>	W, IP	H
<b>NEW #4322 Phospho-Stat5 (Tyr694) (D47E7) XP™ Rabbit mAb</b>	W, IP, IF-IC, F	H, M, (R, Mk, B)
<b>#9359 Phospho-Stat5 (Tyr694) (C11C5) Rabbit mAb</b>	W, IP, IHC-P, F	H, M, (R, Mk, B)
<b>#9314 Phospho-Stat5 (Tyr694) (C71E5) Rabbit mAb</b>	W, IHC-P, IF-IC, F	H, M, (R, Mk, B)
<b>NEW #3939 Phospho-Stat5 (Tyr694) (C71E5) Rabbit mAb (Alexa Fluor® 488 Conjugate)</b>	F	H, M, (R, Mk, B)
<b>NEW #9365 Phospho-Stat5 (Tyr694) (C71E5) Rabbit mAb (Alexa Fluor® 647 Conjugate)</b>	F	H, M, (R, Mk, B)
<b>#9351 Phospho-Stat5 (Tyr694) Antibody</b>	W, F, ChIP	H, M, (R, B)
<b>#9356 Phospho-Stat5 (Tyr694) (14H2) Mouse mAb</b>	W, IP	H, M, (R)
<b>#9358 Stat5 (3H7) Rabbit mAb</b>	W, IP, ChIP	H, M, R
<b>#9363 Stat5 Antibody</b>	W, IP, ChIP	H, M, R
<b>NEW #4807 Stat5a (4H1) Mouse mAb</b>	W, IP, F	H
<b>#9353 Stat5 Control Cell Extracts</b>		
<b>#9364 Phospho-Stat6 (Tyr641) (C11A12) Rabbit mAb</b>	W	H, (Mk)
<b>#9361 Phospho-Stat6 (Tyr641) Antibody</b>	W, IP, IF-IC, F	H, (B)
<b>#9362 Stat6 Antibody</b>	W, IP	H, M, R, (B)
<b>#9321 Phospho-Tyk2 (Tyr1054/1055) Antibody</b>	W	H, (M, R)
<b>#9312 Tyk2 Antibody</b>	W, IP	H

**Selected Application References:**

- #3331 Phospho-Jak1 (Tyr1022/1023) Antibody:** Yamauchi, K. et al. (2006) *J. Neurochem.* 96, 1060–1070. (W, IHC); Guo, J.T. et al. (2005) *J. Virol.* 79, 1343–1350. (W)
- #3771 Phospho-Jak2 (Tyr1007/1008) Antibody:** Yamauchi, K. et al. (2006) *J. Neurochem.* 96, 1060–1070. (W)
- #9171 Phospho-Stat1 (Tyr701) Antibody:** Takagi, K. et al. (2005) *J. Immunol.* 174, 1801–1810. (W, IP); Zhang, Y. et al. (2005) *J. Biol. Chem.* 280, 34306–34315. (W); Hor, S. et al. (2004) *J. Biol. Chem.* 279, 33343–33351. (W); Bhanoori, M. et al. (2003) *Oncogene* 22, 117–130. (W); Spagnoli, A. et al. (2002) *J. Biol. Chem.* 277, 18860–18867. (W, IC)
- #9131 Phospho-Stat3 (Tyr705) Antibody:** Guo, Z. et al. (2004) *Nat. Med.* 10, 374–381. (W, IF); Weissenberger, J. et al. (2004) *Oncogene* 23, 3308–3316. (W, IHC); Hor, S. et al. (2004) *J. Biol. Chem.* 279, 33343–33351. (W); Mitsui, K. et al. (2003) *Cell* 113, 631–642. (W); Cavallo, F. et al. (2001) *Cancer Res.* 61, 3518–3523. (F)
- #9351 Phospho-Stat5 (Tyr694) Antibody:** Menon, M.P. et al. (2006) *Blood* 107, 2662–2672. (W); Bergonzini, V. et al. (2004) *Oncogene* 23, 7701–7711. (W); Brizzi, M.F. et al. (2002) *J. Clin. Invest.* 109, 111. (W, IHC, IC, IF); Fata, J.E. et al. (2000) *Cell* 103, 41–50. (IHC)
- #9361 Phospho-Stat6 (Tyr641) Antibody:** Woetmann, A. et al. (2003) *J. Biol. Chem.* 278, 2787–2791. (W); Steward, D.M. et al. (2001) *Endocrinology* 142, 98–107. (W, IF)
- #9321 Phospho-Tyk2 (Tyr1054/1055) Antibody:** Guo, J.T. et al. (2005) *J. Virol.* 79, 1343–1350. (W); Lejeune, D. et al. (2002) *J. Biol. Chem.* 277, 33676–33682. (W); Komatsu, T. et al. (2000) *J. Virol.* 74, 2477–2480. (W)
- #9312 Tyk2 Antibody:** Tassioulas, I. et al. (2004) *Nat. Immunol.* 5, 1181–1189. (W)

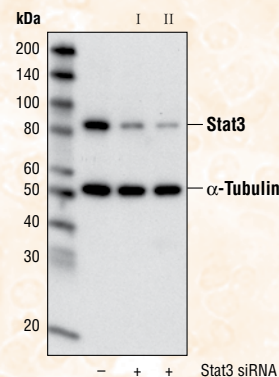


**Phospho-Stat3 (Tyr705) (D3A7) XP™ Rabbit mAb #9145:** Chromatin immunoprecipitations were performed with cross-linked chromatin from  $4 \times 10^6$  Hep G2 cells starved overnight and treated with IL-6 (100 ng/ml, for 30 min), and either 10  $\mu$ l of #9145 or 2  $\mu$ l of Normal Rabbit IgG #2729 using SimpleChIP™ Enzymatic Chromatin IP Kit (Magnetic Beads) #9003. The enriched DNA was quantified by real-time PCR using primers specific for the c-Fos gene (left), the c-Myc gene (right), and the heterochromatic a satellite repeat element (both). The amount of immunoprecipitated DNA in each sample is represented as signal relative to the total amount of input chromatin, which is equivalent to one.

## SignalSilence® siRNA

SignalSilence® siRNA duplexes from Cell Signaling Technology allow the researcher to specifically inhibit target protein expression.

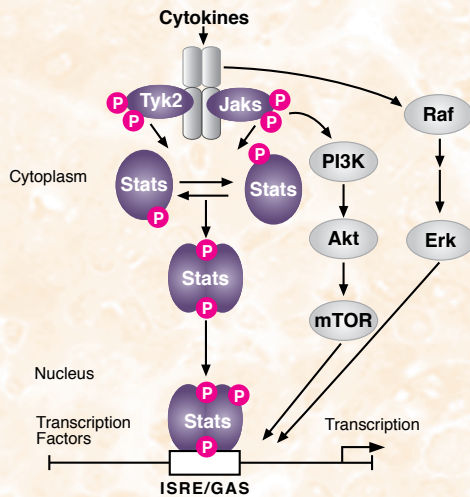
- siRNA duplexes are designed, produced, and purified in-house – siRNA products are held to the same stringent quality control standards as antibody products.
- Our offering of siRNA duplexes are used in-house for antibody validation – effective knockdown is assessed at the protein level.
- Technical support is provided by the same scientists who produce and validate the products – you have access to our Product Scientists to discuss transfection methods or any other questions.

**SignalSilence® Stat3 siRNA:**

Western blot analysis of extracts from HeLa cells, transfected with 100 nM SignalSilence® Control siRNA (Unconjugated) #6568 (-), SignalSilence® Stat3 siRNA I #6580 (+) or SignalSilence® Stat3 siRNA II #6582 (+), using Stat3 (79D7) Rabbit mAb #4904 and  $\alpha$ -Tubulin (11H10) Rabbit mAb #2125. The Stat3 (79D7) Rabbit mAb confirms silencing of Stat3 expression, while the  $\alpha$ -Tubulin (11H10) Rabbit mAb is used as a loading control.

## Jak/Stat Signaling

Cytokine signaling is integral to an efficient immune response. A key pathway involved in cytokine signaling is the Janus kinase-signal transducer and activator of transcription (Jak/Stat) pathway. Jaks and Stats regulate growth, survival, differentiation, and pathogen resistance. Cytokine binding induces receptor dimerization, thereby activating the associated Jaks which undergo autophosphorylation and subsequently phosphorylate the receptor. These phosphorylated sites serve as docking sites for the SH2 domain-containing Stats, such as Stat3, and for SH2-containing proteins and adaptors that link the receptor to MAP Kinase, PI3 Kinase/Akt, and other cellular pathways. Receptor-bound Stats phosphorylated by Jaks dimerize and translocate to the nucleus where they regulate target gene transcription.



Unparalleled  
Product Quality,  
Validation, and  
Technical Support

## Jak/Stat Utilization Table

Combinatorial use of Tyrosine Kinases and Stat Proteins in Cytokine/Growth Factor Signaling.

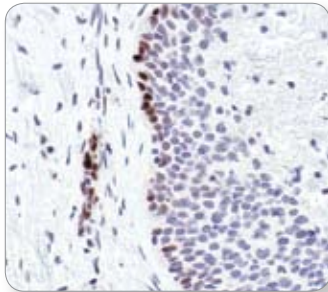
Ligand	Receptor	Jak-kinase	Other Tyrosine Kinases	Stat Family Members
IL-6	IL-6Ra+gp130	Jak1, Jak2, Tyk2	Hck	Stat1, Stat3
IL-11	IL-11R+gp130	Jak1, Jak2, Tyk2	Src, Yes	Stat3
CNTF, CT-1, LIF, OSM	CNTFR+gp130, CT-1R+gp130, LIFR+gp130, OSMR+gp130	Jak1, Jak2, Tyk2	Src family	Predominant: Stat3 Secondary: Stat1, Stat5
G-CSF	G-CSFR	Jak2, Tyk2	Lyn	Stat3
IL-12 (p40+p35)	IL-12Rβ1+IL-12Rβ2	Jak2, Tyk2	Lck	Stat4
Leptin	LeptinR	Jak2	not determined	Stat3, Stat5, Stat6
IL-3	IL-3Ra+βc	Jak2	Fyn, Hck, Lyn	Stat3, Stat5, Stat6
IL-5	IL-5R-βc	Jak2	Btk	Stat3, Stat5, Stat6
GM-CSF	GM-CSFR+βc	Jak2	Hck, Lyn	Stat3, Stat5
Angiotensin	GPCR	Jak2, Tyk2		Stat1, Stat2, Stat3
Serotonin	GPCR	Jak2		Stat3
α-Thrombin	GPCR	Jak2		Stat1, Stat3
Chemokines	CXCR4	Jak2, Jak3		
IL-2	IL-2Ra+IL-2Rb+yc	Jak1, Jak2, Jak3	Fyn, Hck, Lck, Syk, Tec	Stat3, Stat5
IL-4	IL-4Ra+ycR or IL-4Ra+IL-13Ra1	Jak1, Jak3	Lck, Tec	Stat6
IL-7	IL-7R+yc	Jak1, Jak3	Lyn	Stat3, Stat5
IL-9	IL-9R+yc	Jak1, Jak3	not determined	Stat1, Stat3, Stat5
IL-13	IL-13Ra1 + IL-4Ra	Jak1, Jak2, Tyk2	Ctk	Stat6
IL-15	IL-15Ra+IL-2Rβ+yc	Jak1, Jak3	Lck	Stat3, Stat5
IL-19	IL-20Ra+IL-20Rβ	Jak1, ?		Stat3
IL-20	IL-20Ra, IL-22R+IL-20Rβ	Jak1, ?		Stat3
IL-21	IL-21R+yc	Jak1, Jak3		Stat1, Stat3, Stat5
IL-22	IL-22R+IL-10Rβ	Jak1, Tyk2		Stat1, Stat3, Stat5
IL-23 (p40+p19)	IL-12Rβ1+IL-23R	Jak2, Tyk2		Stat4
IL-24	same as IL-20	Jak1, ?		Stat3
IL-26	IL-20Ra+IL-10Rβ	Jak1, Tyk2		Stat3
IL-27 (EBI3+p28)	gp130+WSX1	Jak1, Jak2, Tyk2		Stat1, Stat2, Stat3, Stat4, Stat5
IL-28A, IL28B, IL29	IL-28R+IL-10Rβ	Jak1, Tyk2		Stat1, Stat2, Stat3, Stat4, Stat5
IL-31	IL-31Ra+OSMR	Jak1, Jak2, Tyk2		Stat1, Stat3, Stat5
IL-35 (p35+EBI3)	gp130+WSX1	Jak1, Jak2, Tyk2		Stat1, Stat3, Stat5
GH	GHR	Jak2	Src family	Stat3, Stat5 (mainly Stat5a)
Tpo	TpoR (c-Mpl)	Tyk2, Jak2	Lyn	Stat1, Stat3, Stat5
Epo, Pro	EpoR, ProlactinR	Jak2	Src Family	Stat5 (mainly Stat5a)
Interferon (IFNα/β)	IFNAR1+IFNAR2	Jak1, Tyk2	Lck	Predominant: Stat1, Stat2 Secondary: Stat3, Stat4, Stat5
IFN-γ	IFN-γR1+IFN-γR2	Jak1, Jak2	Hck, Lyn	Stat1
IL-10	IL-10Ra+ IL-10Rβ	Jak1, Tyk2	not determined	Stat3, Stat1, Stat5
TLSP	TLSPR and IL7R	Jak1, possibly Jak2	not determined	Stat3, Stat5
EGF	EGFR	Jak1	EGFR, Src	Stat1, Stat3, Stat5
PDGF	PDGFR	Jak1, Jak2	PDGFR, Src	Stat1, Stat3, Stat5

# PhosphoPlus® Antibody Duets

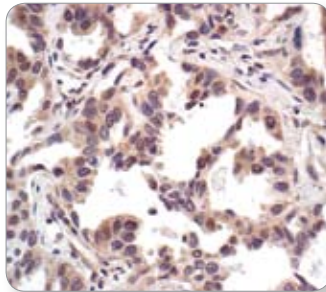
PhosphoPlus® Antibody Duets from Cell Signaling Technology (CST) provide a means to assess protein activation status. Each PhosphoPlus® Duet contains an activation-state and a total protein antibody to your target of interest. These antibodies have been selected from CST's product offering based upon superior performance in the specified applications.

	Applications	Reactivity
<b>NEW #8219 PhosphoPlus® IκBα (Ser32/Ser36) Antibody Duet</b>	W, IP, IHC-P	H, M, R, Mk, (Pg, B)
<b>NEW #8224 PhosphoPlus® Jak2 (Tyr1007/Tyr1008) Antibody Duet</b>	W	H, M, (R, Mk)
<b>NEW #8214 PhosphoPlus® NF-κB p65/RelA (Ser536) Antibody Duet</b>	W, IF-IC, F	H, M, R, Mk, (Dg)
<b>NEW #8217 PhosphoPlus® Stat1 (Tyr701) Antibody Duet</b>	W, IHC-P	H
<b>NEW #8204 PhosphoPlus® Stat3 (Tyr705) Antibody Duet</b>	W, IP, IHC-P, ChIP	H, M, R, Mk
<b>NEW #8215 PhosphoPlus® Stat5 (Tyr694) Antibody Duet</b>	W, IP	H, M, (R)

## PhosphoPlus® Stat3 (Tyr705) Antibody Duet #8204



**Phospho-Stat3 (Tyr705) (D3A7) XP™ Rabbit mAb #9145:** IHC analysis of paraffin-embedded human lung carcinoma, showing nuclear localization using #9145.



**Stat3 (79D7) Rabbit mAb #4904:** IHC analysis of paraffin-embedded human lung carcinoma, showing nuclear and cytoplasmic localization using #4904.

New **PhosphoPlus® Antibody Duets**  
*It takes two to tango*

kDa

Phospho-Stat5 (Tyr694)

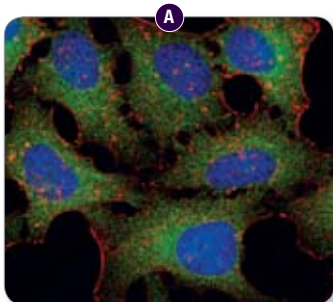
- + imatinib

kDa

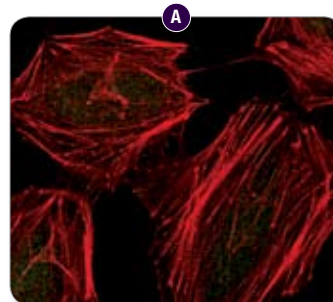
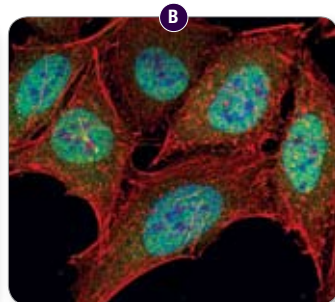
Stat5

- + imatinib

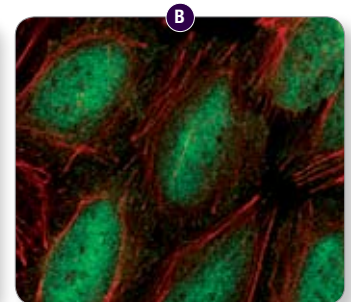
## PhosphoPlus® NF-κB p65/RelA (Ser536) Antibody Duet #8214



**NF-κB p65 (C22B4) Rabbit mAb #4764:** Confocal IF analysis of HeLa cells, untreated (A) or TNF-α-treated (20 ng/ml for 20 min, B), using #4764 (green). Actin filaments have been labeled with Alexa Fluor® 555 phalloidin (red). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).



**Phospho-NF-κB p65 (Ser536) (93H1) Rabbit mAb #3033:** Confocal IF analysis of HeLa cells, untreated (A) and TNF-α-treated (20 ng/ml for 20 min, B), using #3033 (green). Actin filaments have been labeled with Alexa Fluor® phalloidin 555 (red).



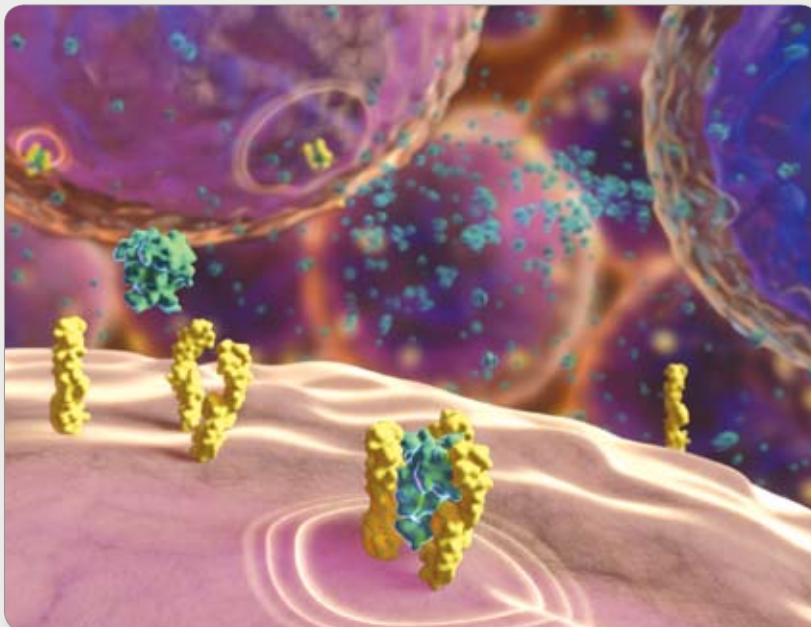
# New Recombinant Cytokines and Growth Factors

**The world's highest quality antibody provider has now extended its expertise to Recombinant Cytokine and Growth Factor production.**

Cell Signaling Technology (CST) is now offering a selection of recombinant cytokines and growth factors. These reagents are produced and bioassayed in-house, and are held to the same unparalleled quality standards as the CST antibodies you know and trust.

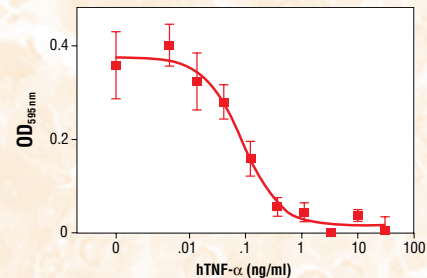
- Produced and bioassayed in-house with the highest purity and bioactivity.
- Comparison of multiple lots, stringent product specifications, and rigorous quality control ensure maximum lot-to-lot consistency.
- Most products are free of tags or additional amino acids, and many are produced in mammalian cells to maximize natural conformation and glycosylation.
- Validation includes the use of CST antibodies to assess downstream signaling events.
- Multi-milligram quantities always available.
- Carrier or carrier free formulation available.

Visit our website for the most up-to-date product listing.



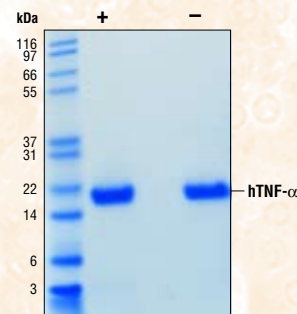
## Human Tumor Necrosis Factor- $\alpha$ (hTNF- $\alpha$ ) #8902

### Bioactivity



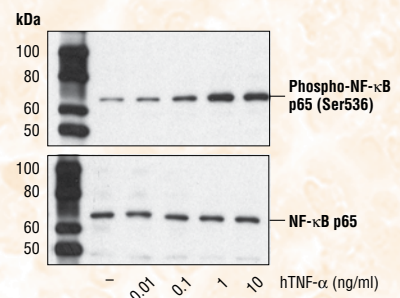
The viability of L-929 cells treated with increasing amounts of hTNF- $\alpha$  in the presence of 2 ng/ml actinomycin D was determined.

### Purity



6  $\mu$ g reduced (+) and non-reduced (-) hTNF- $\alpha$ ; hTNF- $\alpha$  does not contain tags or additional amino acids.

### Western Blot



Western blot analysis of extracts from HeLa cells treated with increasing amounts of hTNF- $\alpha$  for 20 min, using Phospho-NF- $\kappa$ B p65 (Ser536) (93H1) Rabbit mAb #3033 (upper) or NF- $\kappa$ B p65 Antibody #3034 (lower).



## Unparalleled Cytokine Quality, Consistency, and Dependability

### Cytokine Quality

- Most are greater than 98% pure as demonstrated by SDS-PAGE.
- Endotoxin levels are tested by the LAL assay and are less than 0.01 ng/μg cytokine.
- Reduced and non-reduced protein is run on SDS-PAGE.
- ED<sub>50</sub> or 50% maximum response is determined by a standard cell based assay for every lot.
- Several lots are tested side-by-side to ensure consistent bioactivity.
- Bioactivity and purity data is shown on each product webpage and datasheet.

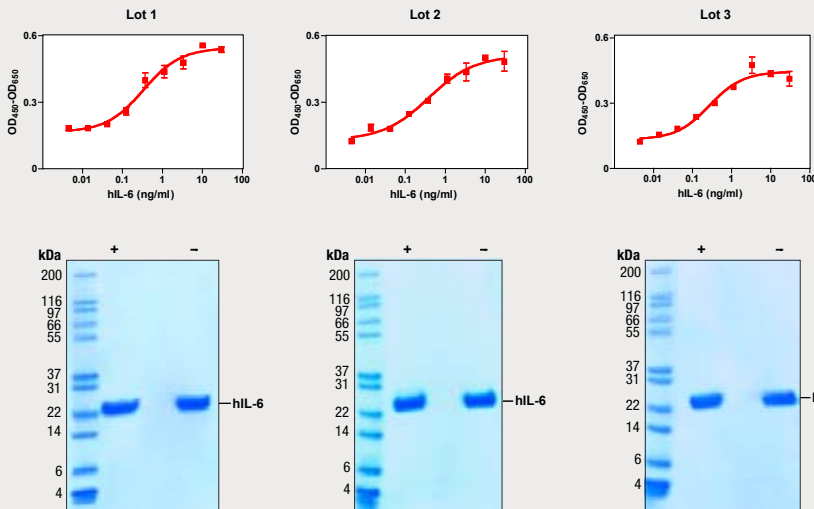
### Cytokine Consistency

- Strict specifications are set and enforced.
- Each lot is compared to previous lots for consistency in purity and bioactivity.
- Lyophilized lots are quality assured for sterility and bioactivity.

### Cytokine Dependability

- Products are produced in-house and ready to ship.
- Products are available in multi-milligram sizes.
- Most customers receive overnight delivery.
- CST sales and technical support ensure the highest quality customer service support.

### Lot-to-Lot Consistency



#### Comparison of purity and bioactivity of three independent lots of Human Interleukin-6 (hIL-6) #8904:

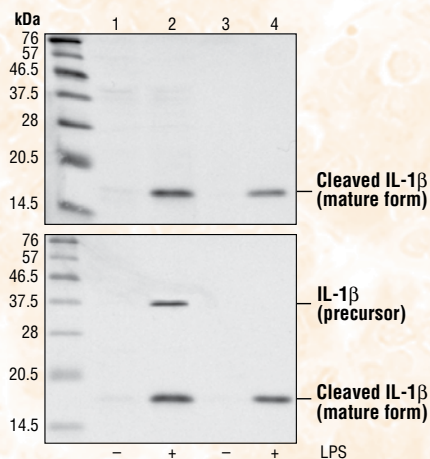
The proliferation of TF-1 cells was assessed after 48 h treatment with increasing concentrations of hIL-6. Cells were incubated with a tetrazolium salt and the OD<sub>450</sub> - OD<sub>650</sub> was determined (upper panels).

The purity of recombinant hIL-6 was determined by SDS-PAGE using 6 μg reduced (+) and non-reduced (-) recombinant hIL-6 and staining overnight with Coomassie Blue (lower panels).

#8916 Human Epidermal Growth Factor (hEGF)
#5493 Human Epigen
#5494 Human Epregrulin
#8910 Human Basic Fibroblast Growth Factor (hFGF basic/FGF2)
#8924 Human Fms-related Tyrosine Kinase 3 Ligand (hFLT3L)
#8930 Human Granulocyte Colony Stimulating Factor (hG-CSF)
#8922 Human Granulocyte Macrophage Colony Stimulating Factor (hGM-CSF)
#5191 Mouse Granulocyte Macrophage Colony Stimulating Factor (mGM-CSF)
#8927 Human Interferon-α1 (hIFN-α1)
#8901 Human Interferon-γ (hIFN-γ)
#8900 Human Interleukin-1β (hIL-1β)
#8907 Human Interleukin-2 (hIL-2)
#8918 Human Interleukin-3 (hIL-3)
#8923 Mouse Interleukin-3 (mIL-3)
#8919 Human Interleukin-4 (hIL-4)
#5208 Mouse Interleukin-4 (mIL-4)
#8904 Human Interleukin-6 (hIL-6)
#8903 Human Interleukin-10 (hIL-10)
#8905 Human Interleukin-13 (hIL-13)
#8928 Human Interleukin-17A (hIL-17A)
#8906 Human Interleukin-17F (hIL-17F)
#8920 Human Interleukin-21 (hIL-21)
#8931 Human Interleukin-22 (hIL-22)
#5224 Mouse Interleukin-22 (mIL-22)
#8929 Human Macrophage Colony Stimulating Factor (hM-CSF)
#5218 Human Neuregulin-1 (hNRG-1)
#8913 Human Platelet-Derived Growth Factor AA (hPDGF-AA)
#8912 Human Platelet-Derived Growth Factor BB (hPDGF-BB)
#8925 Human Stem Cell Factor (hSCF)
#5495 Human Transforming Growth Factor α (hTGF-α)
#8915 Human Transforming Growth Factor β1 (hTGF-β1)
#8406 Human Transforming Growth Factor β2 (hTGF-β2)
#8425 Human Transforming Growth Factor β3 (hTGF-β3)
#8902 Human Tumor Necrosis Factor-α (hTNF-α)
#5178 Mouse Tumor Necrosis Factor-α (mTNF-α)
#4698 Mouse <sub>His6</sub> Tumor Necrosis Factor-α (m <sub>His6</sub> TNF-α)
#8908 Human Vascular Endothelial Growth Factor-121 (hVEGF <sub>121</sub> )
#8065 Human Vascular Endothelial Growth Factor-165 (hVEGF <sub>165</sub> )

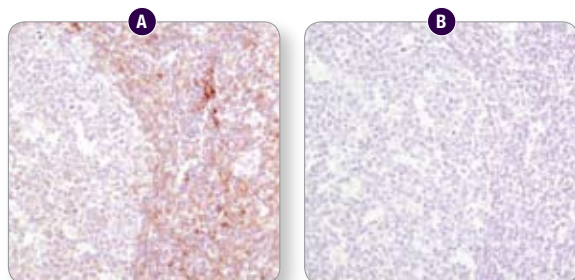
## IL-1 $\beta$

IL-1 $\beta$  is a pro-inflammatory cytokine produced predominantly by activated monocytes and epithelial cells. Precursor IL-1 $\beta$  is cleaved by caspase-1 and mature IL-1 $\beta$  is then secreted, targeting macrophages and many other cell types. Signaling by IL-1 $\beta$  occurs by IL-1 $\beta$  binding to IL-1 accessory protein (IL-1-ACp); the complex then binds to IL-1RI. Activation of the MAP Kinase and NF- $\kappa$ B pathways is triggered upon ligand binding. IL-1 $\beta$  plays critical roles in the acute phase response and sepsis.



### Cleaved IL-1 $\beta$ (Asp116) Antibody #2021 and IL-1 $\beta$ Antibody #2022:

Western blot analysis of extracts (lanes 1 and 2) and supernatants (lanes 3 and 4) from THP-1 cells, untreated or LPS-treated (10  $\mu$ g/ml, for 24 h), using #2021 (upper) or #2022 (lower). Cells were differentiated with 0.5  $\mu$ M TPA #4174 for 3 h. Cells were washed and plated onto 24-well plates at a density of 4 x 10<sup>6</sup> cells per well and left to adhere overnight prior to LPS treatment with the addition of 5 mM ATP for 1 h to stimulate release of IL-1 $\beta$ .



**TRAIL (C92B9) Rabbit mAb #3219:** IHC analysis of paraffin-embedded human tonsil using #3219 in the presence of control peptide (A) or antigen-specific peptide (B).

## Cytokine Signaling

		Applications	Reactivity
NEW	#4199 Cleaved Caspase-1 (Asp297) (D57A2) Rabbit mAb	W, IP	H, (Mk)
NEW	#3866 Caspase-1 (D7F10) Rabbit mAb	W, IP	H, (Mk)
	#2225 Caspase-1 Antibody	W, IP, IHC-P	H
	#3432 Cytokine Receptor Common $\beta$ -Chain Antibody	W	H, M, R, Mk, Mi
	#4233 Fas (C18C12) Rabbit mAb	W, IHC-P	H
	#4273 FasL Antibody	W, IP, E-P	H
	#3732 GP130 Antibody	W	H, M, Mk
	#3110 IFN- $\alpha$ (6B18) Mouse mAb	W, IP	H
	#3115 IFN- $\alpha$ (8C21) Mouse mAb	W, IP	H
	#3159 IFN- $\gamma$ (3F1E3) Mouse mAb	W, IP, E-P	H
NEW	#3865 IL-1RA (20D8) Mouse mAb	W	H
	#2021 Cleaved IL-1 $\beta$ (Asp116) Antibody	W	H
	#2022 IL-1 $\beta$ Antibody	W	H
NEW	#5370 IL-2R $\alpha$ Antibody	W	H
NEW	#4198 IL-2R $\beta$ Antibody	W	H
	#2988 RANTES (P20) Antibody	W	H, (Mk)
	#2987 RANTES (R40) Antibody	W	H, (Mk)
	#2989 RANTES Antibody (Rodent Specific)	W, IP	M, (R)
NEW	#3530 SDF1 (D32F9) Rabbit mAb	W, IP	H, R, (M)
	#3740 SDF1 Antibody	W	H, R, (M)
	#3707 TNF- $\alpha$ Antibody	W, IP	H, M, (R, Mk, Pg)
	#3684 TRADD (7G8) Rabbit mAb	W, IP	H
	#3694 TRADD Antibody	W, IP, F	H, M, R, Mk
	#3219 TRAIL (C92B9) Rabbit mAb	W, IP, IHC-P, IF-IC, F	H

## Toll-like Receptor Signaling

		Applications	Reactivity
NEW	#4283 MyD88 (D80F5) Rabbit mAb	W, IP	H, M, R, (Mk)
	#3699 MyD88 Antibody	W	H, Mk
	#2209 Toll-like Receptor 1 Antibody	W, IP	H, (Mk)
	#2229 Toll-like Receptor 2 Antibody	W	H, M, Mk
	#2219 Toll-like Receptor 4 Antibody (Rodent Specific)	W	M, (R)
	#2633 Toll-like Receptor 7 Antibody	W	H, M, R, (Mk, Dg)
	#2254 Toll-like Receptor 9 Antibody	W, IP, IF-IC	H
	#4748 Tollip Antibody	W	H, Mk
	#4596 TRIF Antibody	W, IP	H

## IRAK

		Applications	Reactivity
NEW	#4504 IRAK1 (D51G7) XP <sup>TM</sup> Rabbit mAb	W, IP, IF-IC	H, M, Mk
	#4359 IRAK1 Antibody (Human Specific)	W, IF-IC	H, Mk
NEW	#6253 SignalSilence <sup>®</sup> IRAK1 siRNA I	W	H
NEW	#6228 SignalSilence <sup>®</sup> IRAK1 siRNA II	W	H
	#4367 IRAK2 Antibody	W, IF-IC	H, M, R, Mk
	#4363 IRAK4 Antibody	W, IP	H, M, R, Mk
	#4369 IRAK-M Antibody	W, IF-IC	H, M, Mk

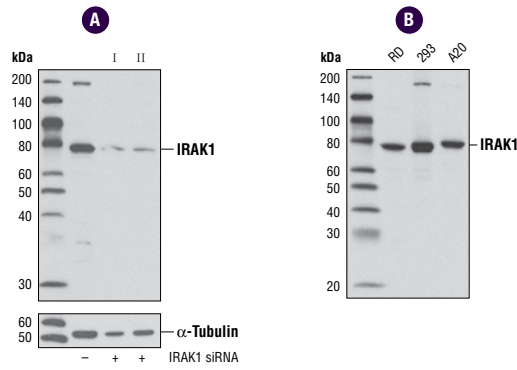
### Selected Application References:

#2021 Cleaved IL-1 $\beta$  (Asp116) Antibody: Martinon, F. et al. (2002) *Mol. Cell* 10, 417–426. (W)

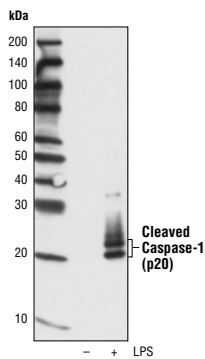
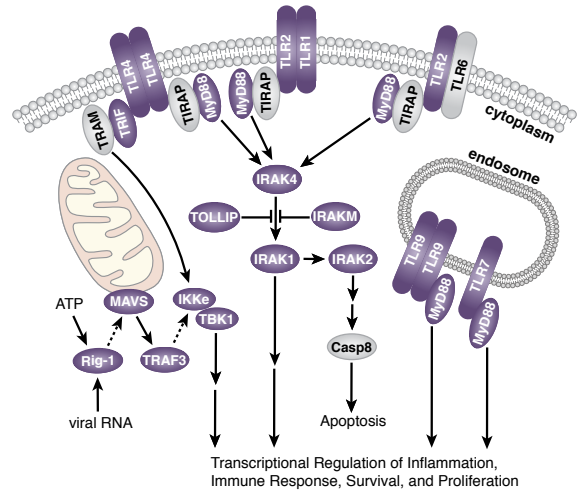
#3732 GP130 Antibody: Rho, J.Y. et al (2006) *Hum. Reprod.* 21, 405–412. (W)

### APPLICATIONS KEY:

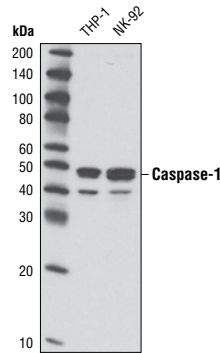
W Western / IP Immunoprecipitation / IHC Immunohistochemistry / IF Immunofluorescence / F Flow Cytometry / ChIP Chromatin Immunoprecipitation / (-IC Immunocytochemistry, -P Paraffin, -F Frozen) / E-P Peptide ELISA



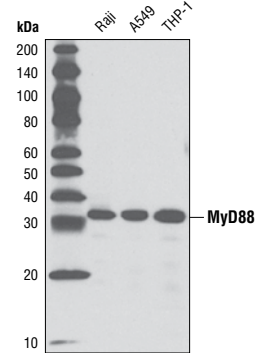
**IRAK1 (D51G7) XP™ Rabbit mAb #4504:** Western blot analysis of extracts from HeLa cells, transfected with 100 nM SignalSilence® Control siRNA (Unconjugated) #6568 (-), SignalSilence® IRAK1 siRNA I #6253 (+) or SignalSilence® IRAK1 siRNA II #6228 (+), using #4504 (upper) or  $\alpha$ -Tubulin (11H10) Rabbit mAb #2125 (lower). The IRAK1 (D51G7) XP™ Rabbit mAb confirms silencing of IRAK1 expression, while the  $\alpha$ -Tubulin (11H10) Rabbit mAb is used as a loading control (**A**). Western blot analysis of extracts from RD, 293, and A20 cells using #4504. (**B**).



**Cleaved Caspase-1 (Asp297) (D57A2) Rabbit mAb #4199:** Western blot analysis of extracts from the media of THP-1 cells, differentiated with TPA #4174 (80 nM, overnight) followed by treatment with LPS (1  $\mu$ g/ml, 8 h), using #4199.



**Caspase-1 (D7F10) Rabbit mAb #3866:** Western blot analysis of extracts from THP-1 and NK-92 cells using #3866.



**MyD88 (D80F5) Rabbit mAb #4283:** Western blot analysis of extracts from various cell lines using #4283.

## Antibody Sampler Kits

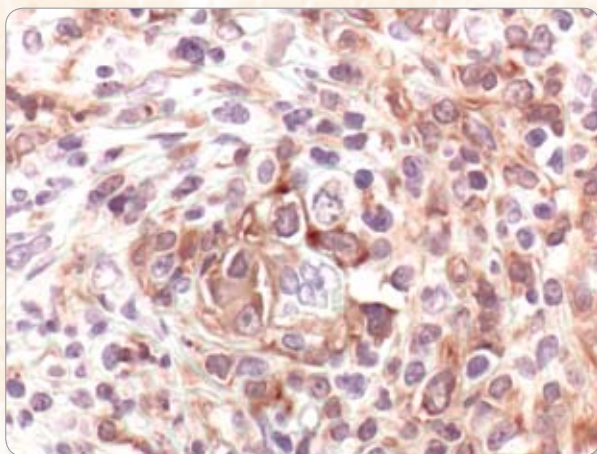
Antibody sampler kits offer an economical means to investigate various aspects of cellular signaling. These kits contain sample sizes of several antibodies directed against a protein, pathway, or cellular process of interest, as well as secondary antibodies and reagents needed for detection and analysis. Each antibody sampler kit contains enough primary and secondary antibodies to perform four western blots per target.



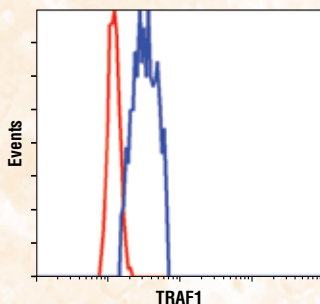
- #9958 Phospho-IKK $\alpha$ / $\beta$  (Ser176/180) Antibody Sampler Kit
- #9966 IKK Isoform Antibody Sampler Kit
- #4769 IRAK Isoform Antibody Sampler Kit
- #9945 Jak Isoform Sampler Kit
- NEW #9370 c-Kit Antibody Sampler Kit
- #9936 NF- $\kappa$ B Pathway Sampler Kit
- #4888 NF- $\kappa$ B Non-Canonical Pathway Antibody Sampler Kit
- #4766 NF- $\kappa$ B Family Member Antibody Sampler Kit
- #4767 NF- $\kappa$ B p65 Antibody Sampler Kit
- #9935 Src Antibody Sampler Kit
- #9914 Phospho-Stat Antibody Sampler Kit
- #9939 Stat Antibody Sampler Kit
- #9925 Phospho-Syk Antibody Sampler Kit
- #9971 Toll-like Receptor Antibody Sampler Kit

## TNFR and TRAF

The Tumor Necrosis Factor Receptor (TNFR) family that includes TNF-R1, TNF-R2, Fas, DR3, DR4, DR5, and DR6, plays an important role in the regulation of apoptosis in various physiological systems. These receptors are activated by a family of cytokines that includes TNF, FasL, and TRAIL. They are characterized by a highly conserved extracellular region containing cysteine-rich repeats and a conserved intracellular region of about 80 amino acids termed the death domain (DD). The DD is important for transducing the death signal by recruiting other DD containing adaptor proteins (FADD, TRADD, RIP) to the death-inducing signaling complex (DISC), resulting in the activation of caspases. TNFR family members activate NF- $\kappa$ B signaling in response to immune stimulus. TNF receptor-associated factors (TRAFs) are adaptor proteins that interact with TNFR family members. There are six known TRAFs in mammals. The cellular response is context dependent, varying with the particular TRAF involved and its specific binding partner.



**TRAF1 (1F3) Rat mAb #4710:** IHC analysis of paraffin-embedded human tonsil using #4710.



**TRAF1 (45D3) Rabbit mAb #4715:** Flow cytometric analysis of Raji cells using #4715 (blue) compared to a nonspecific negative control antibody (red).

## TNFR Family

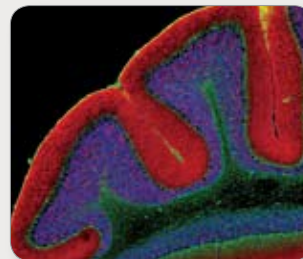
	Applications	Reactivity
#4756 DcR1 Antibody	W	H, M, R
<b>NEW</b> #4741 DcR2 Antibody	W	H
#4758 DcR3 Antibody	W	H, M, R
#3254 DR3 Antibody	W	H
#3696 DR5 Antibody	W	H
#4845 RANK Antibody	W	H, M, R
<b>NEW</b> #3959 RANK Ligand (R2) Antibody	W, IP	H, (Mk, Pg, B)
<b>NEW</b> #4816 RANK Ligand (L300) Antibody	W, IP	H, M, (R, Mk, Pg, B)
#3736 TNF-R1 (C25C1) Rabbit mAb	W, IP	H
#3727 TNF-R2 Antibody	W, IP	H, M, R, (Mk)
<b>NEW</b> #4437 TWEAK Antibody	W	H, (M, Mk)
#4403 TWEAK Receptor/Fn14 Antibody	W, IP	H, M, R, B

## TRAF

	Applications	Reactivity
#2141 TANK Antibody	W, IP	H, M, R, (Mk, B, Dg)
#4715 TRAF1 (45D3) Rabbit mAb	W, IP, IHC-P, IF-IC, F H, (Mk)	
#4710 TRAF1 (1F3) Rat mAb	W, IP, IHC-P, IF-IC	H, M, R
#4712 TRAF2 Antibody	W	H, M, R, Mk
#4724 TRAF2 (C192) Antibody	W, IP, IF-IC	H, M, Mk
#4729 TRAF3 Antibody	W	H, M, R, Mk
#4743 TRAF6 Antibody	W, IP	H

## NEW Alexa Fluor® Conjugated Secondary Antibodies

New Alexa Fluor® conjugated secondary antibodies offer improved fluorescence intensity and sensitivity, as well as photostability and pH stability over a wide range. These secondary antibodies are conjugated to Alexa Fluor® 488, 555, or 647 under optimal conditions and are tested in-house on human and mouse cell lines and tissue samples. Both the anti-mouse and anti-rabbit secondary antibodies are made with F(ab')<sub>2</sub> fragments, eliminating non-specific binding through Fc receptors present on the cell.



**Anti-Rabbit IgG (H+L), F(ab')<sub>2</sub> Fragment (Alexa Fluor® 555 Conjugate) #4413 and Anti-Mouse IgG (H+L), F(ab')<sub>2</sub> Fragment (Alexa Fluor® 488 Conjugate) #4408:** Confocal IF analysis of mouse cerebellum using  $\alpha$ -Synuclein Antibody (IF Preferred) #2628 detected with #4413 (red) and Neurofilament-L (DA2) Mouse mAb #2835 detected with #4408 (green). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).

- #4408 Anti-mouse IgG (H+L), F(ab')<sub>2</sub> Fragment (Alexa Fluor® 488 Conjugate)
- #4409 Anti-mouse IgG (H+L), F(ab')<sub>2</sub> Fragment (Alexa Fluor® 555 Conjugate)
- #4410 Anti-mouse IgG (H+L), F(ab')<sub>2</sub> Fragment (Alexa Fluor® 647 Conjugate)
- #4412 Anti-rabbit IgG (H+L), F(ab')<sub>2</sub> Fragment (Alexa Fluor® 488 Conjugate)
- #4413 Anti-rabbit IgG (H+L), F(ab')<sub>2</sub> Fragment (Alexa Fluor® 555 Conjugate)
- #4414 Anti-rabbit IgG (H+L), F(ab')<sub>2</sub> Fragment (Alexa Fluor® 647 Conjugate)
- #4416 Anti-rat IgG (H+L), (Alexa Fluor® 488 Conjugate)
- #4417 Anti-rat IgG (H+L), (Alexa Fluor® 555 Conjugate)
- #4418 Anti-rat IgG (H+L), (Alexa Fluor® 647 Conjugate)

## Cytoplasmic Innate Immune Response

	Applications	Reactivity
#3993 MAVS Antibody	W, IF-IC	H
#4983 MAVS Antibody (Rodent Specific)	W, IP, IF-IC	M, R
#4990 NALP1 Antibody	W	H, M, R, (Mk)
#3545 Nod1 Antibody	W	H, M, R, Mk
<b>NEW</b> #3743 Rig-I (D14G6) Rabbit mAb	W, IP	H, M, R, Mk
<b>NEW</b> #4200 Rig-I (D33H10) Rabbit mAb	W, IP	H, M, (Mk, B)
#4520 Rig-I Antibody	W	H, M, (Mk)

## Interferon Regulatory Factors (IRFs)

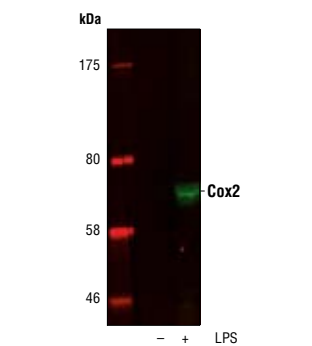
	Applications	Reactivity
#4943 IRF-2 Antibody	W, IP	H, M, R, (Mk)
#4947 Phospho-IRF-3 (Ser396) (4D4G) Rabbit mAb	W	H, M, R, (Mk)
<b>NEW</b> #4302 IRF-3 (D83B9) Rabbit mAb	W, IP	H, M, R, Mk
#4962 IRF-3 Antibody	W	H, Mk
<b>NEW</b> #4299 IRF-4 (D43H10) Rabbit mAb	W, IP, ChIP	H, R
#4964 IRF-4 Antibody	W, IP, IF-IC, F, ChIP	H
#4948 IRF-4 (P173) Antibody	W	H, M, R, (Mk)
#3257 IRF-5 Antibody	W, IP, IF-IC	H
#4950 IRF-5 Antibody (Rodent Specific)	W, IP	M, R
<b>NEW</b> #4920 IRF-7 Antibody	W, IP	H, (Mk)

## Oxidative Stress

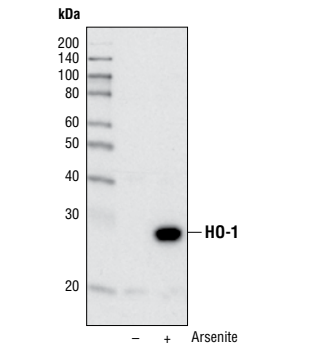
	Applications	Reactivity
#4841 Cox1 Antibody	W, IP, F	H, M, R, Mk
#4842 Cox2 Antibody	W, IHC-P	H, M, (R)
#3286 GPX1 (C8C4) Rabbit mAb	W, IP	H
#3206 GPX1 Antibody	W, IP	H
<b>NEW</b> #5141 HO-1 (P109) Antibody	W	H, M, R, Mk
<b>NEW</b> #5061 HO-1 (P249) Antibody	W	H
#2977 iNOS Antibody	W	H, M
#2982 iNOS Antibody (Mouse Specific)	W, IP	M
#3187 NQO1 (A180) Mouse mAb	W, IHC-P, IF-IC	H
<b>NEW</b> #4311 Phospho-p40phox (Thr154) Antibody	W	H, M
<b>NEW</b> #4312 p47phox Antibody	W, IP	H

### Selected Application References:

- #4947 Phospho-IRF-3 (Ser396) (4D4G) Rabbit mAb: Saitoh, T. et al. (2008) *Nature* 456, 264-8. (W)
- #4842 Cox2 Antibody: Lee, J.K. et al. (2004) *Proc. Natl. Acad. Sci. USA* 101,8815-8820. (W)
- #2977 iNOS Antibody: Tsukamoto, K. et al. (2008) *J. Immunol.* 180, 2054-61. (W)



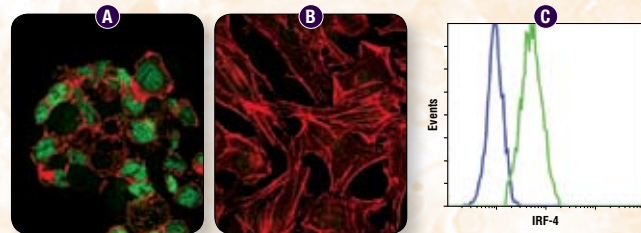
**Cox2 Antibody #4842:** Western blot analysis of extracts from Raw 264.7 cells, untreated or LPS-treated (1 µg/ml, for 6 h), using #4842.



**HO-1 (P249) Antibody #5061:** Western blot analysis of extracts from HeLa cells, untreated or arsenite-treated, using #5061.

## IRF-4

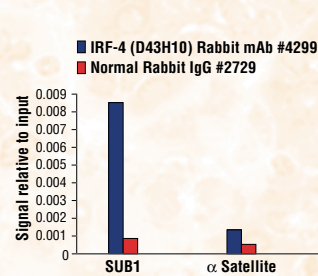
Interferon regulatory factors (IRFs) comprise a family of transcription factors that function within the Jak/Stat pathway to regulate interferon (IFN) and IFN-inducible gene expression. IRFs play an important role in pathogen defense, autoimmunity, lymphocyte development, cell growth, and susceptibility to transformation. IRF-4 plays many roles in lymphoid regulation. IRF-4 is expressed in all stages of B cell development and in mature T cells, and is inducible in primary lymphocytes by antigen mimetic stimuli such as concavalin A, CD3 crosslinking, anti-IgM, and TPA treatment.



**IRF-4 Antibody #4964:** Confocal IF analysis of RPMI 8226 cells (A) and HeLa cells (B) using #4964 (green). Actin filaments have been labeled with DY-554 phalloidin (red). Flow cytometric analysis of THP-1 cells (blue) and RPMI 8226 cells (green) using #4964 (C).

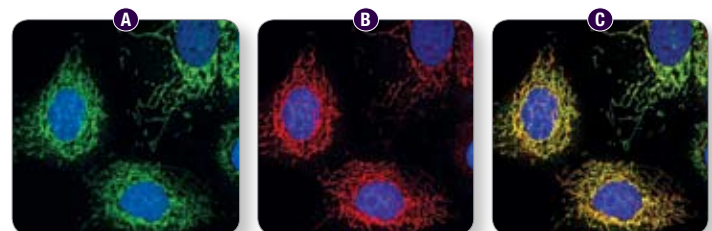
### Selected Application References:

- #4964 IRF-4 Antibody: Martin, H.J. et al. (2007) *J Virol* 81, 9748-58. (W)



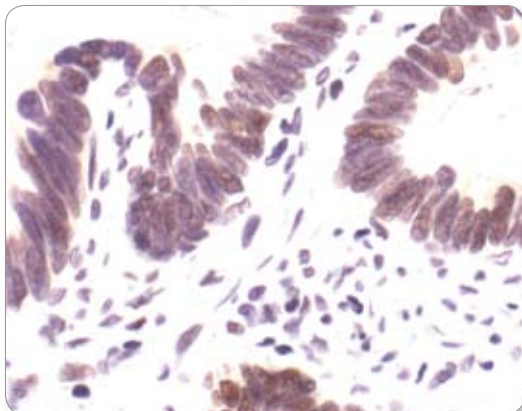
### IRF-4 (D43H10) Rabbit mAb #4299:

Chromatin immunoprecipitations were performed with cross-linked chromatin from  $4 \times 10^6$  NCI-H929 cells and either 5 µl of #4299 or 2 µl of Normal Rabbit IgG #2729 using SimpleChIP™ Enzymatic Chromatin IP Kit (Magnetic Beads) #9003. The enriched DNA was quantified by real-time PCR using primers specific for the SUB1 gene and the heterochromatic  $\alpha$  satellite repeat element. The amount of immunoprecipitated DNA in each sample is represented as signal relative to the total amount of input chromatin, which is equivalent to one.

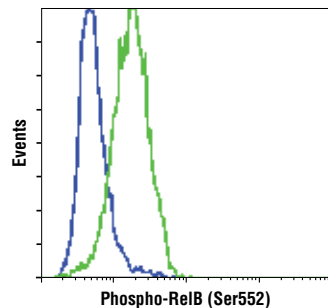


**MAVS Antibody #3993:** Confocal IF analysis of MCF7 cells using #3993 (green, A) showing colocalization with mitochondria that have been labeled with MitoTracker® Red CMXRos (red, B). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye). Merge of A and B is shown in C.

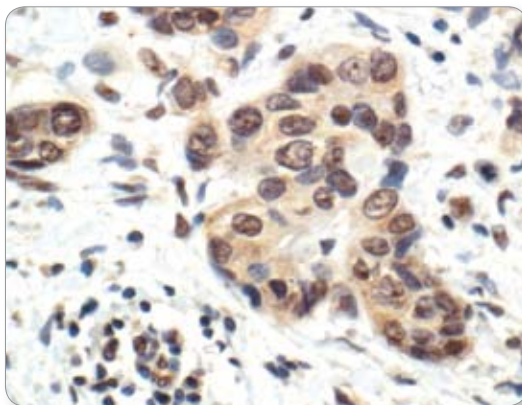
# Cytokine Signaling.....



**Phospho-NF-κB p65 (Ser276) Antibody #3037:** IHC analysis of paraffin-embedded human colon carcinoma using #3037.



**Phospho-RelB (Ser552) Antibody #4999:** Flow cytometric analysis of Raji cells, untreated (blue) or treated with TPA #4174 (green), using #4999.



**Phospho-IκBα (Ser32/36) (5A5) Mouse mAb #9246:** IHC analysis of paraffin-embedded human breast tumor using #9246.

## NF-κB

	Applications	Reactivity
#3045 Acetyl-NF-κB p65 (Lys310) Antibody	W, IP	H, M, (R, Mk, B, Dg)
#3037 Phospho-NF-κB p65 (Ser276) Antibody	W, IHC-P	H, M, R, (B, Dg)
#3039 Phospho-NF-κB p65 (Ser468) Antibody	W	H, M, R
#3033 Phospho-NF-κB p65 (Ser536) (93H1) Rabbit mAb	W, IP, IF-IC, F	H, M, R, Mk, Pg, Hm, (Dg)
#4886 Phospho-NF-κB p65 (Ser536) (93H1) Rabbit mAb (Alexa Fluor® 488 Conjugate)	F	H, M, R, Mk, Pg, Hm, (Dg)
#4887 Phospho-NF-κB p65 (Ser536) (93H1) Rabbit mAb (Alexa Fluor® 647 Conjugate)	F	H, M, R, Mk, Pg, Hm, (Dg)
#3031 Phospho-NF-κB p65 (Ser536) Antibody	W	H, M, R, Mk, (Dg)
#3036 Phospho-NF-κB p65 (Ser536) (7F1) Mouse mAb	W	H, M, R, Mk, Mi, (Dg)
#4764 NF-κB p65 (C22B4) Rabbit mAb	W, IHC-P, IF-IC, F	H, M, R, Mk, B, (Dg)
#3034 NF-κB p65 Antibody	W, IP	H, M, R, Mk, Mi, Hm, (Dg)
#6261 SignalSilence® NF-κB p65 siRNA I		H
<b>NEW</b> #6534 SignalSilence® NF-κB p65 siRNA II		H
<b>NEW</b> #6535 SignalSilence® NF-κB p65 siRNA Kit		H
#4810 Phospho-NF-κB2 p100 (Ser866/870) Antibody	W, IP	H, M, (R, B, Dg)
#3017 NF-κB2 p100/p52 (18D10) Rabbit mAb (Human Specific)	W, IHC-P, F	H, Mk
#4882 NF-κB2 p100/p52 Antibody	W, IP	H, M, R, Mk
#4806 Phospho-NF-κB p105 (Ser933) (18E6) Rabbit mAb	W, IP	H, M, R, Mk
#4808 Phospho-NF-κB p105 (Ser933) (178F3) Rabbit mAb (IHC Specific)	IHC-P	H
#4717 NF-κB1 p105 Antibody	W, IP	H, M, R, Mk, Mi, Pg, B
#3035 NF-κB1 p105/p50 Antibody	W, IP	H, Mk
#9243 NF-κB Control Cell Extracts		
#9777 Pirin (1E8) Rat mAb	W, IP, F	H, M, R, Mk, Hm, B
<b>NEW</b> #4999 Phospho-RelB (Ser552) Antibody	W, IP, IF-IC, F	H, M, (R, Mk, B, Dg)
#4922 RelB (C1E4) Rabbit mAb	W, IP	H, M, R, Mk
#4954 RelB Antibody	W, IP	H, M, R, Mk
<b>NEW</b> #4774 c-Rel (G57) Antibody	W	H, M, R, (Mk, Dg)
#4727 c-Rel Antibody	W, IP, IHC-P, IF-IC, F	H, Mk

## IκB

	Applications	Reactivity
#2859 Phospho-IκBα (Ser32) (14D4) Rabbit mAb	W, IP	H, M, R, Mk, (Pg)
#9246 Phospho-IκBα (Ser32/36) (5A5) Mouse mAb	W, IP, IHC-P	H, M, R, Mk, Dg, (Pg, B)
<b>NEW</b> #4088 Immobilized Phospho-IκBα (Ser32/36) (5A5) Mouse mAb (Bead Conjugate)	IP	H, M, R, Mk, Dg, (Pg, B)
#4812 IκBα (44D4) Rabbit mAb	W, IP	H, M, R, Mk, Mi, Hm
#9242 IκBα Antibody	W, IP	H, M, R, Mk, Pg, B, Dg
#4814 IκBα (L35A5) Mouse mAb (Amino-terminal Antigen)	W, IP, IHC-P, IF-IC, F	H, M, R, Mk, Pg, B
<b>NEW</b> #4078 Immobilized IκBα (L35A5) Mouse mAb (Amino-terminal Antigen) (Bead Conjugate)	IP	H, M, R, Mk, Pg, B
#9247 IκBα (112B2) Mouse mAb (Carboxy-terminal Antigen)	W, IP	H, M, R, Mk
#4921 Phospho-IκBβ (Thr19/Ser23) Antibody (Human Specific)	W	H, (Mk, Dg)
#9245 Phospho-IκBβ (Ser19/23) Antibody (Mouse/Rat Specific)	W	M, R
#9248 IκBβ Antibody	W	H, M, R, Mk
#4924 Phospho-IκBε (Ser18/22) Antibody	W	H, M, R, (B, Dg)
#9249 IκBε Antibody	W	H, M, R, Mk
#9244 IκB-ζ Antibody	W, IP	H

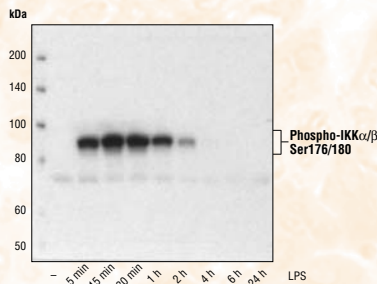
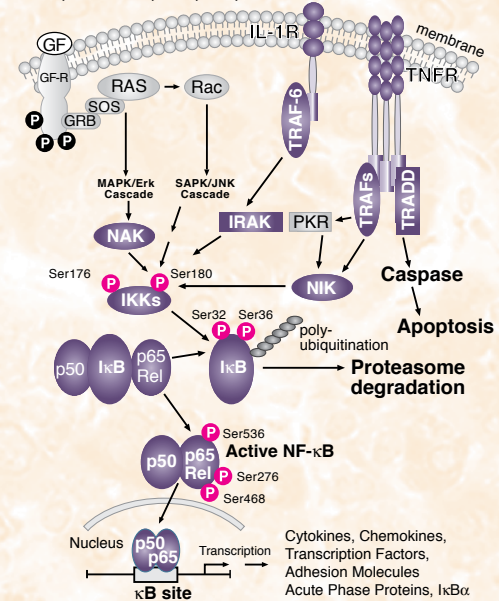
### APPLICATIONS KEY:

W Western / IP Immunoprecipitation / IHC Immunohistochemistry / IF Immunofluorescence / F Flow Cytometry / ChIP Chromatin Immunoprecipitation / (-IC Immunocytochemistry, -P Paraffin, -F Frozen) / E-P Peptide ELISA

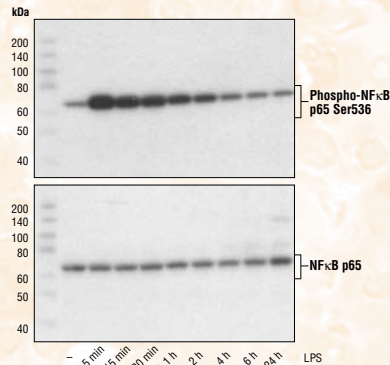
## NF- $\kappa$ B

Nuclear factor- $\kappa$ B (NF- $\kappa$ B)/Rel proteins include NF- $\kappa$ B2 p52/p100, NF- $\kappa$ B1 p50/p105, c-Rel, RelA/p65 and RelB. These proteins function as dimeric transcription factors that control genes regulating a broad range of biological processes including innate and adaptive immunity, inflammation, stress responses, B cell development, and lymphoid organogenesis. In the canonical pathway, NF- $\kappa$ B/Rel proteins are bound to and inhibited by I $\kappa$ B proteins in the cytoplasm. Proinflammatory cytokines, LPS, growth factors, and antigen receptors activate the IKK complex (IKK $\alpha$ , IKK $\beta$ , and IKK $\gamma$ /NEMO), which phosphorylates I $\kappa$ B proteins. Phosphorylation of I $\kappa$ B leads to its ubiquitination and proteasomal degradation, freeing NF- $\kappa$ B/Rel complexes. Active NF- $\kappa$ B/Rel complexes are further activated by phosphorylation and translocate to the nucleus where, either alone or in combination with other transcription factors, they induce target gene expression. In the noncanonical NF- $\kappa$ B pathway, NF- $\kappa$ B2 p100/RelB complexes are inactive in the cytoplasm. Signaling through a subset of receptors including LT $\beta$ R, CD40 and BR3 activates the kinase NIK, which in turn activates IKK $\alpha$  complexes that phosphorylate C-terminal residues in NF- $\kappa$ B2 p100. Phosphorylation of NF- $\kappa$ B2 p100/RelB leads to its ubiquitination and proteasomal processing to NF- $\kappa$ B2 p52, creating transcriptionally competent NF- $\kappa$ B p52/RelB complexes that translocate to the nucleus and induce target gene expression.

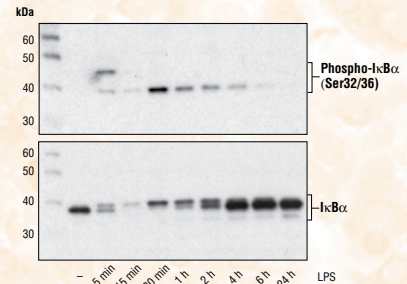
### Inflammatory Cytokines, Growth Factors, CD23, CD3/CD28, LPS, Fas, etc.



**Phospho-IKK $\alpha/\beta$  (Ser176/180) (16A6) Rabbit mAb #2697:** Western blot analysis of extracts from THP-1 cells, differentiated with TPA #4174 (80 nM, for 24 h) and treated with 1  $\mu$ g/ml LPS for the indicated times, using #2697.



**Phospho-NF- $\kappa$ B p65 (Ser536) (93H1) Rabbit mAb #3033 and NF- $\kappa$ B p65 (C22B4) Rabbit mAb #4764:** Western blot analysis of extracts from THP-1 cells, differentiated with TPA #4174 (80 nM, for 24 h) and treated with 1  $\mu$ g/ml LPS for the indicated times, using #3033 (upper) and #4764 (lower).

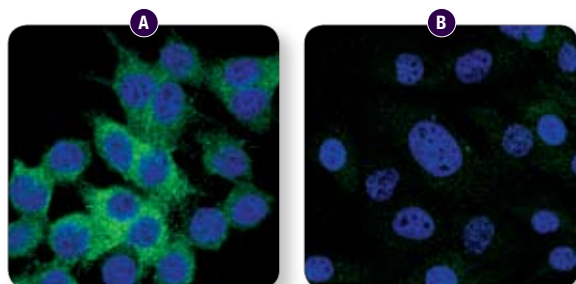


**Phospho-I $\kappa$ B $\alpha$  (Ser32/36) (5A5) Mouse mAb #9246 and I $\kappa$ B $\alpha$  (L35A5) Mouse mAb (Amino-terminal Antigen) #4814:** Western blot analysis of extracts from THP-1 cells, differentiated with TPA #4174 (80 nM, for 24 h) and treated with 1  $\mu$ g/ml LPS for the indicated times, using #9246 (upper) and #4814 (lower).

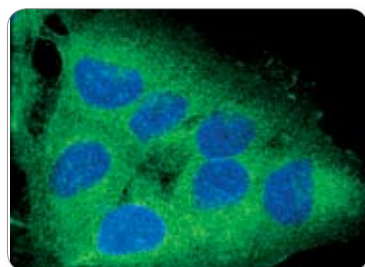
### Selected Application References:

- #3033 Phospho-NF- $\kappa$ B p65 (Ser536) (93H1) Rabbit mAb:** Lacasa, D. et al. (2007) *Endocrinology* 148, 868-77. (W); Suzuki, S. et al. (2007) *J. Biol. Chem.* 282, 25177-81. (W); Lou, H. and Kaplowitz, N. (2007) *J. Biol. Chem.* 282, 29470-81. (W); Peiser, M. et al. (2008) *J. Leukoc. Biol.* 83, 1118-27. (ELISA); Luedde, T. et al. (2008) *Proc. Natl. Acad. Sci. USA* 105, 9733-8. (W); Vince, J.E. et al. (2008) *J. Cell. Biol.* 182, 171-84. (W); Yadav, U.C. et al. (2009) *Invest. Ophthalmol. Vis. Sci.* 50, 2276-82. (IF-P); Dai, P. et al. (2009) *J. Immunol.* 182, 3450-60. (W); Millsom, M.D. et al. (2009) *Blood* 113, 5111-20. (W); Liu, M. et al. (2009) *Am. J. Pathol.* 174, 1910-20. (W); Yamanaka, Y. et al. (2009) *Blood* 114, 3265-75. (W); Solt, L.A. et al. (2009) *J. Biol. Chem.* 284, 27596-608. (W); Wang, H. et al. (2009) *J. Immunol.* 183, 4755-63. (IHC-F)
- #9246 Phospho-I $\kappa$ B $\alpha$  (Ser32/36) (5A5) Mouse mAb:** Basak, S. et al. (2007) *Cell* 128, 369-81. (W); Wright, A. et al. (2007) *Dev. Cell* 13, 705-16. (IHC-P); Chen, Y. et al. (2007) *J. Immunol.* 178, 49-57. (W); Lou, H. and Kaplowitz, N. (2007) *J. Biol. Chem.* 282, 29470-81. (W, K); Schultz, C. et al. (2006) *Mol. Cell Neurosci.* 33, 68-80. (W); Gao, H. et al. (2004) *Mol. Cell* 14, 303-317. (W); Nair, A. et al. (2003) *Oncogene* 22, 50-58. (IHC); Casciati, A. et al. (2002) *J. Neurochem.* 83, 1019-29. (W); Howe, C.J. et al. (2002) *J. Biol. Chem.* 277, 30469-30476. (W)
- #9242 I $\kappa$ B $\alpha$  Antibody:** Ho, R.C. et al. (2005) *Am. J. Physiol. Cell Physiol.* 389, C794-801. (W); Todd, D.E. et al. (2004) *Oncogene* 23, 3284-3295. (W)
- #4814 I $\kappa$ B $\alpha$  (L35A5) Mouse mAb (Amino-terminal Antigen):** Cui, W. et al. (2007) *Proc. Natl. Acad. Sci. USA* 104, 14436-41. (W)

# Cytokine Signaling.....



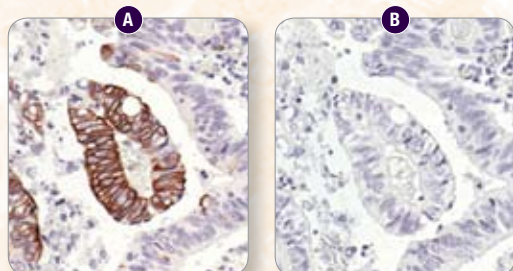
**IKK $\epsilon$  (D61F9) XP™ Rabbit mAb #3416:** Confocal IF analysis of Raw 264.7 (A) and C2C12 (B) cells using #3416 (green). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).



**RIP (D94C12) XP™ Rabbit mAb #3493:** Confocal IF analysis of OVCAR8 cells using #3493 (green). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).

## IKK

The NF- $\kappa$ B/Rel transcription factors are present in the cytosol in an inactive state, complexed with the inhibitory I $\kappa$ B proteins. Most agents that activate NF- $\kappa$ B do so through a common pathway based on phosphorylation-induced, proteasome-mediated degradation of I $\kappa$ B. The key regulatory step in this pathway involves activation of a high molecular weight I $\kappa$ B kinase (IKK) complex, whose catalysis is generally carried out by three tightly associated IKK subunits. IKK $\alpha$  and IKK $\beta$  serve as the catalytic subunits of the kinase and IKK $\gamma$  serves as the regulatory subunit. Activation of IKK depends upon phosphorylation; Ser177 and Ser181 in the activation loop of IKK $\beta$  (Ser176 and Ser180 in IKK $\alpha$ ) are the specific sites whose phosphorylation causes conformational changes resulting in kinase activation.



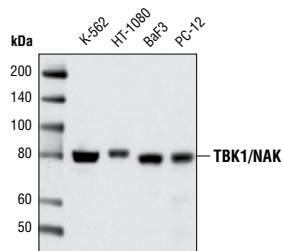
**Phospho-IKK $\alpha$ / $\beta$  (Ser176/180) (16A6) Rabbit mAb #2697:** IHC analysis of paraffin-embedded human colon carcinoma, untreated (A) or  $\lambda$ -phosphatase-treated (B), using #2697.

## NF- $\kappa$ B Regulating Proteins

	Applications	Reactivity
#4625 A20/TNFAIP3 Antibody	W, IP	H, (Mk)
<b>NEW</b> #4664 ABIN-1 Antibody	W, IP	H, M, R, (Mk)
#4237 Bcl10 (C78F1) Rabbit mAb	W, IP	H, M, R, (Mk)
#4435 CARD11 (1D12) Rabbit mAb	W	H, M, (R, Mk)
#4440 CARD11 Antibody	W	H, M, R
<b>NEW</b> #4495 CYLD Antibody	W, IP	H, Mk
#2884 ERC1 (P85) Antibody	W, IP	H, M, R, (Mk)
#2885 ERC1 $\alpha$ (D1055) Antibody	W, IP	H
#2078 Phospho-IKK $\alpha$ (Ser176)/IKK $\beta$ (Ser177) (C84E11) Rabbit mAb	W	H, M, (R, Mk, B)
#2697 Phospho-IKK $\alpha$ / $\beta$ (Ser176/180) (16A6) Rabbit mAb	W, IHC-P, IHC-F	H, M, R, Mk, (B)
#2687 Phospho-IKK $\alpha$ / $\beta$ (Ser176/180) Antibody	W	H, M, R, Mk, (B)
#2694 Phospho-IKK $\alpha$ / $\beta$ (Ser176/180) Antibody II	W	H, M, R, Mk
#2681 Phospho-IKK $\alpha$ (Ser180)/IKK $\beta$ (Ser181) Antibody	W	H, M, (R, B)
#2682 IKK $\alpha$ Antibody	W, IP	H, M, R, Mk, (B)
#2370 IKK $\beta$ (2C8) Rabbit mAb	W	H, M, R, Mk
#2684 IKK $\beta$ Antibody	W	H, R, Mk
#2678 IKK $\beta$ (L570) Antibody (IP Preferred)	W, IP	H, M, R, Mk, Hm, B
#2689 Phospho-IKK $\gamma$ (Ser376) Antibody	W	H
#2685 IKK $\gamma$ Antibody	W, IHC-P	H, M, R, Mk
#2695 IKK $\gamma$ (DA10-12) Mouse mAb	W	H, M, R
<b>NEW</b> #3416 IKK $\epsilon$ (D61F9) XP™ Rabbit mAb	W, IP, IF-IC, F	M, R
#2905 IKK $\epsilon$ (D20G4) Rabbit mAb	W, IP	H, (Mk)
#2690 IKK $\epsilon$ Antibody	W	H, M, R
#2494 MALT1 Antibody	W, IP	H, M, R
<b>NEW</b> #4109 MDA-5 (K375) Antibody	W, IP	H, M, R
<b>NEW</b> #4110 MDA-5 (R470) Antibody	W, IP	H
#4994 NIK Antibody	W, IP	H, M, (R, Mk, B)
<b>NEW</b> #4679 RAGE Antibody	W	H, M, R, (Mk)
<b>NEW</b> #3493 RIP (D94C12) XP™ Rabbit mAb	W, IP, IF-IC	H, M, R, Mk, Hm
#4926 RIP Antibody	W, IP, IF-IC, F	H, M, R, Mi
#4364 Phospho-RIP2 (Ser176) Antibody	W, IP	H, M, (R)
#4982 RIP2 Antibody	W	H, M, Mk, (R)
<b>NEW</b> #3504 TBK1/NAK (D1B4) Rabbit mAb	W, IP	H, M, R, (Mk)
#3013 TBK1/NAK Antibody	W, IP	H, M, R, Mk

### Selected Application References:

- #2681 Phospho-IKK $\alpha$  (Ser180)/IKK $\beta$  (Ser181) Antibody: Todaro, M. et al. (2005) *Arthritis Rheum.* 52, 2179–2191. (W); Howe, C.J. et al. (2002) *J. Biol. Chem.* 277, 30469–30476. (W); Saijo, K. et al. (2002) *J. Exp. Med.* 195, 1647–1652. (W)  
 #2687 Phospho-IKK $\alpha$ / $\beta$  (Ser176/180) Antibody: Ho, R.C. et al. (2005) *Am. J. Physiol. Cell Physiol.* 389, C794–801. (W)  
 #2682 IKK $\alpha$  Antibody: Ho, R.C. et al. (2005) *Am. J. Physiol. Cell Physiol.* 389, C794–801. (W); Makino, K. et al. (2004) *Oncogene* 23, 3883–3887. (W); Field, N. et al. (2003) *J. Cell Sci.* 116, 3721–3728. (W)  
 #2684 IKK $\beta$  Antibody: Ho, R.C. et al. (2005) *Am. J. Physiol. Cell Physiol.* 389, C794–801. (W); Makino, K. et al. (2004) *Oncogene* 23, 3883–3887. (W); Gao, H. et al. (2004) *Mol. Cell* 14, 303–317. (W)



**TBK1/NAK (D1B4) Rabbit mAb #3504:** Western blot analysis of extracts from various cell lines using #3504.



# PathScan® Sandwich ELISA

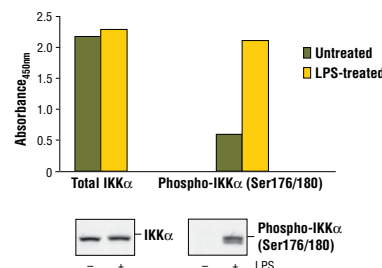
Cell Signaling Technology (CST) has applied its expertise to identify antibody pairs with optimal activity in solid phase sandwich enzyme-linked immunosorbent assays (ELISA). These assays enable the detection of low amounts of target protein from cell lysates. In-house development, production, and validation of these kits ensure the highest possible product quality and support. Technical support is provided by the same scientists that produce the ELISA products, and know them best. Antibody pairs provide an economical alternative to our complete ELISA kits.

## Antibody Pairs

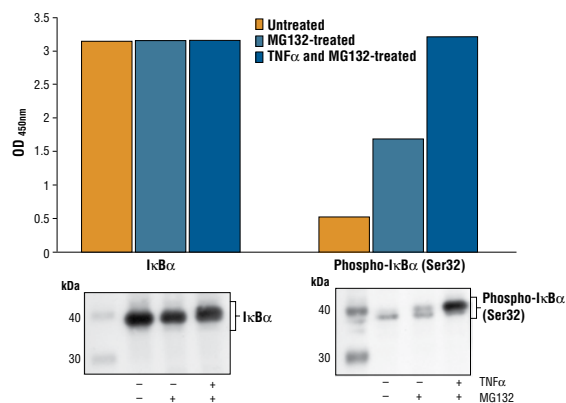
	Reactivity
<b>NEW #7343 PathScan® Phospho-IκBα (Ser32) Sandwich ELISA Antibody Pair</b>	H, M
<b>NEW #7831 PathScan® Total IκBα Sandwich ELISA Antibody Pair</b>	H, M
<b>#7294 PathScan® Phospho-c-Kit (panTyr) Sandwich ELISA Antibody Pair</b>	H
<b>#7299 PathScan® Phospho-c-Kit (Tyr719) Sandwich ELISA Antibody Pair</b>	H
<b>NEW #7937 PathScan® Phospho-LAT (Tyr191) Sandwich ELISA Antibody Pair</b>	H
<b>NEW #7993 PathScan® Phospho-Lck (Tyr505) Sandwich ELISA Antibody Pair</b>	H
<b>NEW #7834 PathScan® Phospho-NF-κB p65 (Ser536) Sandwich ELISA Antibody Pair</b>	H, M
<b>NEW #7836 PathScan® Total NF-κB p65 Sandwich ELISA Antibody Pair</b>	H, M
<b>NEW #7992 PathScan® Total Src Sandwich ELISA Antibody Pair</b>	H, M
<b>NEW #7146 PathScan® Phospho-Stat3 (Tyr705) Sandwich ELISA Antibody Pair</b>	H, M
<b>NEW #7281 PathScan® Phospho-Stat5 (Tyr694) Sandwich ELISA Antibody Pair</b>	H
<b>NEW #7852 PathScan® Phospho-Zap-70 (Tyr319) Sandwich ELISA Antibody Pair</b>	H
<b>NEW #7850 PathScan® Total Zap-70 Sandwich ELISA Antibody Pair</b>	H

## Kits

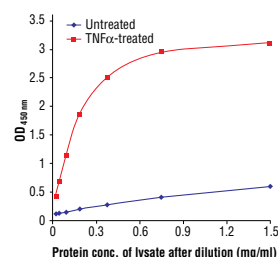
	Reactivity
<b>#7276 PathScan® Inflammation Multi-Target Sandwich ELISA Kit</b>	H, M
<b>#7272 PathScan® Signaling Nodes Multi-Target Sandwich ELISA Kit</b>	H, M
<b>#7206 PathScan® Phospho-FLT3 (Tyr591) Sandwich ELISA Kit</b>	H
<b>#7202 PathScan® Total FLT3 Sandwich ELISA Kit</b>	H
<b>#7355 PathScan® Phospho-IκBα (Ser32) Sandwich ELISA Kit</b>	H, M
<b>#7360 PathScan® Total IκBα Sandwich ELISA Kit</b>	H, M
<b>NEW #7073 PathScan® Phospho-IKKα (Ser176/180) Sandwich ELISA Kit</b>	H
<b>NEW #7078 PathScan® Total IKKα Sandwich ELISA Kit</b>	H
<b>#7231 PathScan® Phospho-c-Kit (panTyr) Sandwich ELISA Kit</b>	H
<b>#7298 PathScan® Phospho-c-Kit (Tyr719) Sandwich ELISA Kit</b>	H
<b>NEW #7936 PathScan® Phospho-LAT (Tyr191) Sandwich ELISA Kit</b>	H
<b>#7197 PathScan® Total c-Kit Sandwich ELISA Kit</b>	H
<b>NEW #7941 PathScan® Phospho-Lck (Tyr505) Sandwich ELISA Kit</b>	H
<b>#7173 PathScan® Phospho-NF-κB p65 (Ser536) Sandwich ELISA Kit</b>	H, M
<b>#7174 PathScan® Total NF-κB p65 Sandwich ELISA Kit</b>	H, M
<b>NEW #7984 PathScan® Total Src Sandwich ELISA Kit</b>	H, M
<b>#7234 PathScan® Phospho-Stat1 (Tyr701) Sandwich ELISA Kit</b>	H
<b>#7300 PathScan® Phospho-Stat3 (Tyr705) Sandwich ELISA Kit</b>	H, M
<b>NEW #7149 PathScan® Phospho-Stat3 (Tyr705) Chemiluminescent Sandwich ELISA Kit</b>	H, M
<b>#7113 PathScan® Phospho-Stat5 (Tyr694) Sandwich ELISA Kit</b>	H
<b>#7171 PathScan® Phospho-Zap-70 (Tyr319) Sandwich ELISA Kit</b>	H
<b>#7172 PathScan® Total Zap-70 Sandwich ELISA Kit</b>	H



**PathScan® Phospho-IKKα (Ser176/180) Sandwich ELISA Kit #7073 and PathScan® Total IKKα Sandwich ELISA Kit #7078:** Treatment of differentiated THP-1 cells with LPS stimulates phosphorylation of IKKα at Ser176/180 as detected by #7073 but does not affect the levels of total IKKα detected by #7078. Differentiated THP-1 cells were treated with 1 μg/ml LPS for 10 min. The absorbance readings at 450 nm are shown in the top figure, while the corresponding western blots using IKKα Antibody #2682 (left) or Phospho-IKKα/β (Ser176/180) (16A6) Rabbit mAb #2697 (right) are shown in the bottom figure.



**PathScan® Phospho-IκBα (Ser32) Sandwich ELISA Kit #7355 and PathScan® Total IκBα Sandwich ELISA Kit #7360:** Treatment of HeLa cells with TNF-α stimulates phosphorylation of IκBα at Ser32, detected by #7355, but does not affect the level of total IκBα protein detected by #7360. Treatment with MG132, a proteasome inhibitor (37°C for 180 min before TNF-α induction), causes accumulation of phospho-IκBα in control and TNF-α-treated cells, shown in both Sandwich ELISA and Western blot analysis. OD<sub>450</sub> readings are shown in the top figure, while the corresponding Western blot using Phospho-IκBα (Ser32) Antibody #9241 (right) or IκBα (L27H11) Mouse mAb #7361 (left), is shown in the bottom figure.

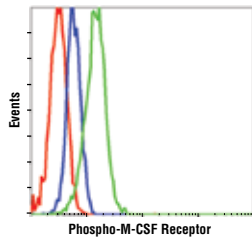


**PathScan® Phospho-IκBα (Ser32) Sandwich ELISA Kit #7355:** Linear relationship between protein concentration of lysates from untreated and TNF-α-treated HeLa cells and kit assay optical density readings. HeLa cells (70-85% confluence) were treated with TNF-α (10 ng/ml, 5 min at 37°C).

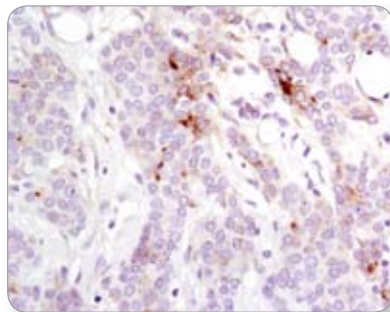
# Lymphocyte Signaling

## Receptor Tyrosine Kinases

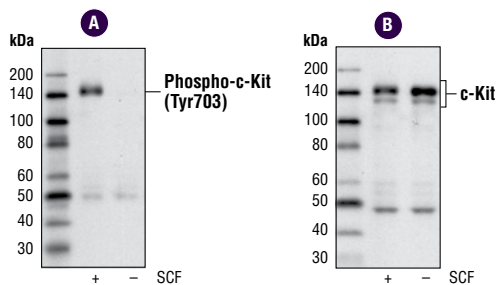
Receptor Tyrosine Kinases (RTKs) are enzymes that catalyze the phosphorylation of tyrosine residues. They have three domains: an extracellular ligand binding domain, a transmembrane domain and an intracellular domain that contains the catalytic domain. Upon ligand binding, RTKs dimerize, autophosphorylate and subsequently phosphorylate downstream signaling molecules involved in many cellular processes including immune response, growth and differentiation, metabolism, and migration. RTKs are often found to be constitutively activated in many different types of cancer.



**Phospho-M-CSF Receptor (Tyr723) (49C10) Rabbit mAb #3155:** Flow cytometric analysis of BaF3-CSF-1R cells, untreated (blue) or mCSF-treated (green), using #3155 compared to a nonspecific negative control antibody (red).



**SCF (C19H6) Rabbit mAb #2093:** IHC analysis of paraffin-embedded human breast carcinoma using #2093.



**Phospho-c-Kit (Tyr703) (D12E12) Rabbit mAb #3073 and c-Kit Antibody #3392:** Western blot analysis of extracts of NCI-H526 cells, untreated or SCF-treated, using #3073 (A) or #3392 (B).

### Selected Application References:

- #2861 Phospho-c-Abl (Tyr245) Antibody:** Smith, K.M. et al. (2003) *Mol. Cell* 12, 27–37. (W); Komatsu, N. et al. (2002) *J. Biol. Chem.* 278, 6411–6419. (W)
- #3461 Phospho-FLT3 (Tyr591) Antibody:** Yang, X. et al. (2005) *Cancer Res.* 65, 7338–7347. (W)
- #3154 Phospho-M-CSF Receptor (Tyr809) Antibody:** Rohde, C.M. et al. (2004) *J. Biol. Chem.* 279, 43448–43461. (W)
- #3391 Phospho-c-Kit (Tyr719) Antibody:** Petti, F. et al. (2005) *Mol. Cancer Ther.* 4, 1186–1197. (W)

## Bcr-Abl & Abl

	Applications	Reactivity
<b>NEW #3098 Phospho-c-Abl (Tyr89) (61A6) Rabbit mAb</b>	W	H
<b>NEW #3009 Phospho-c-Abl (Tyr204) (C42B5) Rabbit mAb</b>	W, IP	H, (M)
<b>#2868 Phospho-c-Abl (Tyr245) (73E5) Rabbit mAb</b>	W	H, (M)
<b>#2861 Phospho-c-Abl (Tyr245) Antibody</b>	W	H, (M)
<b>#2865 Phospho-c-Abl (Tyr412) (247C7) Rabbit mAb</b>	W	H, (M)
<b>#2864 Phospho-c-Abl (Thr735) Antibody</b>	W	H
<b>#2862 c-Abl Antibody</b>	W, IP, IF-IC	H, M, R
<b>#3908 Bcr-Abl (b<sub>2</sub>a<sub>2</sub> Junction Specific) (L99H4) Mouse mAb</b>	W	H
<b>#3901 Phospho-Bcr (Tyr177) Antibody</b>	W, IHC-P, F	H, M
<b>#3902 Bcr Antibody</b>	W, IF-IC, F	H, M, R, Pg

## FLT3

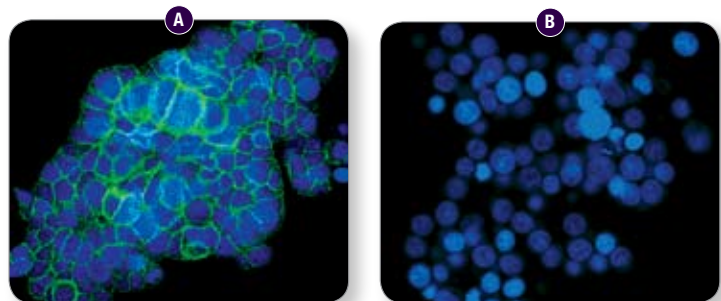
	Applications	Reactivity
<b>#3464 Phospho-FLT3 (Tyr589/591) (30D4) Rabbit mAb</b>	W	H, M
<b>#3474 Phospho-FLT3 (Tyr591) (33G6) Rabbit mAb</b>	W	H, M
<b>#3461 Phospho-FLT3 (Tyr591) Antibody</b>	W	H, M
<b>#3466 Phospho-FLT3 (Tyr591) (54H1) Mouse mAb</b>	W	H, M
<b>#4577 Phospho-FLT3 (Tyr842) (10A8) Rabbit mAb</b>	W, IP	H, M
<b>#3463 Phospho-FLT3 (Tyr969) (C24D9) Rabbit mAb</b>	W	H, M
<b>#3462 FLT3 (8F2) Rabbit mAb</b>	W, IP, IHC-P	H, M

## M-CSF Receptor

	Applications	Reactivity
<b>NEW #3083 Phospho-M-CSF Receptor (Tyr546) Antibody</b>	W	H, M
<b>NEW #3399 Phospho-M-CSF Receptor (Tyr699) Antibody</b>	W	H, M
<b>NEW #3080 Phospho-M-CSF Receptor (Tyr708) Antibody</b>	W	H, M
<b>#3155 Phospho-M-CSF Receptor (Tyr723) (49C10) Rabbit mAb</b>	W, IP, IHC-P, F	H, M
<b>#3151 Phospho-M-CSF Receptor (Tyr723) Antibody</b>	W	H, M
<b>#3154 Phospho-M-CSF Receptor (Tyr809) Antibody</b>	W	H, M
<b>NEW #3406 Phospho-M-CSF Receptor (Tyr923) Antibody</b>	W	H, (M)
<b>#3152 M-CSF Receptor Antibody</b>	W	H, M

## c-Kit

	Applications	Reactivity
<b>NEW #3073 Phospho-c-Kit (Tyr703) (D12E12) Rabbit mAb</b>	W, IP	H
<b>#3391 Phospho-c-Kit (Tyr719) Antibody</b>	W	H, M
<b>#3074 c-Kit (D13A2) XP™ Rabbit mAb</b>	W, IP, IF-IC	H, M
<b>#3392 c-Kit Antibody</b>	W	H
<b>#3308 c-Kit (Ab81) Mouse mAb</b>	W, IP, IF-IC, F	H
<b>#3310 c-Kit (Ab81) Mouse mAb (Alexa Fluor® 488 Conjugate)</b>	IF-IC, F	H
<b>NEW #2093 SCF (C19H6) Rabbit mAb</b>	W, IHC-P, F	H
<b>#2273 SCF Antibody</b>	W	H



**c-Kit (D13A2) XP™ Rabbit mAb #3074:** Confocal IF analysis of NCI-H562 (A) and Jurkat (B) cells using #3074 (green). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).

**Src Family & Csk**

	Applications	Reactivity
#3262 Blk Antibody	W	H
#4980 Csk (C74C1) Rabbit mAb	W	H, M, R, Mk, Pg
#2755 Fgr Antibody	W, IP, F	H
#4023 Fyn Antibody	W	H, M
#4352 Hck Antibody	W	H, M, Mk
#2751 Phospho-Lck (Tyr505) Antibody	W, IP	H, M
#2984 Lck (D88) XPT™ Rabbit mAb	W, IHC-P	H
#2787 Lck (73A5) Rabbit mAb	W, IP, IF-IC, F	H
#2752 Lck Antibody	W	H, M
#2714 Lck (V49) Antibody	W, IP	H
#2657 Lck (L22B1) Mouse mAb	W, IP	H
#2731 Phospho-Lyn (Tyr507) Antibody	W	H, M, (R)
#2796 Lyn (C13F9) Rabbit mAb	W, IP, IHC-P	H
#2732 Lyn Antibody	W, IP	H, M, R
#4576 Lyn (5G2) Mouse mAb	W	H
#2113 Phospho-Src Family (Tyr416) (100F9) Rabbit mAb	W	H, M, R, (C)
#2101 Phospho-Src Family (Tyr416) Antibody	W	H, M, R, (C, X)
#2102 Non-phospho-Src (Tyr416) (7G9) Mouse mAb	W, IP	H, M, R, (C, X)
#2105 Phospho-Src (Tyr527) Antibody	W, IHC-P	H, M, R, (C)
#2107 Non-phospho-Src (Tyr527) Antibody	W	H, M, R, (C)
#2109 Src (36D10) Rabbit mAb	W, IP, IHC-P, IHC-F, IF-F, IF-IC, F	H, M, R, Mk, Pg, Hm, B, (C)
#2123 Src (32G6) Rabbit mAb	W, IP	H, M, R, (C)
#2108 Src Antibody	W, IP, IHC-P, IF-F, IF-IC, F	H, M, R, Mk, (C)
#2110 Src (L4A1) Mouse mAb	W, IP	H, M, R, Mk, (C)
#2734 Yes Antibody	W, IHC-P	H, M

**Tec, Itk & Btk**

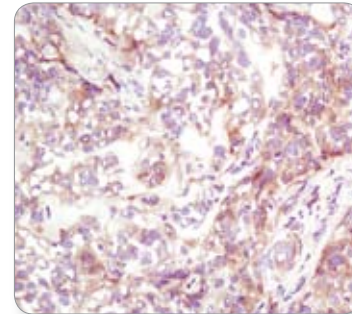
	Applications	Reactivity
#3138 Phospho-Ack1 (Tyr284) Antibody	W	H, (M, R)
<b>NEW</b> #3097 Phospho-Ack1 (Tyr857/858) (C57E10) Rabbit mAb	W	H, (M)
#3137 Phospho-Ack1 (Tyr857/858) Antibody	W	H, M
#3537 Phospho-Btk (Ser180) (3D3) Mouse mAb	W	H, (M)
<b>NEW</b> #5082 Phospho-Btk (Tyr223) Antibody	W	H, (M, R)
#3533 Btk (C82B8) Rabbit mAb	W	H
#3532 Btk Antibody	W	H, M
#3211 Phospho-Etk (Tyr40) Antibody	W, IP	H
<b>NEW</b> #4268 Fer (5D2) Mouse mAb	W, IP	H, M
#2736 Fes Antibody	W, IP, F	H
#2380 Itk (2F12) Mouse mAb	W, IP	H, (M, R, Mk)
#4987 Tec Antibody	W	H, M
<b>NEW</b> #4553 Phospho-TNK1 (Tyr277) Antibody	W	H
<b>NEW</b> #4570 TNK1 (C44F9) Rabbit mAb	W	H

**Selected Application References:**

- #2751 **Phospho-Lck (Tyr505) Antibody**: Rahmouni, S. et al. (2005) *Mol. Cell Biol.* 25, 2227–2241. (W); Tani-ichi, S. et al. (2005) *Int. Immunol.* 17, 749–758. (W)
- #2752 **Lck Antibody**: Hollmann, C.A. et al. (2006) *Cancer Res.* 66, 3550–3557. (W)
- #2731 **Phospho-Lyn (Tyr507) Antibody**: Nguyen, T.K. et al. (2006) *Clin. Cancer Res.* 12, 2239–2247. (W); Ogimoto, M. et al. (2004) *Int. Immunol.* 16, 971–982. (W)
- #2732 **Lyn Antibody**: Nguyen, T.K. et al. (2006) *Clin. Cancer Res.* 12, 2239–2247. (W)
- #2101 **Phospho-Src Family (Tyr416) Antibody**: Thelemann, A. et al. (2005) *Mol. Cell Proteomics* 4, 356–376. (W); White, D.E. et al. (2004) *Cancer Cell* 6, 159–170. (W, IF); Nagata, Y. et al. (2004) *Cancer Cell* 6, 117–127. (W); Gonfloni, S. et al. (2000) *Nat. Struct. Biol.* 7, 281–286. (W)
- #2105 **Phospho-Src (Tyr527) Antibody**: Oh, J. et al. (2006) *Oncogene* 25, 4230–4234. (W); Thelemann, A. et al. (2005) *Mol. Cell Proteomics* 4, 356–376. (W)
- #2107 **Non-phospho-Src (Tyr527) Antibody**: Shah, Y.M. et al. (2005) *Mol. Endocrinol.* 19, 732–748. (W)

**Non Receptor Tyrosine Kinases**

Non Receptor Tyrosine Kinases (NRTKs), like RTKs, are enzymes that catalyze the phosphorylation of tyrosine residues. However, they are localized to the cytoplasm or nucleus rather than bound to the membrane. The largest family within this group is the Src family of protein tyrosine kinases, which includes Src, Lyn, Fyn, Yes, Lck, Blk, and Hck and are important in the regulation of growth and differentiation of eukaryotic cells. Impaired immune response in cancer has been linked to aberrant signaling by this class of NRTKs.

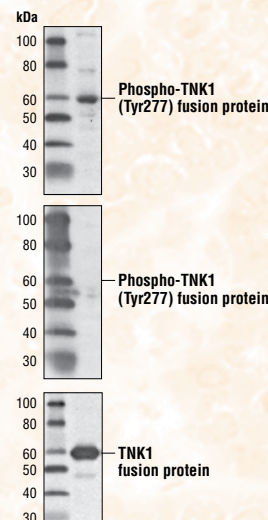


**Src (36D10) Rabbit mAb #2109**: IHC analysis of frozen SKOV-3 xenograft using #2109.

**TNK1**

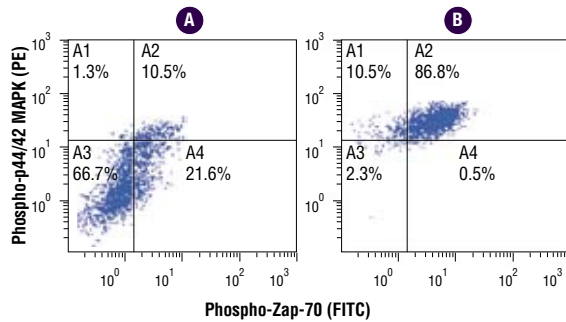
Tyrosine kinase non-receptor 1 (TNK1) is related to the Ack1 (TNK2) non receptor kinase that binds cdc42 and inhibits GTPase activity of this cell cycle regulator. TNK1 is broadly expressed in embryogenic tissues, but is restricted to select adult tissues. Phosphorylation of TNK1 on Tyr277 was identified at Cell Signaling Technology (CST) using PhosphoScan®, CST's LC-MS/MS platform for phosphorylation site discovery and also reported independently in another publication using MS technology. Phosphorylation of TNK1 at Tyr277 was observed in select carcinoma cell lines and in tumors. Visit PhosphoSitePlus® (PSP), CST's modification site

knowledgebase, for more information on this residue. More details on PSP are found on page 23.

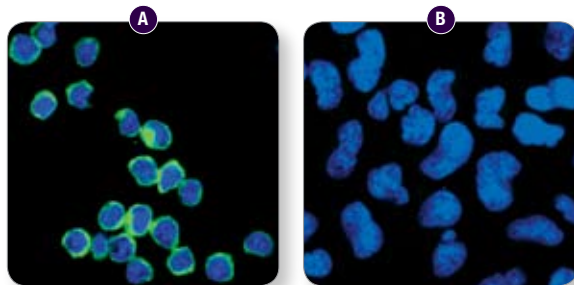


**Phospho-TNK1 (Tyr277) Antibody #4553 and TNK1 (C44F9) Rabbit mAb #4570**: Western blot analysis of extracts from L-540 cells using #4553 (upper and middle) or #4570 (lower). The middle membrane was treated with calf intestinal alkaline phosphatase (CIP) before antibody probing. L-540 cells express a 58 kDa TNK1-C17orf61 fusion protein containing 466 amino acids from the amino terminus of TNK1 [Gu, T.L. et al. (2010) *Leukemia*, 24, 861–865]. TNK1 kinase was constitutively activated in these cells.

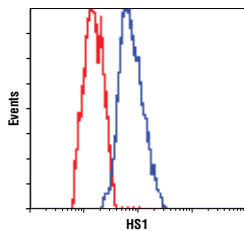
# Lymphocyte Signaling



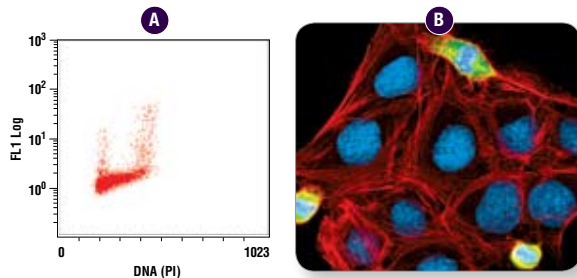
**Phospho-Zap-70 (Tyr319)/Syk (Tyr352) Antibody #2701:** Two-color flow cytometric analysis of Jurkat cells, untreated (A) or anti-CD3 activated (B), using #2701 and Phospho-p44/42 MAPK (Erk 1/2) (Thr202/Tyr204) (E10) mAb #9106. Anti-CD3 activation increases the intensity of label with both antibodies.



**HS1 (D83A8) XP™ Rabbit mAb (Human Specific) #3890:** Confocal IF analysis of Jurkat cells (A) and 293 cells (B) using #3890 (green). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).



**HS1 (D83A8) XP™ Rabbit mAb (Human Specific) #3890:** Flow cytometric analysis of MCF7 cells (red) and MOLT-4 cells (blue), using #3890.



**Phospho-TCTP (Ser46) Antibody #5251:** Flow cytometric analysis of Jurkat cells using #5251 compared to propidium iodide (DNA content, A). Confocal IF analysis of U-2 OS cells using #5251 (green). Actin filaments have been labeled with DY-554 phalloidin (red). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye) (B).

## Zap-70 and Syk

	Applications	Reactivity
#2715 Phospho-Syk (Tyr323) Antibody	W, IP	H, (M)
#2710 Phospho-Syk (Tyr525/526) (C87C1) Rabbit mAb	W, IP	H, (M, R)
#2711 Phospho-Syk (Tyr525/526) Antibody	W	H, (M, R)
#2712 Syk Antibody	W	H, M, (R)
#2717 Phospho-Zap-70 (Tyr319)/Syk (Tyr352) (65E4) Rabbit mAb	W	H, M
#2701 Phospho-Zap-70 (Tyr319)/Syk (Tyr352) Antibody	W, IP, IF-IC, F	H, M
#2704 Phospho-Zap-70 (Tyr493) Antibody	W, IP, F	H, (M, R)
#3165 Zap-70 (D1C10E) XP™ Rabbit mAb	W, IP, IF-F, F	H, M
#2705 Zap-70 (99F2) Rabbit mAb	W, IP, IHC-P, F	H, M
#2707 Zap-70 (136F12) Rabbit mAb (Alexa Fluor® 647 Conjugate)	F	H
#2709 Zap-70 (L1E5) Mouse mAb	W, IP	H

## Lymphocyte Adaptor Proteins

	Applications	Reactivity
#3601 Phospho-BLNK (Tyr96) Antibody	W, IP	H
#3587 BLNK Antibody	W, IP	H, M, R
<b>NEW</b> #3793 CIITA Antibody	W, IP	H
#4472 HPK1 Antibody	W, IP	H, M
#4507 Phospho-HS1 (Tyr397) Antibody	W, IP	H
<b>NEW</b> #3890 HS1 (D83A8) XP™ Rabbit mAb (Human Specific)	W, IP, IHC-P, IF-IC, F	H
<b>NEW</b> #3892 HS1 (D5A9) XP™ Rabbit mAb (Rodent Specific)	W, IP, IHC-P, F	M, R
#4503 HS1 Antibody (Human Specific)	W, IP, F	H
#4557 HS1 Antibody (Rodent Specific)	W, IP	M, R
#3581 Phospho-LAT (Tyr171) Antibody	W	H
#3584 Phospho-LAT (Tyr191) Antibody	W, IP	H
#9166 LAT Antibody	W, IP, IHC-P, F	H, M, (R)
<b>NEW</b> #5277 Phospho-LCP1 (Tyr28) Antibody	W	H
<b>NEW</b> #5350 LCP1 Antibody	W	H, M, (R)
#3812 LSP1 Antibody	W	H, M, R
<b>NEW</b> #2027 MCP-1 Antibody	W	H, (Mk)
<b>NEW</b> #2029 MCP-1 Antibody (Mouse Specific)	W, IP	M
<b>NEW</b> #4162 Myeloperoxidase (L607) Antibody	W, IP	H, M, R, (Mk)
<b>NEW</b> #4163 Myeloperoxidase (P733) Antibody	W	H, R, (Mk)
#9533 NTAL/LAB Antibody	W, IP	H
<b>NEW</b> #4301 p47phox (D21F6) Rabbit mAb	W	H
<b>NEW</b> #3923 p67phox Antibody	W	H, M, R
<b>NEW</b> #3968 RAG1 (D36B3) Rabbit mAb	W, IP	H
#2778 SH2D1A Antibody	W, IP	H
#2805 SH2D1A (XLP 1D12) Rat mAb	W, F	H
#4958 SLP-76 Antibody	W, IP, IHC-P	H, M
<b>NEW</b> #5251 Phospho-TCTP (Ser46) Antibody	W, IF-IC, F	H, M, R, Mk

### Selected Application References:

- #2715 Phospho-Syk (Tyr323) Antibody: Feldhahn, N. et al. (2005) *J. Exp. Med.* 201, 1837–1852. (W); Chan, S.M. et al. (2004) *Nat. Med.* 10, 1390–1396. (W)
- #2711 Phospho-Syk (Tyr525/526) Antibody: Mocsai, A. et al. (2004) *Proc. Natl. Acad. Sci. USA* 101, 6158–6163. (W); Chan, S.M. et al. (2004) *Nat. Med.* 10, 1390–1396. (W); Miah, S.M. et al. (2004) *Mol. Cell Biol.* 24, 71–83. (W); Saijo, K. et al. (2003) *Nat. Immunol.* 4, 274–279. (W)
- #2712 Syk Antibody: Feldhahn, N. et al. (2005) *J. Exp. Med.* 201, 1837–1852. (W); Tassioulas, I. et al. (2004) *Nat. Immunol.* 5, 1181–1189. (W)
- #2701 Phospho-Zap-70 (Tyr319)/Syk (Tyr352) Antibody: Brdicka, T. et al. (2005) *Mol. Cell Biol.* 25, 4924–4933. (W); Chan, S.M. et al. (2004) *Nat. Med.* 10, 1390–1396. (W)
- #2704 Phospho-Zap-70 (Tyr493) Antibody: Brdicka, T. et al. (2005) *Mol Cell Biol.* 25, 4924–4933. (W)
- #2705 Zap-70 (99F2) Rabbit mAb: Nachbur, U. et al. (2006) *Blood* 107, 2790–2796. (W); Chan, S.M. et al. (2004) *Nat. Med.* 10, 1390–1396. (W)

## AID

	Applications	Reactivity
#4949 AID (30F12) Rabbit mAb	W, IP	H
#4975 AID (L7E7) Mouse mAb	W, IP	H, M, (R)
#4959 AID (EK2 5G9) Rat mAb	W, IHC-P	H

## Pim

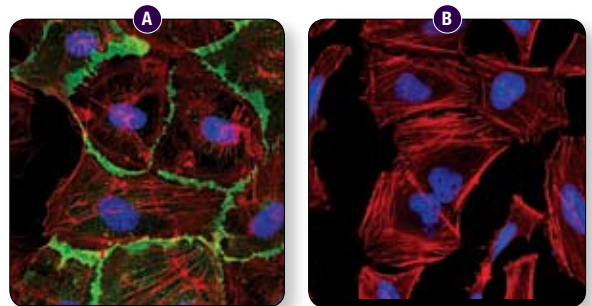
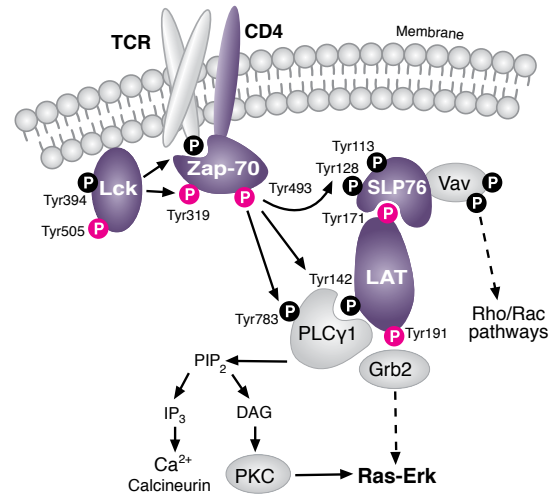
	Applications	Reactivity
<b>NEW</b> #3247 Pim-1 (C93F2) Rabbit mAb	W	H, M, (R, Mk, B)
#2907 Pim-1 Antibody	W, IP	H, (Mk)
#4730 Pim-2 (D1D2) XP™ Rabbit mAb	W, IP, IHC-P, IF-IC	H
<b>NEW</b> #4165 Pim-3 (D17C9) Rabbit mAb	W, IP	H, M, R, (Mk)

## Surface (CD) Marker Antibodies

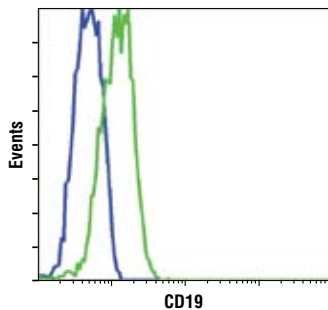
	Applications	Reactivity
#2135 CD2AP Antibody	W	H, M, R, Mk
#4443 CD3e (CD3-12) Rat mAb	W, IP, F	H, M, (Pg)
#3563 CD4 (Edu-2) Mouse mAb	F	H
#3572 CD8 (RIV11) Mouse mAb	F	H
#3565 CD10 (CB-CALLA) Mouse mAb	F	H
#3571 Phospho-CD19 (Tyr531) Antibody	W, IP	H
#3574 CD19 Antibody	W, IP, IF-IC, F	H, M
<b>NEW</b> #3528 CD31 (PECAM-1) (89C2) Mouse mAb	W, IP, IHC-P, IF-IC, F	H
#3568 CD31 (PECAM-1) (158-2B3) Mouse mAb	F	H
#3569 CD34 (IC0115) Mouse mAb	IHC-P, F	H
#3578 CD44 Antibody	W	H
<b>NEW</b> #5640 CD44 (8E2) Mouse mAb	W, IP, IF-IC, F	H, M, R
#3570 CD44 (156-3C11) Mouse mAb	W, IP, IHC-P, IF-IC, F	H
<b>NEW</b> #3516 CD44 (156-3C11) Mouse mAb (Alexa Fluor® 488 Conjugate)	IF-IC, F	H
#3575 CD45 (136-4B5) Mouse mAb	IHC-P, F	H
#4915 CD54 (ICAM-1) Antibody	W, IHC-P	H
#3576 CD56 (NCAM) (123C3) Mouse mAb	W, IHC-P, F	H
<b>NEW</b> #3351 CD79A Antibody	W, IHC-P, IF-IC	H

### Selected Application References:

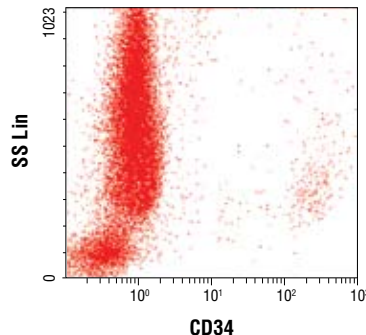
#3574 CD19 Antibody: Hentges, K.E. et al. (2005) *Oncogene* 24, 1220–1230. (W)



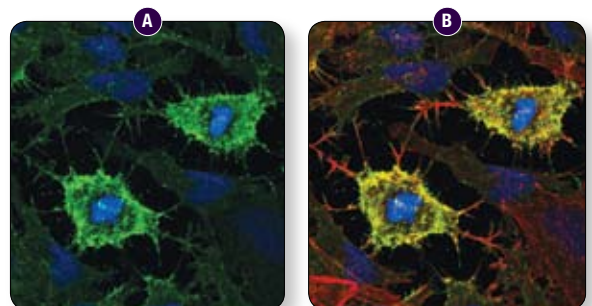
**CD31 (PECAM-1) (89C2) Mouse mAb #3528:** Confocal IF analysis of HUVEC (A) and HeLa cells (B) using #3528 (green). Actin filaments have been labeled with DY-554 phalloidin (red). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).



**CD19 Antibody #3574:** Flow cytometric analysis of Jurkat T cells (blue) and Ramos B cells (green) using #3574.

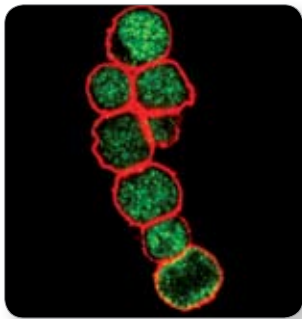


**CD34 (IC0115) Mouse mAb #3569:** Flow cytometric analysis of peripheral blood spiked with CD34+ Stem-Trol™ Control Cells using #3569.

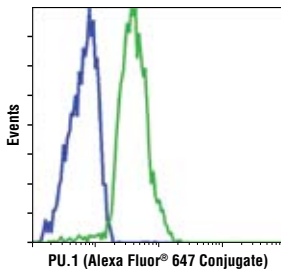


**CD44 (8E2) Mouse mAb #5640:** Projected confocal z-stack of HeLa cells using #5640 (green, A). Actin filaments have been labeled with DY-554 phalloidin (red, merge is shown in B). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).

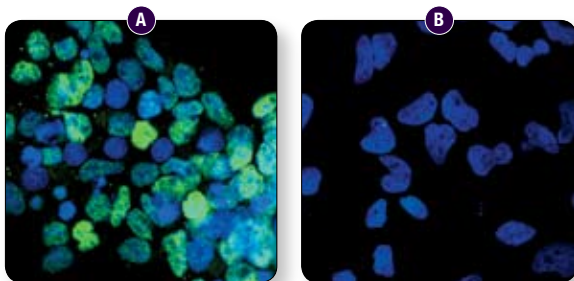
# Lymphocyte Signaling .....



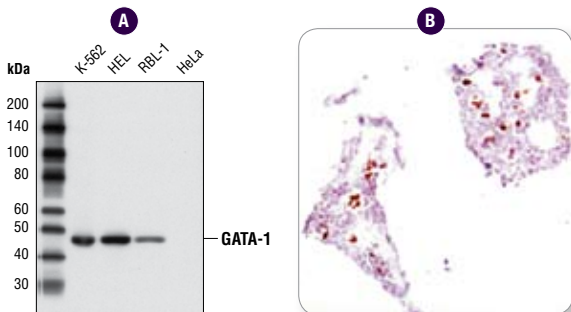
**AML1 (D33G6) XP™ Rabbit mAb #4336:** Confocal IF analysis of Jurkat cells using #4336 (green). Actin filaments have been labeled with DY-554 phalloidin (red).



**PU.1 (9G7) Rabbit mAb (Alexa Fluor® 647 Conjugate) #2240:** Flow cytometric analysis of MCF7 cells (blue) or THP-1 cells (green) using #2240.



**Blimp-1/PRDI-BF1 (C14A4) Rabbit mAb #9115:** Confocal IF analysis of SR cells (A) and HeLa cells (B) using #9115 (green). Blue pseudocolor = DRAQ5® #4084 (fluorescent DNA dye).



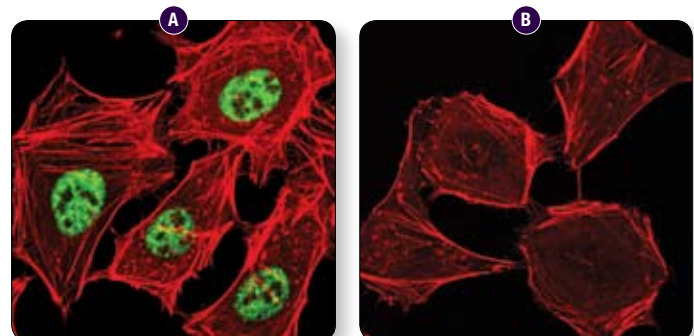
**GATA-1 (D52H6) XP™ Rabbit mAb #3535:** Western blot analysis of extracts from various cell lines using #3535 (A). IHC analysis of formalin-fixed paraffin-embedded undecalcified mouse bone using #3535 (B). Note staining of cells in the marrow.

## Transcription Factors & Nuclear Receptors

	Applications	Reactivity
#4327 Phospho-AML1 (Ser249) Antibody	W, IP, IF-IC, F	H
<b>NEW</b> #4336 AML1 (D33G6) XP™ Rabbit mAb	W, IP, IHC-P, IF-IC, F	H
#4334 AML1 Antibody	W, IF-IC, F	H, Mk
#4242 BCL6 Antibody	W	H, M, (R)
#9115 Blimp-1/PRDI-BF1 (C14A4) Rabbit mAb	W, IP, IF-IC	H, M, (Mk)
#4498 ETO Antibody	W	H, M, R, Mk
#2593 Evi-1 (C50E12) Rabbit mAb	W, IP, IF-IC, F	H
#2265 Evi-1 Antibody	W	H, (Dg)
<b>NEW</b> #4589 GATA-1 (D24E4) XP™ Rabbit mAb	W, IP, IF-IC, F	H
<b>NEW</b> #3535 GATA-1 (D52H6) XP™ Rabbit mAb	W, IP, IHC-P, IF-IC, F	H, M, R
#4591 GATA-1 Antibody	W, IP	H
#3753 JunB (C37F9) Rabbit mAb	W, IP, IHC-P, IF-IC	H, M, R, Mk
#2088 LEDGF (C57G11) Rabbit mAb	W, IHC-P, IF-IC, F	H, M, R, (Mk)
#2879 LITAF Antibody	W	H
<b>NEW</b> #4389 NFAT1 Antibody	W, IP, IF-IC	H, M, (R)
#2183 NFAT3 (23E6) Rabbit mAb	W	H, M, R
#2188 NFAT3 (31G6) Rabbit mAb	W, IP	H
#4998 NFAT4 Antibody	W, IP	H, (M)
#4342 Pbx1 Antibody	W, IP, IF-IC	H, M, (R)
#2258 PU.1 (9G7) Rabbit mAb	W, IP, IHC-P, IF-IC, F, ChIP	H, M, (Mk, Pg)
#2216 PU.1 (9G7) Rabbit mAb (Alexa Fluor® 488 Conjugate)	F	H, M, (Mk, Pg)
#2240 PU.1 (9G7) Rabbit mAb (Alexa Fluor® 647 Conjugate)	F	H, M, (Mk, Pg)
#2266 PU.1 Antibody	W, IP, IHC-P, IF-IC, F, ChIP	H, M, (Mk, Pg)
#2191 SRC-1 (128E7) Rabbit mAb	W, IP, IHC-P	H, M, R, Mk
<b>NEW</b> #2979 Phospho-SRC-3 (Thr24) Antibody	W, IF-IC	H
#2126 SRC-3 (5E11) Rabbit mAb	W, IP	H, M, R, Mk
<b>NEW</b> #2115 SRC-3 (11B1) Mouse mAb	W, IF-IC, F	H

## Effector Proteins

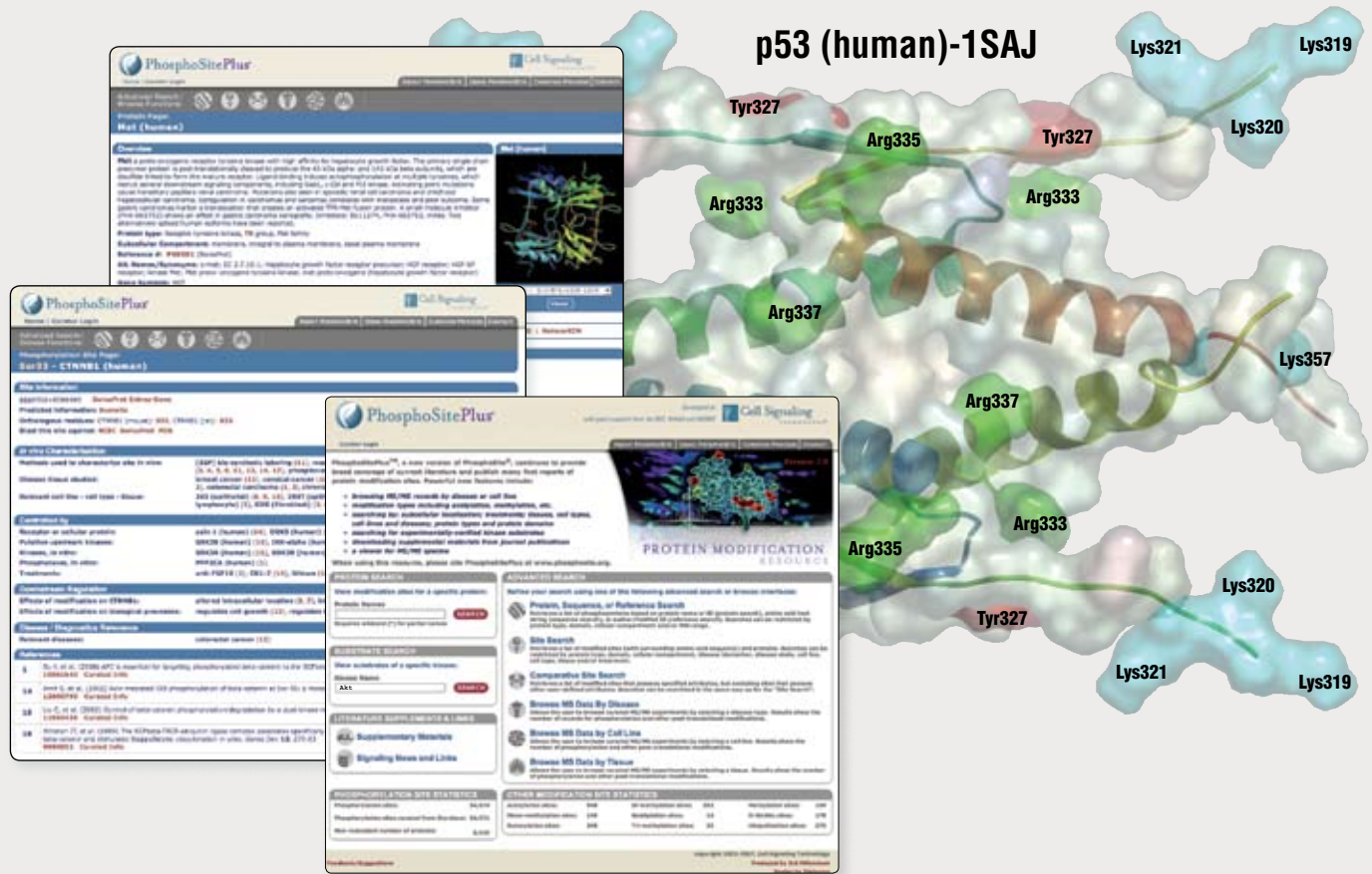
	Applications	Reactivity
#4928 Granzyme A Antibody	W, E-P	H
#4275 Granzyme B Antibody	W, E-P	H, M, R
#3693 Perforin Antibody (Mouse Specific)	W, IF-IC, F	M



**Phospho-SRC-3 (Thr24) Antibody #2979:** Confocal IF analysis of HeLa cells, untreated (A) or  $\lambda$ -phosphatase-treated (B), using #2979 (green). Actin filaments have been labeled with DY-554 phalloidin (red).

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