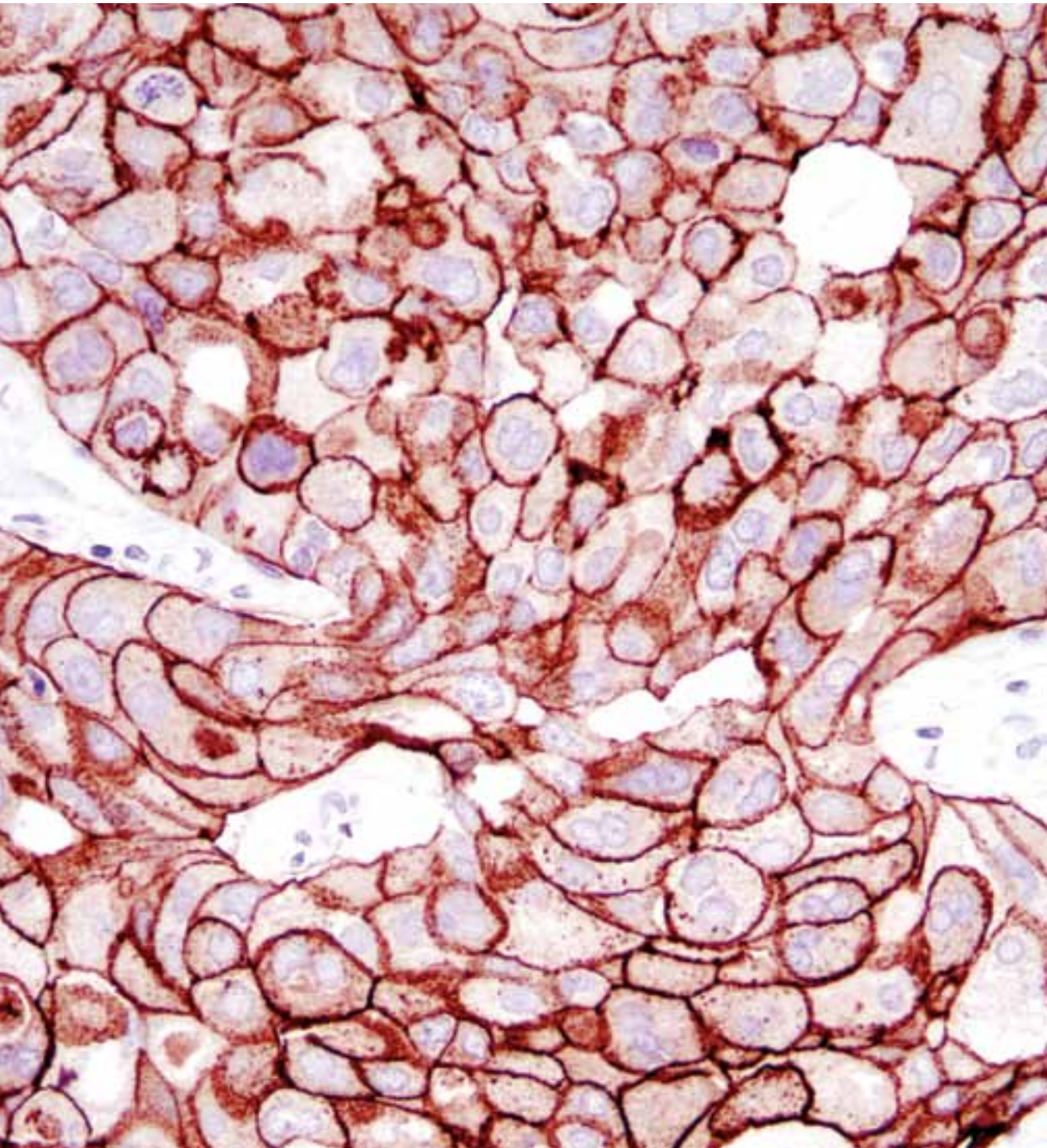




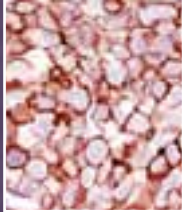
ANTIBODIES, KITS, AND REAGENTS FOR IMMUNOHISTOCHEMISTRY

Unparalleled Product Quality, Validation, and Technical Support



Cell Signaling

TECHNOLOGY®



Cover Image:
#4290 Her2/ErbB2 (D8F12)
XP™ Rabbit mAb (see page 5)

Antibodies, Kits, and Reagents for Immunohistochemistry

Cell Signaling Technology (CST) provides the highest quality activation-state and total protein antibodies available for use in immunohistochemistry (IHC). Our in-house IHC group has validated each IHC-recommended CST™ antibody and provides unparalleled technical support for these products.

- 4 Clinically Relevant Antibodies
- 6 **XP™ Monoclonal Antibodies**
- 8 Complementary Reagents, Kits, and Controls
- 10 Tyrosine Kinases
- 12 Immunology and Inflammation
- 13 MAP Kinase Signaling
- 14 PI3 Kinase/Akt Signaling
- 16 Cytoskeletal Regulation and Adhesion
- 18 Translational Control
- 20 Glucose and Energy Metabolism
- 21 Stem Cell Markers, Development, and Differentiation
- 22 Chromatin and Epigenetic Regulation
- 24 Cell Cycle, Checkpoint Control, and DNA Damage
- 25 Apoptosis and Autophagy
- 26 Neuroscience
- 27 Protein Folding and Stability
- 28 Post-translational Modification-Specific Motifs
- 28 Calcium, cAMP, and Lipid Signaling
- 29 Other Antibodies
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XP™ Monoclonal Antibodies

CST has developed a proprietary monoclonal method, XMT® technology, which allows for the production of XP™ monoclonal antibodies with the exceptional specificity, sensitivity, and reproducibility needed for the most accurate results in immunohistochemistry.

See page 6 for more information.

Application 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

Reactivity Key:
H human / **M** mouse / **R** rat / **Hm** hamster / **Mk** monkey
C chicken / **Mi** mink / **Dm** D. melanogaster / **X** Xenopus
Z zebra fish / **B** bovine / **Dg** dog / **Pg** pig / **Sc** S. cerevisiae
All all species expected / **()** 100% sequence homology

Antibody Validation for Immunohistochemistry

CST antibodies have been extensively validated by our in-house IHC group in tissue samples and clinically relevant mouse models. Target specificity for IHC analysis is determined through multiple validation steps. Our in-house IHC group uses a variety of approaches for each antibody validated for use in IHC to demonstrate that staining achieved with the antibody is specific and accurate.

Western Blot Analysis: CST antibodies are initially tested by western blot, and only antibodies that yield clear bands of the appropriate molecular weight with no significant additional cross-reacting bands are chosen for validation in applications such as IHC.

Paraffin-embedded Cell Pellets: Cells are subjected to treatments known to induce signaling changes to verify modification specificity (e.g. phosphorylation, acetylation, cleavage, etc.). To determine phospho-specificity of Phospho-Akt (Ser473) (D9E) XP™ Rabbit mAb #4060, LNCaP cells were treated with the PI3K inhibitor LY294002 #9901, which dramatically reduced signal as compared to the untreated cells, consistent with an expected loss of Akt phosphorylation with the treatment (**A**). Cell lines known to express or lack expression of the target of interest are used to verify specificity of antibodies recognizing total protein. Alternatively, cells can be treated to detect anticipated changes in localization of the target as compared to control, or siRNA can be used to block expression of the target. In figure (**A**), treatment of LNCaP cells with LY294002 #9901 shifted staining from the membrane to the cytoplasm as detected using Akt (pan) (C67E7) Rabbit mAb #4691.

Phosphatase Treatment: Treatment with phosphatase is used as an additional test to verify phospho-specificity of the antibody. As shown in (**B**), signal obtained using Phospho-EGF Receptor (Tyr1068) (D7A5) XP™ Rabbit mAb #3777 was completely ablated after treatment of the tissue with λ phosphatase.

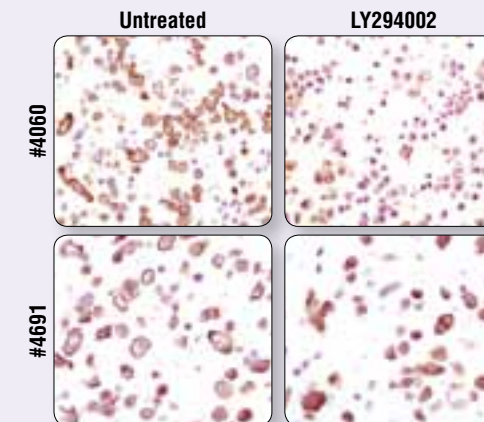
Tissue Arrays: Having stained cells consistently and appropriately in models with known target expression levels, antibodies can then be applied to arrays of human cancer tissues to assess performance over a broad spectrum of tissue types.

Xenografts: Xenografts generated from cell lines with known target expression levels are a valuable tool to verify target specificity of phospho-specific and total protein antibodies. Furthermore, when combined with a previously characterized drug treatment, these models can be used to show target modulation upon treatment.

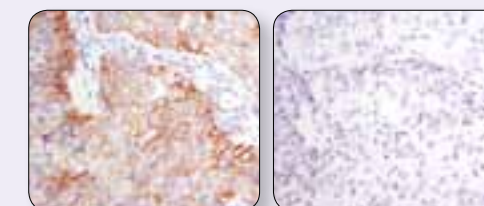
Blocking Peptides: Peptide blocking verifies sequence specificity of the phospho-specific or total protein antibody and rules out Fc receptor-mediated binding, staining associated with endogenous biotin, and other non-specific staining. As shown in (**C**), signal obtained using FoxP1 Antibody #2005 is blocked in the presence of antigen-specific peptide.

Mouse Models of Cancer: We routinely verify antibody performance in relevant mouse models of cancer. As shown in (**D**), tissues from WT and PTEN (-/-) mouse prostate were used to assess staining achieved using Phospho-Akt (Ser473) (D9E) XP™ Rabbit mAb #4060. The PTEN protein/lipid phosphatase is a negative regulator of the PI3K/Akt pathway that is often mutated or absent in various cancers. IHC analysis of the prostate from PTEN (-/-), but not WT mice shows strong staining using Phospho-Akt (Ser473) (D9E) XP™ Rabbit mAb #4060 indicating that the staining is specific and due to the lack of PTEN in the PTEN (-/-) mice.

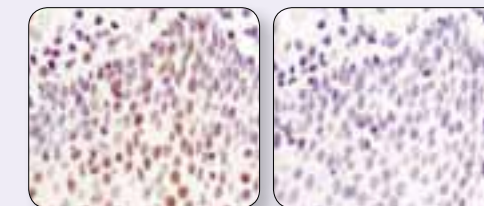
Apc (Min/+) mouse intestinal adenoma was used to assess staining obtained with β-Catenin Antibody (Carboxy-terminal Antigen) #9587 (**E**). This mouse strain is highly susceptible to spontaneous intestinal adenoma formation due to a mutation in adenomatous polyposis coli (APC). In the normal intestine, β-catenin resides at the membrane at adherens junctions; APC functions as a negative regulator of Wnt signaling by contributing to the destabilization of cytosolic β-catenin. In the intestinal adenoma, the cytoplasmic pool of β-catenin is stabilized and transported to the nucleus. Significant nuclear and cytoplasmic staining was observed in Apc (Min/+) mouse intestinal adenoma using β-Catenin Antibody (Carboxy-terminal Antigen) #9587, consistent with diminished APC.



A Phospho-Akt (Ser473) (D9E) XP™ Rabbit mAb #4060, Akt (pan) (C67E7) Rabbit mAb #4691: IHC analysis of SignalStain® Phospho-Akt (Ser473) IHC Control Slides #8101: LNCaP cells, untreated (left) or treated with LY294002 #9901 (right), using #4060 (top) and #4691 (bottom).



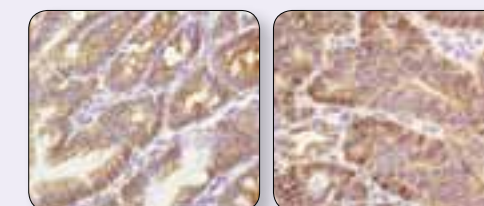
B Phospho-EGF Receptor (Tyr1068) (D7A5) XP™ Rabbit mAb #3777: IHC analysis of paraffin-embedded HCC827 xenograft, control (left) or λ phosphatase-treated (right), using #3777.



C FoxP1 Antibody #2005: IHC analysis of paraffin-embedded human tonsil epithelium in the presence of control peptide (left) or antigen-specific peptide (right), using #2005.



D 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.



E β-Catenin Antibody (Carboxy-terminal Antigen) #9587: IHC analysis of paraffin-embedded normal mouse intestine (left) and Apc (Min/+) mouse intestinal adenoma (right), using #9587.

Clinically Relevant Antibodies

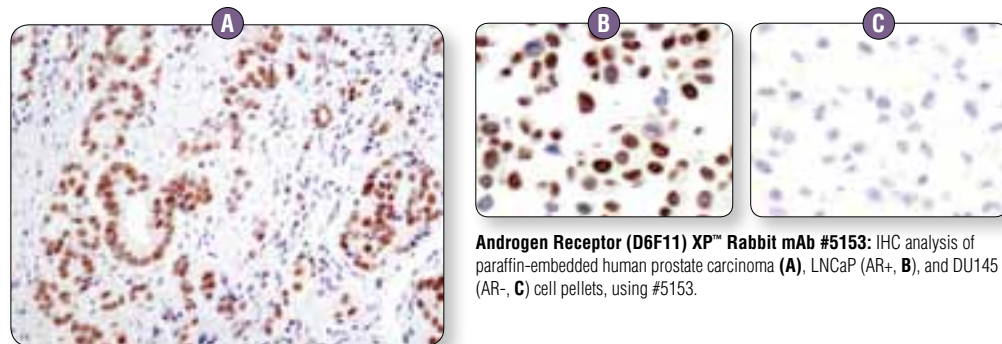
Many IHC-validated antibodies from Cell Signaling Technology are directed against proteins that play a critical role in affecting human diseases including cancer, diabetes, obesity, and immune disorders. Several of these antibodies have been validated using a shorter 2 hour incubation at 37°C, which gives the same results as the longer overnight incubation at 4°C. Please visit our website for optimal incubation conditions and recommendations specific for each product.

- #2855 Phospho-4E-BP1 (Thr37/46) (236B4) Rabbit mAb
- #9644 4E-BP1 (53H11) Rabbit mAb
- #3289 5-Lipoxygenase (C49G1) Rabbit mAb
- #4970 β -Actin (13E5) Rabbit mAb
- #3700 β -Actin (8H10D10) Mouse mAb
- #4060 Phospho-Akt (Ser473) (D9E) XP™ Rabbit mAb
- #4691 Akt (pan) (C67E7) Rabbit mAb
- #2938 Akt1 (C73H10) Rabbit mAb
- #4336 AML1 (D33G6) XP™ Rabbit mAb
- #3796 α -Amylase (D55H10) XP™ Rabbit mAb
- NEW #5153 Androgen Receptor (D6F11) XP™ Rabbit mAb
- #2087 Axin1 (C76H11) Rabbit mAb
- #2074 Axin1 (C95H11) Rabbit mAb
- NEW #5023 Bax (D2E11) Rabbit mAb
- #2774 Bax Antibody (Human Specific)
- #2764 Bcl-xL (54H6) Rabbit mAb
- #2933 Bim (C34C5) Rabbit mAb
- #4593 C-Peptide Antibody
- #3195 E-Cadherin (24E10) Rabbit mAb
- #2173 Calbindin (C26D12) Rabbit mAb
- #9661 Cleaved Caspase-3 (Asp175) Antibody
- #9582 β -Catenin (6B3) Rabbit mAb
- #9587 β -Catenin Antibody (Carboxy-terminal Antigen)
- #3267 Caveolin-1 (D46G3) XP™ Rabbit mAb
- #3528 CD31 (PECAM-1) (89C2) Mouse mAb
- #3569 CD34 (IC0115) Mouse mAb
- #3570 CD44 (156-3C11) Mouse mAb
- #3575 CD45 (136-4B5) Mouse mAb
- #4915 CD54 (ICAM-1) Antibody
- #3576 CD56 (NCAM) (123C3) Mouse mAb
- #3351 CD79A Antibody
- #3663 CD133 (C24B9) Rabbit mAb
- #3977 Cdx2 Antibody
- #2383 CEA/CD66e (CB30) Mouse mAb
- #2197 Phospho-Chk2 (Thr68) (C13C1) Rabbit mAb
- #4842 Cox2 Antibody

- #9198 Phospho-CREB (Ser133) (87G3) Rabbit mAb
- #9197 CREB (48H2) Rabbit mAb
- #2978 Cyclin D1 (92G2) Rabbit mAb
- #3777 Phospho-EGF Receptor (Tyr1068) (D7A5) XP™ Rabbit mAb
- #4407 Phospho-EGF Receptor (Tyr1173) (53A5) Rabbit mAb
- #4267 EGF Receptor (D38B1) XP™ Rabbit mAb
- #2085 EGF Receptor (E746-A750del Specific) (6B6) XP™ Rabbit mAb
- #3197 EGF Receptor (L858R Mutant Specific) (43B2) Rabbit mAb
- #2067 eIF4E (C46H6) Rabbit mAb
- #2929 EpCAM (VU1D9) Mouse mAb
- NEW #5246 Ezh2 (D2C9) XP™ Rabbit mAb
- #3145 Ezrin Antibody
- #4233 Fas (C18C12) Rabbit mAb
- #3180 Fatty Acid Synthase (C20G5) Rabbit mAb
- #4574 FGF Receptor 3 (C51F2) Rabbit mAb
- #2880 FoxO1 (C29H4) Rabbit mAb
- #3670 GFAP (GA5) Mouse mAb
- #2760 Glucagon Antibody
- #9323 Phospho-GSK-3 β (Ser9) (5B3) Rabbit mAb
- #2243 Phospho-HER2/ErbB2 (Tyr1221/1222) (6B12) Rabbit mAb
- #4290 HER2/ErbB2 (D8F12) XP™ Rabbit mAb
- #2165 HER2/ErbB2 (29D8) Rabbit mAb
- #4791 Phospho-HER3/ErbB3 (Tyr1289) (21D3) Rabbit mAb
- #2024 Hexokinase I (C35C4) Rabbit mAb
- #2867 Hexokinase II (C64G5) Rabbit mAb
- #9718 Phospho-Histone H2A.X (Ser139) (20E3) Rabbit mAb
- #9701 Phospho-Histone H3 (Ser10) Antibody
- #2401 Phospho-HSP27 (Ser82) Antibody
- #2402 HSP27 (G31) Mouse mAb
- #4876 HSP70 (D69) Antibody
- #4877 HSP90 (C45G5) Rabbit mAb
- #3027 IGF-1 Receptor β Antibody
- #3014 Insulin (C27C9) Rabbit mAb
- #3230 Jak2 (D2E12) XP™ Rabbit mAb
- #3753 JunB (C37F9) Rabbit mAb
- #4545 Pan-Keratin (C11) Mouse mAb

Androgen Receptor

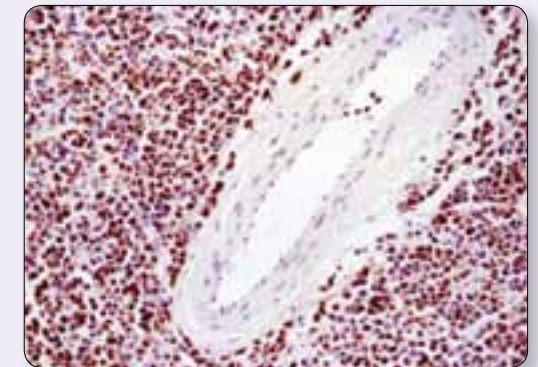
Androgen receptor (AR) is a nuclear receptor that localizes to the nucleus following phosphorylation and dimerization promoted by ligand binding, where it functions as a transcription factor in the regulation of gene expression. AR has been demonstrated to play a critical role in the development and progression of prostate cancer.



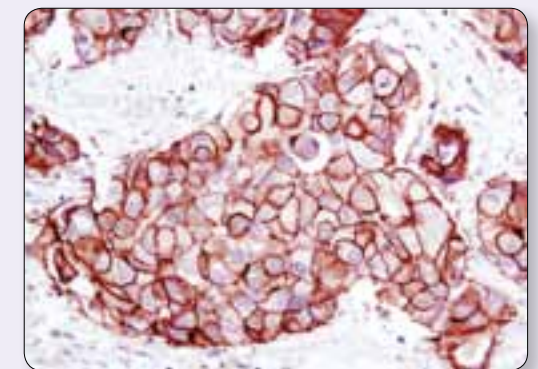
Androgen Receptor (D6F11) XP™ Rabbit mAb #5153: IHC analysis of paraffin-embedded human prostate carcinoma (A), LNCaP (AR+, B), and DU145 (AR-, C) cell pellets, using #5153.

- #4546 Keratin 8/18 (C51) Mouse mAb
- #3984 Keratin 17/19 (D32D9) XP™ Rabbit mAb
- #4548 Keratin 18 (DC10) Mouse mAb
- #4558 Keratin 19 (BA17) Mouse mAb
- #2984 Lck (D88) XP™ Rabbit mAb
- #3582 LDHA (C4B5) Rabbit mAb
- #3558 LDHA/LDHC (C28H7) Rabbit mAb
- #3007 Phospho-MAPKAPK-2 (Thr334) (27B7) Rabbit mAb
- #2338 Phospho-MEK1/2 (Ser221) (166F8) Rabbit mAb
- #3077 Phospho-Met (Tyr1234/1235) (D26) XP™ Rabbit mAb
- #3619 MCM2 (D7G11) XP™ Rabbit mAb
- #4012 MCM3 Antibody
- #3735 MCM7 (D10A11) XP™ Rabbit mAb
- #3249 Mic-1 (Y60) Antibody
- #3801 MMP-7 (D4H5) XP™ Rabbit mAb
- #3852 MMP-9 Antibody
- #2017 MSH2 (D24B5) XP™ Rabbit mAb
- #2976 Phospho-mTOR (Ser2448) (49F9) Rabbit mAb (IHC Specific)
- #4538 MUC1 (VU4H5) Mouse mAb
- #2837 Neurofilament-L (C28E10) Rabbit mAb
- NEW #3987 NF- κ B p65 (E498) Rabbit mAb
- #4764 NF- κ B p65 (C22B4) Rabbit mAb
- #3608 Notch1 (D1E11) XP™ Rabbit mAb
- #3542 NPM Antibody
- #3625 NUT (C52B1) Rabbit mAb
- #2890 Oct-4A (C52G3) Rabbit mAb
- #2947 p21 Waf1/Cip1 (12D1) Rabbit mAb
- #4511 Phospho-p38 MAPK (Thr180/Tyr182) (D3F9) XP™ Rabbit mAb
- #4370 Phospho-p44/42 MAPK (Erk1/2) (Thr202/Tyr204) (D13.14.4E) XP™ Rabbit mAb
- #2527 p53 (7F5) Rabbit mAb
- NEW #5625 Cleaved-PARP (Asp214) (D64E10) XP™ Rabbit mAb
- #2586 PCNA (PC10) Mouse mAb
- #9535 PDCD4 (D29C6) XP™ Rabbit mAb
- NEW #5241 PDGF Receptor α (D13C6) XP™ Rabbit mAb
- #3174 PDGF Receptor α (D1E1E) XP™ Rabbit mAb
- #4564 PDGF Receptor β (C82A3) Rabbit mAb
- #4249 PI3 Kinase p110 α (C73F8) Rabbit mAb
- #4053 PKM2 (D78A4) XP™ Rabbit mAb
- #2435 PPAR γ (C26H12) Rabbit mAb
- #2997 Phospho-PRAS40 (Thr246) (C77D7) Rabbit mAb
- #2691 PRAS40 (D23C7) XP™ Rabbit mAb
- #3153 Progesterone Receptor A/B (C89F7) Rabbit mAb
- #3157 Progesterone Receptor B (C1A2) Rabbit mAb
- #3409 PSD95 (D74D3) XP™ Rabbit mAb
- #9188 PTEN (D4.3) XP™ Rabbit mAb
- #9559 PTEN (138G6) Rabbit mAb
- #3205 Pyruvate Dehydrogenase (C54G1) Rabbit mAb
- #9309 Rb (4H1) Mouse mAb
- #4858 Phospho-S6 Ribosomal Protein (Ser235/236) (D57.2.2E) XP™ Rabbit mAb
- NEW #5364 Phospho-S6 Ribosomal Protein (Ser240/244) (D68F8) XP™ Rabbit mAb
- #2217 S6 Ribosomal Protein (5G10) Rabbit mAb
- #2317 S6 Ribosomal Protein (54D2) Mouse mAb
- #4668 Phospho-SAPK/JNK (Thr183/Tyr185) (81E11) Rabbit mAb
- #2093 SCF (C19H6) Rabbit mAb
- #9585 Slug (C19G7) Rabbit mAb
- #3579 Sox2 (D6D9) XP™ Rabbit mAb
- #2109 Src (36D10) Rabbit mAb
- #2191 SRC-1 (128E7) Rabbit mAb
- #9167 Phospho-Stat1 (Tyr701) (58D6) Rabbit mAb
- #9145 Phospho-Stat3 (Tyr705) (D3A7) XP™ Rabbit mAb
- #4113 Phospho-Stat3 (Tyr705) (M9C6) Mouse mAb
- #9359 Phospho-Stat5 (Tyr694) (C11C5) Rabbit mAb
- NEW #4191 Phospho-Stathmin (Ser38) (D19H10) Rabbit mAb
- #3352 Stathmin Antibody

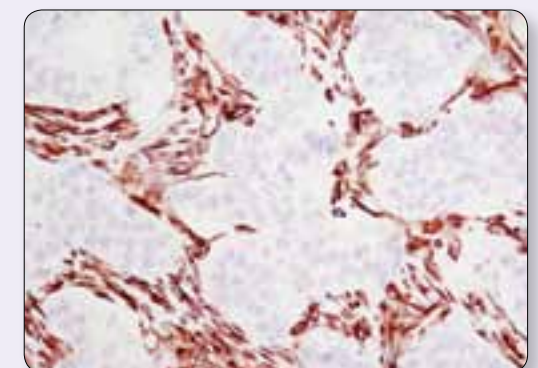
- #2808 Survivin (71G4B7) Rabbit mAb
- #4179 α -Synuclein (D37A6) XP™ Rabbit mAb
- #2647 α -Synuclein (Syn204) Mouse mAb
- #3557 TGM2 (D11A6) XP™ Rabbit mAb
- #3219 TRAIL (C92B9) Rabbit mAb
- #2508 TrkA (14G6) Rabbit mAb
- #4607 TrkB (80G2) Rabbit mAb
- #5666 β 3-Tubulin (D65A4) XP™ Rabbit mAb
- NEW #9319 Tyrosinase (T311) Mouse mAb
- #3933 Ubiquitin Antibody
- #2479 VEGF Receptor 2 (55B11) Rabbit mAb
- NEW #5741 Vimentin (D21H3) XP™ Rabbit mAb
- #4202 YB1 (D299) Antibody
- #2705 Zap-70 (99F2) Rabbit mAb



Ezh2 (D2C9) XP™ Rabbit mAb #5246: IHC analysis of paraffin-embedded human lymphoma using #5246.



HER2/ErbB2 (D8F12) XP™ Rabbit mAb #4290: IHC analysis of paraffin-embedded human breast carcinoma using #4290.



Vimentin (D21H3) XP™ Rabbit mAb #5741: IHC analysis of paraffin-embedded human breast carcinoma using #5741.

XP™ Monoclonal Antibodies

XP™ Monoclonal Antibodies are a line of high quality rabbit monoclonal antibodies exclusively available from Cell Signaling Technology (CST). Any product labeled with XP has been carefully selected based on superior performance in all approved applications.

These antibodies are generated using XMT® technology, a proprietary monoclonal method developed at CST. The technology provides 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 technology combined with our stringent quality control ensures maximum lot-to-lot consistency and the most reproducible results.

= eXceptional Performance™

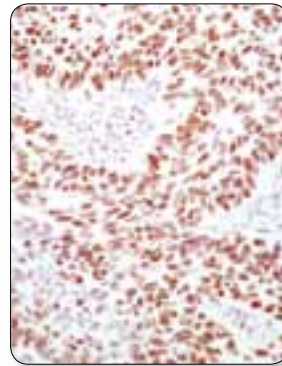
XMT technology coupled with our extensive antibody validation and stringent quality control delivers XP monoclonal antibodies with eXceptional Performance in the widest range of applications.

Visit our website for more experimental details, additional information, and a complete list of available XP monoclonal antibodies.

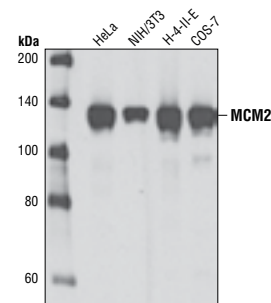
MCM2 (D7G11) XP™ Rabbit mAb #3619

is an example of an antibody with superior performance in a wide range of tested applications.

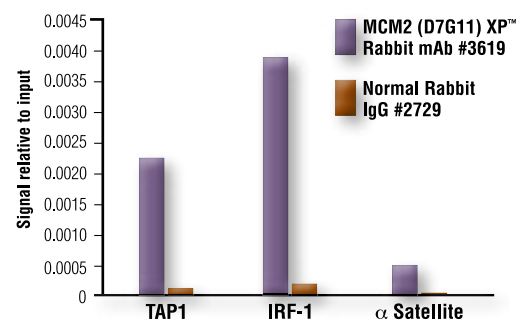
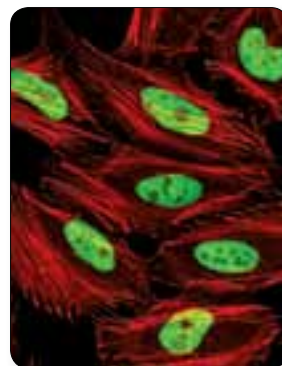
IHC analysis of paraffin-embedded human lung carcinoma using #3619.



WB analysis of extracts from various cell lines using #3619.



Confocal IF analysis of HeLa cells using #3619 (green). Actin filaments were labeled with DY-554 phalloidin (red).



Chromatin IPs were performed with cross-linked chromatin from 4×10^6 HT-1080 cells treated with IFN- γ (50 ng/ml) for 30 minutes, and either 20 μ l of #3619 or 2 μ 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 SimpleChIP® Human TAP1 Promoter Primers #5148, human IRF-1 promoter primers, and SimpleChIP® Human α Satellite Repeat Primers #4486. 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.

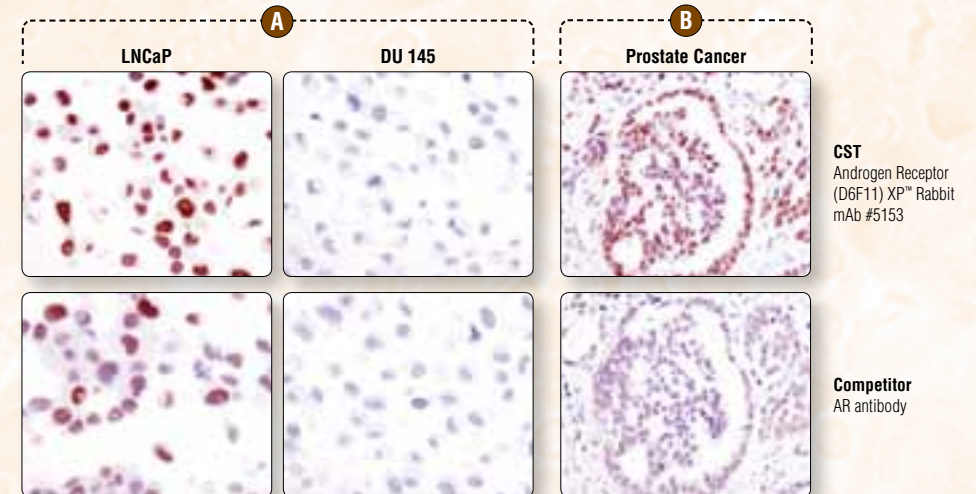
XP™ Monoclonal Antibody Validation and Competitor Comparison

XP monoclonal antibodies are generated using XMT technology. This technology provides access to a broad-range of antibody producing B cells, enabling the development of XP monoclonal antibodies with the exceptional specificity, sensitivity, and reproducibility necessary for the most accurate results in immunohistochemical analysis.

We compared XP monoclonal antibodies directed against Androgen Receptor and Akt phosphorylated at Ser473 to IHC-recommended antibodies offered by competitors. The optimal dilution for each antibody was individually determined using a paraffin-embedded cell pellet system, which includes a known positive and negative sample. A serial dilution was performed, and the optimal dilution was set at the concentration that yielded the strongest signal from the positive sample with minimum background staining in the negative sample. These dilutions were then used on human cancer tissue of known target expression. For both Androgen Receptor and Phospho-Akt antibodies, the resulting specific staining was much stronger using XP monoclonal antibodies.

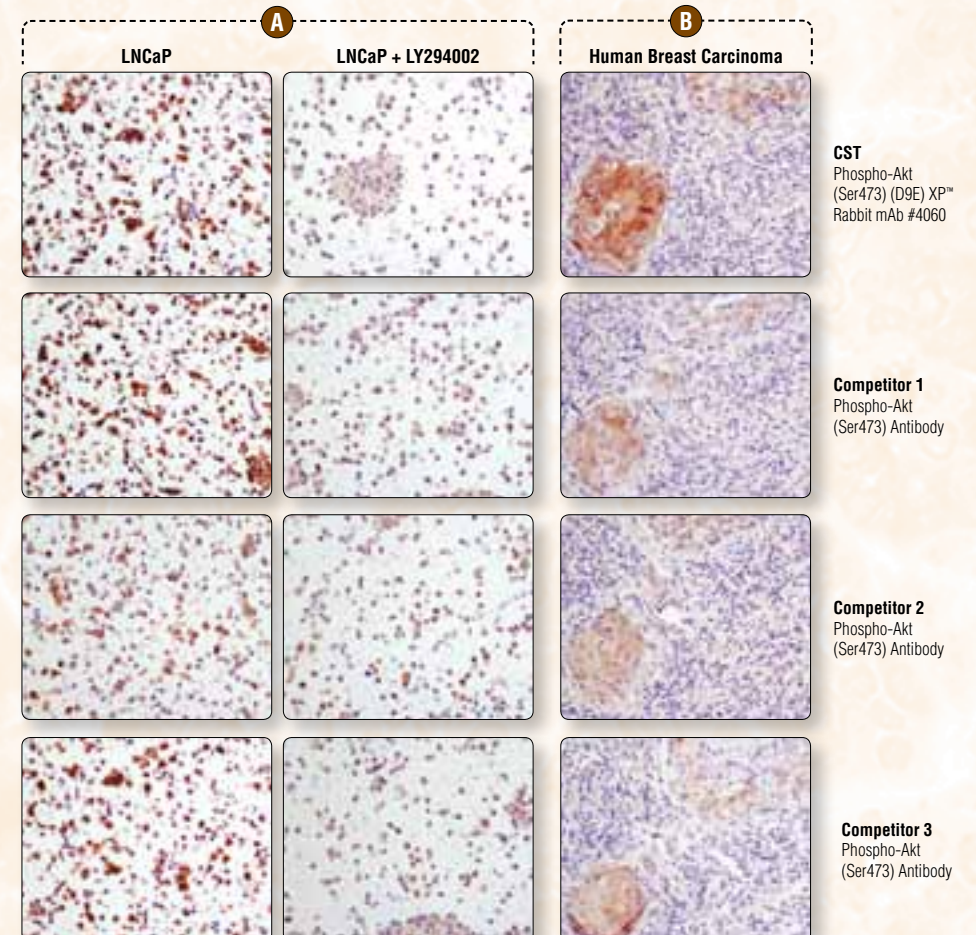
Androgen Receptor (D5F11) XP™ Rabbit mAb #5153

was compared to a competitor's IHC-approved Androgen Receptor antibody. The optimal dilution of each antibody was individually evaluated to maximize specific signal in LNCaP cells (AR positive, left) and minimize background non-specific signal in DU 145 cells (AR negative, right) (A). The determined optimal dilution was utilized in IHC analysis of paraffin-embedded human prostate carcinoma (B). Note stronger staining of XP monoclonal antibody.



Phospho-Akt (Ser473) (D9E) XP™ Rabbit mAb #4060

was compared to three competitors' IHC-approved Phospho-Akt (Ser473) antibodies. The optimal dilution of each antibody was individually evaluated to maximize specific signal in untreated LNCaP cells (left) and minimize background non-specific signal in LNCaP cells treated with LY294002 (PI3 Kinase Inhibitor) #9901 (right) (A). The determined optimal dilution for each antibody was utilized in IHC analysis of paraffin-embedded human breast carcinoma (B). Note stronger staining of XP monoclonal antibody.



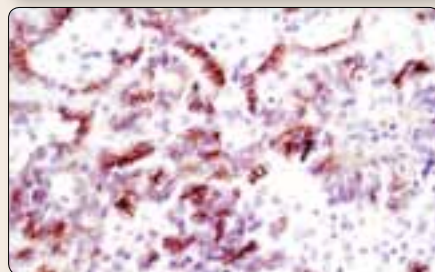
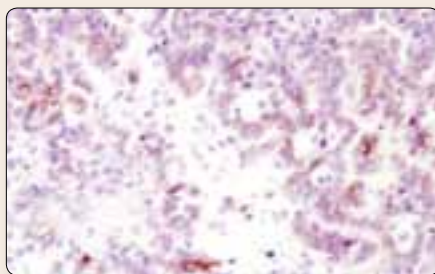
Complementary Reagents, Kits, and Controls for Immunohistochemistry

SignalStain® Boost IHC Detection Reagents

These polymer-based detection reagents were developed to enhance sensitivity and eliminate complications arising from false positive staining due to endogenous biotin. Both products offer a one-step, highly sensitive alternative to traditional immunohistochemistry (IHC) detection methods. SignalStain® Boost IHC Detection Reagents are specific to either rabbit or mouse IgG, can be used to visualize targets in both paraffin-embedded and frozen tissue, and are compatible with all peroxidase-based substrates.

SignalStain® Boost IHC Detection Reagent offers several advantages over conventional ABC detection methods:

- Superior sensitivity, resulting in a stronger signal and greater confidence in your results.
- A reduced number of steps in the detection procedure, saving valuable time.
- Less false positives resulting from endogenous biotin staining, providing a lower overall background.



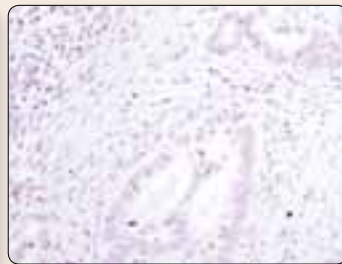
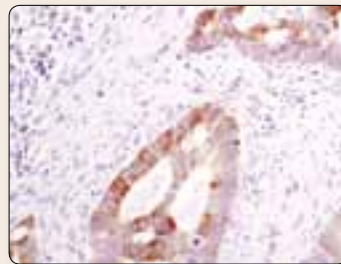
SignalStain® Boost IHC Detection Reagent (HRP, Rabbit)
#8114: IHC analysis of paraffin-embedded human papillary renal cell carcinoma using Phospho-Met (Tyr1234/1235) (D26) XP™ Rabbit mAb #3077 with biotin-based detection (top) or #8114 (bottom).

#8114 SignalStain® Boost IHC Detection Reagent (HRP, Rabbit)

#8125 SignalStain® Boost IHC Detection Reagent (HRP, Mouse)

Isotype Controls

Isotype control antibodies are used to estimate the non-specific binding of primary antibodies due to Fc receptor binding or other protein-protein interactions and should have the same immunoglobulin type as the test antibody. Rabbit (DA1E) mAb IgG XP™ Isotype Control #3900 is not directed against any known antigen and functions as an isotype control for rabbit IgG monoclonal antibodies.



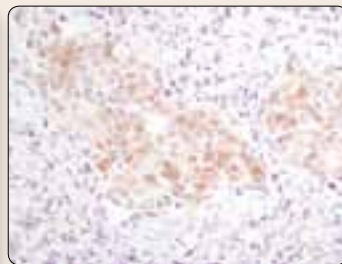
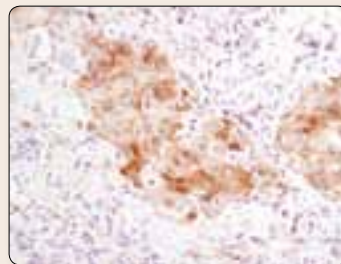
Rabbit (DA1E) mAb IgG XP™ Isotype Control #3900: IHC analysis of paraffin-embedded human colon carcinoma using Phospho-S6 Ribosomal Protein (Ser235/236) (D57.2.2E) XP™ Rabbit mAb #4858 (left) compared to #3900 (right) at a matched concentration.

	Applications
#3900 Rabbit (DA1E) mAb IgG XP™ Isotype Control XP	IHC-P, IF-IC, F
#5415 Mouse (G3A1) mAb IgG1 Isotype Control	IP, IHC-P, IF-IC, F, ChIP

SignalStain® Diluent

SignalStain® Antibody Diluent #8112 yields superior staining with many of our IHC-validated antibodies. Please see product datasheets for diluent recommendations or visit the Antibody Diluent Table on our website.

SignalStain® Antibody Diluent #8112: IHC analysis ▶ of paraffin-embedded human breast carcinoma comparing #8112 (left) and TBST with 5% normal goat serum (right) using Phospho-Akt (Ser473) (D9E) XP™ Rabbit mAb #4060.



SignalStain® IHC Sampler Kits

SignalStain® IHC Sampler Kits contain antibodies that are extensively validated for use in immunohistochemical assays using multiple approaches. The kits contain a selection of primary antibodies, SignalStain® Antibody Diluent, as well as control slides that can be used to verify the performance of each antibody.

#8107 SignalStain® Akt Pathway IHC Sampler Kit

Phospho-Akt (Ser473) (D9E) XP™ Rabbit mAb #4060, Akt (pan) (C67E7) Rabbit mAb #4691, PTEN (D4.3) XP™ Rabbit mAb #9188, Phospho-S6 Ribosomal Protein (Ser235/236) (D57.2.2E) XP™ Rabbit mAb #4858, SignalStain® Antibody Diluent #8112, Akt Family IHC Controls

#8111 SignalStain® Phospho-ErbB Family IHC Sampler Kit

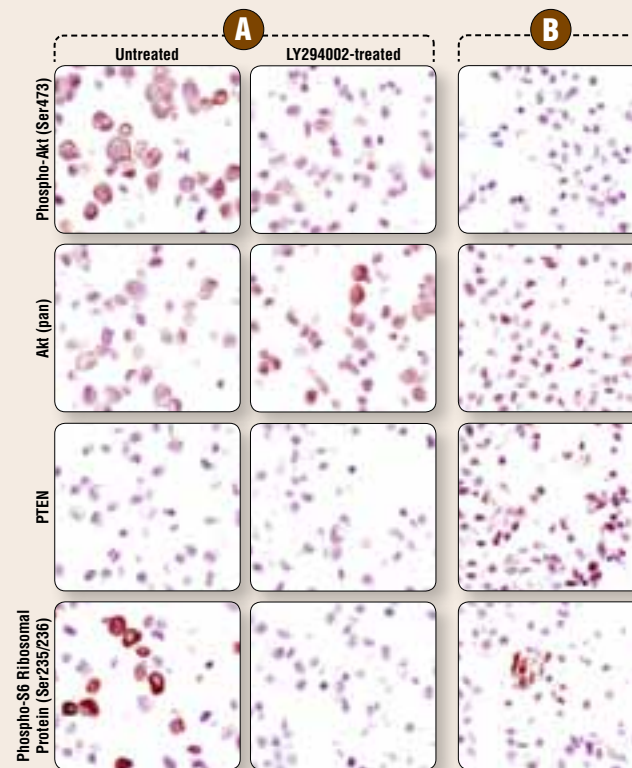
Phospho-EGF Receptor (Tyr1173) (53A5) Rabbit mAb #4407, Phospho-HER2/ErbB2 (Tyr1221/1222) (6B12) Rabbit mAb #2243, Phospho-HER3/ErbB3 (Tyr1289) (21D3) Rabbit mAb #4791, EGF Receptor (D38B1) XP™ Rabbit mAb #4267, SignalStain® Antibody Diluent #8112, SignalSlide® Phospho-ErbB Family IHC Controls #8117

#8113 SignalStain® Phospho-Stat IHC Sampler Kit

Phospho-Stat1 (Tyr701) (58D6) Rabbit mAb #9167, Phospho-Stat3 (Tyr705) (D3A7) XP™ Rabbit mAb #9145, Phospho-Stat5 (Tyr694) (C11C5) Rabbit mAb #9359, SignalStain® Antibody Diluent #8112, SignalSlide® Phospho-Stat1/3/5 IHC Controls #8105

#8109 SignalStain® Proliferation/Apoptosis IHC Sampler Kit

Cleaved Caspase-3 (Asp175) Antibody #9661, Phospho-Histone H3 (Ser10) Antibody #9701, PCNA (PC10) Mouse mAb #2586, Survivin (71G4B7) Rabbit mAb #2808, SignalStain® Antibody Diluent #8112, SignalSlide® Cleaved Caspase-3 (Asp175) IHC Controls #8104



SignalStain® Akt Pathway IHC Sampler Kit #8107: IHC analysis of paraffin-embedded LNCaP (A) cell pellets, either untreated (left) or treated with LY294002 #9901 (right), or NIH/3T3 cell pellets (B), using Phospho-Akt (Ser473) (D9E) XP™ Rabbit mAb #4060, Akt (pan) (C67E7) Rabbit mAb #4691, PTEN (D4.3) XP™ Rabbit mAb #9188, and Phospho-S6 Ribosomal Protein (Ser235/236) (D57.2.2E) XP™ Rabbit mAb #4858.

SignalSlide® IHC Controls

Formalin-fixed, paraffin-embedded cell pellet control slides are available for many of our IHC-approved antibodies. Each slide contains a negative and positive pellet, and each set contains five slides. Custom control slides are available upon request. Please contact technical support with any questions.

#8101 SignalSlide® Phospho-Akt (Ser473) IHC Controls

For use with Antibodies: 2211, 2217, 2317, 2691, 2855, 2920, 2938, 2997, 3787, 4060, 4685, 4691, 4857, 4858, 5196, 5364, 5482, 9323, 9644

#8104 SignalSlide® Cleaved Caspase-3 (Asp175) IHC Controls

For use with Antibodies: 2035, 5625, 8109, 9541, 9661, 9662, 9664

#8102 SignalSlide® Phospho-EGF Receptor IHC Controls

For use with Antibodies: 2234, 2235, 2236, 2237, 3777, 4267, 4404, 4407, 9411, 9416, 9417

NEW #8117 SignalSlide® Phospho-ErbB Family IHC Controls

For use with Antibodies: 2165, 2242, 2243, 3777, 4267, 4290, 4407, 4791, 8111

NEW #8118 SignalSlide® Phospho-Met (Tyr1234/1235) IHC Controls

For use with Antibody: 3077

#8103 SignalSlide® Phospho-p44/42 MAPK (Thr202/Tyr204) IHC Controls

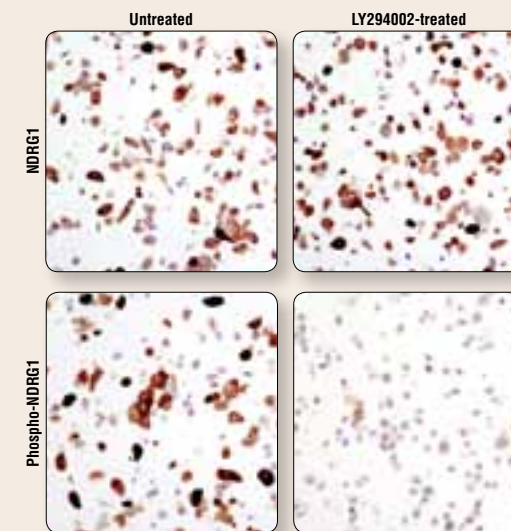
For use with Antibodies: 4370, 4376, 4695, 4696, 9102

#8106 SignalSlide® PTEN IHC Control Slides

For use with Antibodies: 9188, 9559

#8105 SignalSlide® Phospho-Stat1/3/5 IHC Controls

For use with Antibodies: 4113, 4904, 8113, 9132, 9139, 9314, 9359, 9145, 9167, 9175

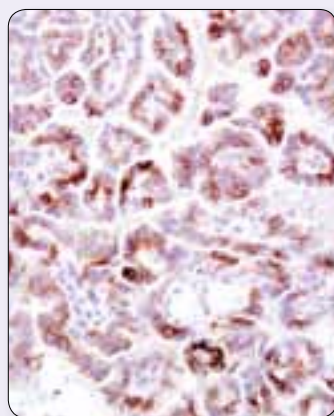


SignalSlide® Phospho-Akt (Ser473) IHC Controls #8101: IHC analysis on #8101 [paraffin-embedded LNCaP cell pellets, untreated (left) or treated with LY294002 #9901 (right)] using NDRG1 Antibody #5196 (top) or Phospho-NDRG1 (Thr346) (D98G11) XP™ Rabbit mAb #5482 (bottom).

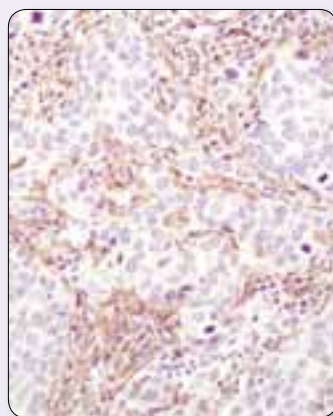
Please visit the Immunohistochemistry section at our website for the most updated information on recommended diluents, detection reagents, and controls.

Tyrosine Kinases

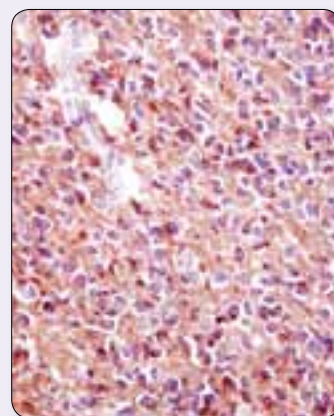
	Applications	Reactivity
#3901 Phospho-Bcr (Tyr177) Antibody	W, IHC-P, F	H, M
#2235 Phospho-EGF Receptor (Tyr992) Antibody	W, IHC-P	H, (R)
#2237 Phospho-EGF Receptor (Tyr1045) Antibody	W, IHC-P, IF-IC	H, R
#3777 Phospho-EGF Receptor (Tyr1068) (D7A5) XP™ Rabbit mAb	W, IHC-P, IF-IC, F	H, M, R, Mk
#2234 Phospho-EGF Receptor (Tyr1068) Antibody	W, IHC-P	H, M, R
#2236 Phospho-EGF Receptor (Tyr1068) (1H12) Mouse mAb	W, IP, IHC-P	H, R, Mk
#4404 Phospho-EGF Receptor (Tyr1148) Antibody	W, IHC-P	H, Mk, (R)
#4407 Phospho-EGF Receptor (Tyr1173) (53A5) Rabbit mAb	W, IP, IHC-P	H, M, R
#2085 EGF Receptor (E746-A750del Specific) (6B6) XP™ Rabbit mAb	W, IP, IHC-P, IF-IC, IF-P, F	H
#3197 EGF Receptor (L858R Mutant Specific) (43B2) Rabbit mAb	W, IP, IHC-P, IF-IC, IF-P, F	H
#4267 EGF Receptor (D38B1) XP™ Rabbit mAb	W, IP, IHC-P, IF-IC, F	H, M, Mk
#3285 FAK Antibody	W, IP, IHC-P	H, M, R, Mk, B, Pg, (C)
#4574 FGF Receptor 3 (C51F2) Rabbit mAb	W, IP, IHC-P, IF-IC	H
#3462 FLT3 (8F2) Rabbit mAb	W, IP, IHC-P	H, M
#8111 SignalStain® Phospho-ErbB Family IHC Sampler Kit	IHC-P	
#2243 Phospho-HER2/ErbB2 (Tyr1221/1222) (6B12) Rabbit mAb	W, IHC-P, IHC-F	H
#4290 HER2/ErbB2 (D8F12) XP™ Rabbit mAb	W, IHC-P	H, (M, R)
#2165 HER2/ErbB2 (29D8) Rabbit mAb	W, IP, IHC-P, IHC-F, IF-IC, F	H, (M, R)
#2242 HER2/ErbB2 Antibody	W, IHC-P	H
#4791 Phospho-HER3/ErbB3 (Tyr1289) (21D3) Rabbit mAb	W, IP, IHC-P	H, (M, R, Dg)
#4792 HER4/ErbB4 (83B10) Rabbit mAb (IHC Specific)	W, IHC-P	H, (M)
#2984 Lck (D88) XP™ Rabbit mAb	W, IHC-P	H
#3155 Phospho-M-CSF Receptor (Tyr723) (49C10) Rabbit mAb	W, IP, IHC-P, F	H, M
#3077 Phospho-Met (Tyr1234/1235) (D26) XP™ Rabbit mAb	W, IP, IHC-P, IHC-F	H, M, R
#5241 PDGF Receptor α (D13C6) XP™ Rabbit mAb	W, IHC-P, IF-IC, F	H
#3174 PDGF Receptor α (D1E1E) XP™ Rabbit mAb	W, IP, IHC-P, IF-IC, F	H, M
#3164 PDGF Receptor α Antibody	W, IP, IHC-P, F	H, M, R
#4564 PDGF Receptor β (C82A3) Rabbit mAb	W, IHC-P, F	H, M, R
#3169 PDGF Receptor β (28E1) Rabbit mAb	W, IP, IHC-P, IHC-F, IF-IC	H, M, R
#2093 SCF (C19H6) Rabbit mAb	W, IHC-P, F	H
#2105 Phospho-Src (Tyr527) Antibody	W, IHC-P	H, M, R, (C)
#2109 Src (36D10) Rabbit mAb	W, IP, IHC-P, IHC-F, IF-F, IF-IC, F	H, M, R, Hm, Mk, B, Pg, (C)
#2108 Src Antibody	W, IP, IHC-P, IF-F, IF-IC, F	H, M, R, Mk, (C)
#4991 Phospho-VEGF Receptor 2 (Tyr951) (15D2) Rabbit mAb	W, IHC-P	H, M
#2478 Phospho-VEGF Receptor 2 (Tyr1175) (19A10) Rabbit mAb	W, IHC-P, IF-IC	H, M
#2479 VEGF Receptor 2 (55B11) Rabbit mAb	W, IP, IHC-P, IF-F, IF-IC, F	H, M
#2734 Yes Antibody	W, IHC-P	H, M
#2705 Zap-70 (99F2) Rabbit mAb	W, IP, IHC-P, F	H, M



Phospho-Met (Tyr1234/1225) (D26) XP™ Rabbit mAb #3077: IHC analysis of paraffin-embedded papillary renal cell carcinoma using #3077.



PDGF Receptor β (C82A3) Rabbit mAb #4564: IHC analysis of paraffin-embedded human lung carcinoma using #4564.



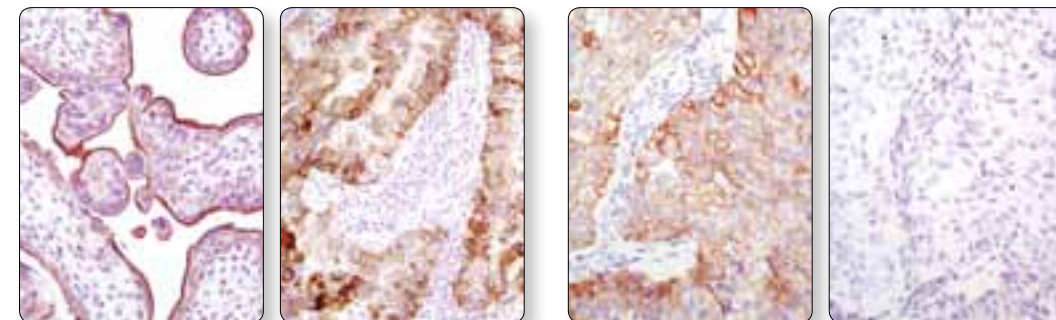
PDGF Receptor α (D13C6) XP™ Rabbit mAb #5241: IHC analysis of paraffin-embedded human astrocytoma using #5241.

Application References:
Phospho-Met (Tyr1234/1235) (D26) XP™ Rabbit mAb #3077: Benedettini, E. et al. (2010) Met activation in non-small cell lung cancer is associated with de novo resistance to EGFR inhibitors and the development of brain metastasis. *Am. J. Pathol.* 177, 415–423.

EGFR and Mutant EGFR

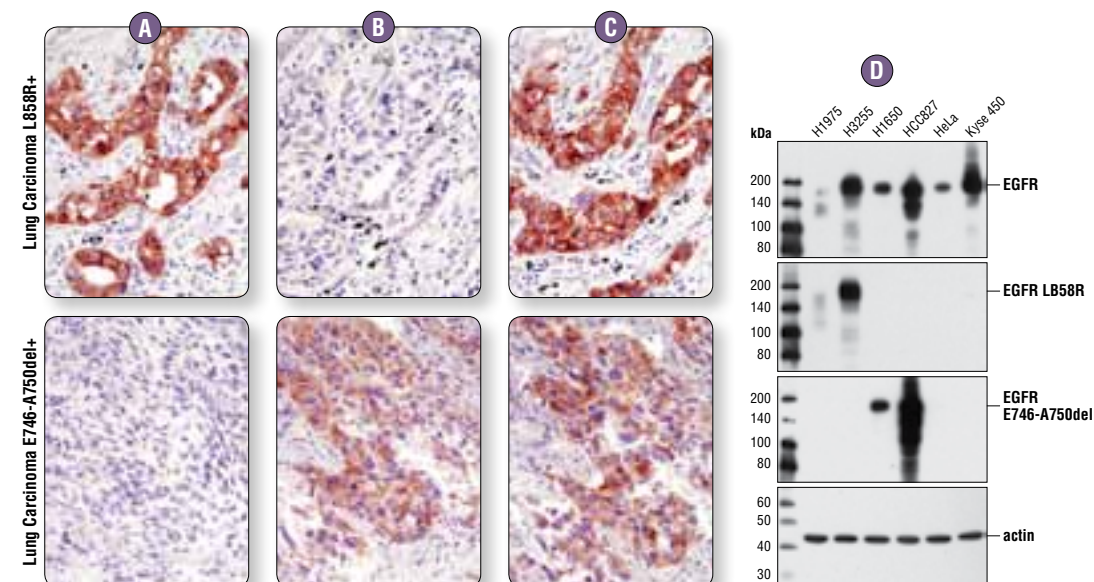
The epidermal growth factor receptor (EGFR) is a 170 kDa transmembrane tyrosine kinase that belongs to the HER/ErbB protein family. Ligand binding results in receptor dimerization, autophosphorylation, activation of downstream signaling, and internalization. The adaptor protein GRB2 binds activated EGFR phosphorylated at Tyr1068; this binding is necessary for the stimulation of EGFR-induced Ras/MAPK signaling.

Somatic mutations in the tyrosine kinase domain of EGFR are present in a subset of lung adenocarcinomas that respond to EGFR inhibitors, such as gefitinib and erlotinib. Two types of mutations account for approximately 90% of mutated cases: a specific point mutation L858R in exon 21 and short in-frame deletions in exon 19. The most frequent deletion is exon 19 E746-A750. Mutation-specific antibodies from Cell Signaling Technology (CST) allow the examination of tissues or cells with antibodies designed to detect these two common mutations in EGFR: the point mutation L858R and the mutant deletion in exon 19 (E746-A750). CST also offers the highest quality phospho- and total EGFR antibodies, to assess EGFR activity and total EGFR expression levels.



EGF Receptor (D38B1) XP™ Rabbit mAb #4267: IHC analysis of paraffin-embedded human placenta (left) and human lung carcinoma (right) using #4267.

Phospho-EGF Receptor (Tyr1068) (D7A5) XP™ Rabbit mAb #3777: IHC analysis of paraffin-embedded HCC827 xenograft, control (left) or λ-phosphatase-treated (right), using #3777.

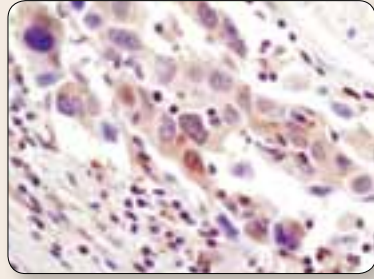


EGF Receptor (L858R Mutant-Specific) (43B2) Rabbit mAb #3197, EGF Receptor (E746-A750del Specific) (6B6) XP™ Rabbit mAb #2085, and EGF Receptor (D38B1) XP™ Rabbit mAb #4267: IHC analysis of paraffin-embedded human lung carcinoma of known mutational status using #3197 (A), #2085 (B), and #4267 (C). EGFR L858R positive lung (top); EGFR deletion positive lung (bottom). WB analysis of various EGFR expressing cell lines (D), showing the specificity of detection with #4267 (top), #3197 (upper middle), and #2085 (lower middle). β-actin (13E5) Rabbit mAb #4970 was used to confirm equal protein loading (bottom).

Application References:

EGF Receptor (E746-A750del Specific) (6B6) XP™ Rabbit mAb #2085 and EGF Receptor (L858R Mutant Specific) (43B2) Rabbit mAb #3197: Yu, J. et al. (2009) Mutation-specific antibodies for the detection of EGFR mutations in non-small-cell lung cancer. *Clin. Cancer Res.* 15, 3023–3028. / Brevet, M. et al. (2010) Assessment of EGFR mutation status in lung adenocarcinoma by immunohistochemistry using antibodies specific to the two major forms of mutant EGFR. *J. Mol. Diagn.* 12, 169–176. / Kato, Y. et al. (2010) Novel epidermal growth factor receptor mutation-specific antibodies for non-small cell lung cancer: immunohistochemistry as a possible screening method for epidermal growth factor receptor mutations. *J. Thorac. Oncol.* 5, 1551–1558. / Kawahara, A. et al. (2010) Molecular diagnosis of activating EGFR mutations in non-small cell lung cancer using mutation-specific antibodies for immunohistochemical analysis. *Clin. Cancer Res.* 16, 3163–3170. / Kitamura, A. et al. (2010) Immunohistochemical Detection of EGFR Mutation Using Mutation-Specific Antibodies in Lung Cancer. *Clinical Cancer Research* 16, 3349–3355. / Simonetti, S. et al. (2010) Detection of EGFR mutations with mutation-specific antibodies in stage IV non-small-cell lung cancer. *J. Transl. Med.* 8, 135.

Immunology and Inflammation



NF-κB p65 (E498) Antibody #3987: IHC analysis of paraffin-embedded human breast carcinoma using #3987.



RAGE 1 Antibody #4800: IHC analysis of paraffin-embedded human lung using #4800.

Application References:

NF-κB p65 (C22B4) Rabbit mAb #4764: Hideshima, T. et al. (2009) Biologic sequelae of IκB kinase (IKK) inhibition in multiple myeloma: therapeutic implications. *Blood* 113, 5228–5236.

Phospho-IκBα (Ser32/36) (5A5) Mouse mAb #9246: Wright, T. et al. (2007) Regulation of early wave of germ cell apoptosis and spermatogenesis by deubiquitinating enzyme CYLD. *Dev. Cell.* 5, 705–716.

Stat3 Antibody #9132: Peterson, W.M. et al. (2000) Ciliary neurotrophic factor and stress stimuli activate the Jak-STAT pathway in retinal neurons and glia. *J. Neurosci.* 20, 4081–4090.

	Applications	Reactivity
#4959 AID (EK2 5G9) Rat mAb	W, IHC-P	H
#4336 AML1 (D33G6) XP™ Rabbit mAb	XP W, IP, IHC-P, IF-IC, F	H
#3528 CD31 (PECAM-1) (89C2) Mouse mAb	W, IP, IHC-P, IF-IC, F	H
#3569 CD34 (IC0115) Mouse mAb	IHC-P, F	H
#3570 CD44 (156-3C11) Mouse mAb	W, IP, IHC-P, IF-IC, F	H
#3575 CD45 (136-4B5) Mouse mAb	IHC-P, F	H
#3351 CD79A Antibody	W, IHC-P, IF-IC	H
#4842 Cox2 Antibody	W, IHC-P	H, M, (R)
#4233 Fas (C18C12) Rabbit mAb	W, IHC-P	H
#3535 GATA-1 (D52H6) XP™ Rabbit mAb	XP W, IP, IHC-P, IF-IC, F	H, M, R
#3890 HS1 (D83A8) XP™ Rabbit mAb (Human Specific)	XP W, IP, IHC-P, IF-IC, F	H
#3892 HS1 (D5A9) XP™ Rabbit mAb (Rodent Specific)	XP W, IP, IHC-P, F	M, R
#9246 Phospho-IκBα (Ser32/36) (5A5) Mouse mAb	W, IP, IHC-P	H, M, R, Mk, Dg, (B, Pg)
#4814 IκBα (L35A5) Mouse mAb (Amino-terminal Antigen)	W, IP, IHC-P, IF-IC, F	H, M, R, Mk, B, Pg
#2697 Phospho-IKKα/β (Ser176/180) (16A6) Rabbit mAb	W, IHC-P, IHC-F	H, M, R, Mk, (B)
#2685 IKKγ Antibody	W, IHC-P	H, M, R, Mk
#3344 Jak1 (6G4) Rabbit mAb	W, IP, IHC-P	H, M, R, (Mk, Dg, Pg)
#3230 Jak2 (D2E12) XP™ Rabbit mAb	XP W, IP, IHC-P, IF-IC, F	H, M, R, (Mk)
#9166 LAT Antibody	W, IP, IHC-P, F	H, M, (R)
#2984 Lck (D88) XP™ Rabbit mAb	XP W, IHC-P	H
#2796 Lyn (C13F9) Rabbit mAb	W, IP, IHC-P	H
#3037 Phospho-NF-κB p65 (Ser276) Antibody	W, IHC-P	H, M, R, (B, Dg, Pg)
#4808 Phospho-NF-κB p105 (Ser933) (178F3) Rabbit mAb (IHC Specific)	IHC-P	H
#4764 NF-κB p65 (C22B4) Rabbit mAb	W, IHC-P, IF-IC, F	H, M, R, Mk, B, (Dg)
NEW #3987 NF-κB p65 (E498) Antibody	W, IP, IHC-P, IF-IC, F	H, M, R, Hm, Mk, Mi, B, Dg, Pg
#3017 NF-κB2 p100/p52 (18D10) Rabbit mAb (Human Specific)	W, IHC-P, F	H, Mk
#3187 NQO1 (A180) Mouse mAb	W, IHC-P, IF-IC	H
#4730 Pim-2 (D1D2) XP™ Rabbit mAb	XP W, IP, IHC-P, IF-IC	H
#2258 PU.1 (9G7) Rabbit mAb	W, IP, IHC-P, IF-IC, F, ChIP	H, M, (Mk, Pg)
#2266 PU.1 Antibody	W, IP, IHC-P, IF-IC, F, ChIP	H, M, (Mk, Pg)
NEW #4800 RAGE 1 Antibody	W, IHC-P	H, (Mk)
#4727 c-Rel Antibody	W, IP, IHC-P, IF-IC, F	H, Mk
#4958 SLP-76 Antibody	W, IP, IHC-P	H, M
#8113 SignalStain® Phospho-Stat IHC Sampler Kit	IHC-P	
#9167 Phospho-Stat1 (Tyr701) (58D6) Rabbit mAb	W, IP, IHC-P, IHC-F, IF-IC, F, ChIP	H, M
#9175 Stat1 (42H3) Rabbit mAb	W, IHC-P	H, Mk
#9145 Phospho-Stat3 (Tyr705) (D3A7) XP™ Rabbit mAb	XP W, IP, IHC-P, IHC-F, IF-IC, F, ChIP	H, M, R, Mk
#4113 Phospho-Stat3 (Tyr705) (M9C6) Mouse mAb	W, IP, IHC-P, IF-IC, F	H, M, R, Mk
#4904 Stat3 (79D7) Rabbit mAb	W, IP, IHC-P, ChIP	H, M, R, Mk
#9132 Stat3 Antibody	W, IP, IHC-P, ChIP	H, M, R, (B)
#9139 Stat3 (124H6) Mouse mAb	W, IP, IHC-P, IF-IC, F, ChIP	H, M, R, Mk
#9359 Phospho-Stat5 (Tyr694) (C11C5) Rabbit mAb	W, IP, IHC-P, F	H, M, (R, Mk, B)
#9314 Phospho-Stat5 (Tyr694) (C71E5) Rabbit mAb	W, IHC-P, IF-IC, F	H, M, (R, Mk, B)
#2429 Thioredoxin 1 (C63C6) Rabbit mAb	W, IHC-P	H, M, R
#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

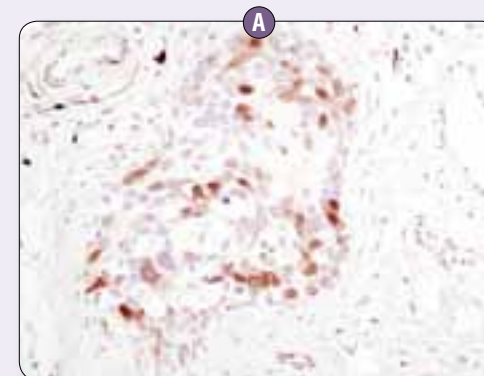
MAP Kinase Signaling

	Applications	Reactivity
#9225 Phospho-ATF-2 (Thr69/71) Antibody	W, IHC-P	H, M, R, Mk
#9221 Phospho-ATF-2 (Thr71) Antibody	W, IP, IHC-P, IHC-F, IF-IC, F	H, M, R, Mk
#9226 ATF-2 (20F1) Rabbit mAb	W, IP, IHC-P	H, M, R, Mk
#2251 FosB (5G4) Rabbit mAb	W, IP, IHC-P, IF-IC, F	H, M, R
#3753 JunB (C37F9) Rabbit mAb	W, IP, IHC-P, IF-IC	H, M, R, Mk
#2361 Phospho-c-Jun (Ser63) (54B3) Rabbit mAb	W, IHC-P	H, M, R
#9165 c-Jun (60A8) Rabbit mAb	W, IP, IHC-P, IHC-F, IF-IC	H, M, R, Mk
#3007 Phospho-MAPKAPK-2 (Thr334) (27B7) Rabbit mAb	W, IHC-P, IF-IC, F	H, M, R, Mk
#3041 Phospho-MAPKAPK-2 (Thr334) Antibody	W, IHC-P	H, M, R, Mk
#2338 Phospho-MEK1/2 (Ser221) (166F8) Rabbit mAb	W, IHC-P, F	H, M, R, Mk, (Dg)
#4694 MEK1/2 (L38C12) Mouse mAb	W, IHC-P, IF-IC, F	H, M, R, Mk
#9595 Phospho-MSK1 (Thr581) Antibody	W, IP, IHC-P	H, M
#4511 Phospho-p38 MAPK (Thr180/Tyr182) (D3F9) XP™ Rabbit mAb	XP W, IP, IHC-P, IF-IC, F	H, M, R, Mk, Sc, (Hm, C, Z, B, Pg)
#4631 Phospho-p38 MAPK (Thr180/Tyr182) (12F8) Rabbit mAb	W, IHC-P, IF-IC	H, M, R, Mk, Dm, (Hm, Mi, Z)
#9212 p38 MAPK Antibody	W, IHC-P, IF-IC, F	H, M, R, Mk, (C)
#9218 p38α MAPK Antibody	W, IP, IHC-P	H, M, R, Mk
#4370 Phospho-p44/42 MAPK (Erk1/2) (Thr202/ Tyr204) (D13.14.4E) XP™ Rabbit mAb	XP W, IP, IHC-P, IF-IC, F	H, M, R, Hm, Mk, Mi, Dm, Z, B, Dg, Pg, Sc
#4376 Phospho-p44/42 MAPK (Erk1/2) (Thr202/Tyr204) (20G11) Rabbit mAb	W, IP, IHC-P	H, M, R, Mk, Mi, Dm, Z, Pg
#4695 p44/42 MAPK (Erk1/2) (137F5) Rabbit mAb	W, IP, IHC-P, IF-IC, F	H, M, R, Hm, Mk, Mi, Dm, Z, B, Dg, Pg, Sc, (C)
#9102 p44/42 MAPK (Erk1/2) Antibody	W, IP, IHC-P, IF-IC, F	H, M, R, Hm, Mk, Mi, Z, B, Pg, Sc
#4696 p44/42 MAPK (Erk1/2) (L34F12) Mouse mAb	W, IHC-P, IF-IC, F	H, M, R, Mk, Mi, Z, Pg
#9344 Phospho-p90RSK (Thr359/Ser363) Antibody	W, IP, IHC-P	H, M, R, Mk
#4668 Phospho-SAPK/JNK (Thr183/Tyr185) (81E11) Rabbit mAb	W, IP, IHC-P	H, M, R, Dm, Sc
#9251 Phospho-SAPK/JNK (Thr183/Tyr185) Antibody	W, IP, IHC-P	H, M, R, Hm, Mk, Dm, B, Sc, (X)

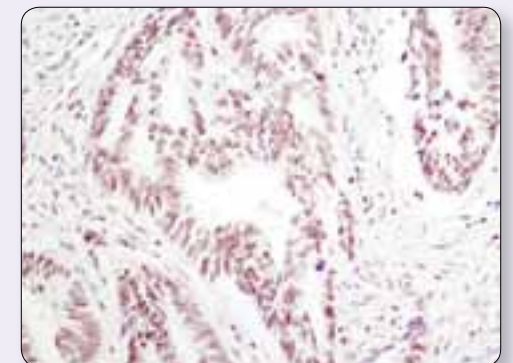
Application References:

Phospho-p44/42 MAPK (Erk1/2) (Thr202/Tyr204) (D13.14.4E) XP™ Rabbit mAb #4370: Hudon, V. et al. (2009) Renal tumor suppressor function of the Birt-Hogg-Dube syndrome gene product folliculin. *J. Med. Genet.* 47, 182–189. / Engelman, J.A. et al. (2008) Effective use of PI3K and MEK inhibitors to treat mutant Kras G12D and PIK3CA H1047R murine lung cancers. *Nat. Med.* 14, 1351–1356.

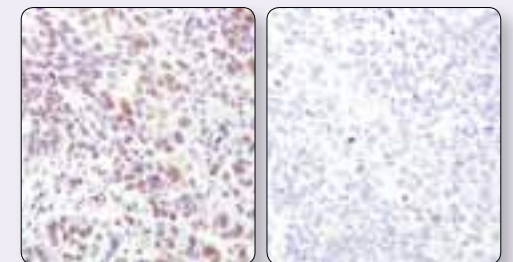
p38 MAPK Antibody #9212: Mudgett, J.S. et al. (2000) Essential role for p38alpha mitogen-activated protein kinase in placental angiogenesis. *Proc. Natl. Acad. Sci. USA* 97, 10454–10459.



Phospho-p44/42 MAPK (Erk1/2) (Thr202/Tyr204) (D13.14.4E) XP™ Rabbit mAb #4370: IHC analysis of paraffin-embedded human breast carcinoma (A) using #4370. IHC analysis on SignalSlide® Phospho-p44/42 MAPK (Thr202/Tyr204) IHC Controls #8103 [paraffin-embedded NIH/3T3 cells treated with U0126 #9903 (B) or TPA #4174 (C)], using #4370.

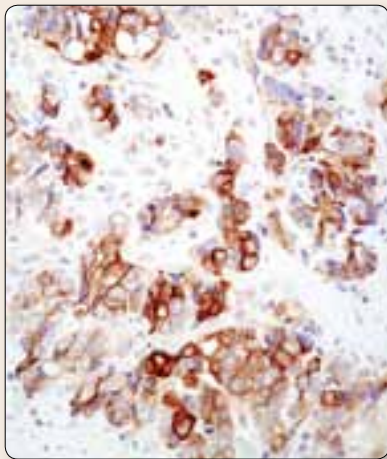


Phospho-p38 MAPK (Thr180/Tyr182) (D3F9) XP™ Rabbit mAb #4511: IHC analysis of paraffin-embedded human colon carcinoma using #4511.

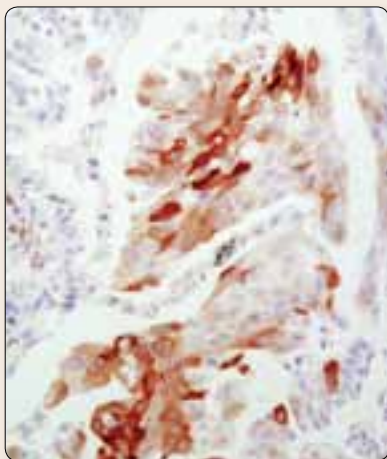


Phospho-SAPK/JNK (Thr183/Tyr185) (81E11) Rabbit mAb #4668: IHC analysis of paraffin-embedded human lung carcinoma in the presence of control peptide (left) or Phospho-SAPK/JNK (Thr183/Tyr185) Blocking Peptide #1215 (right) using #4668.

PI3 Kinase/Akt Signaling

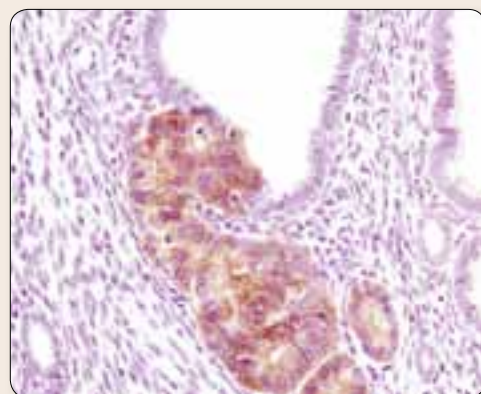
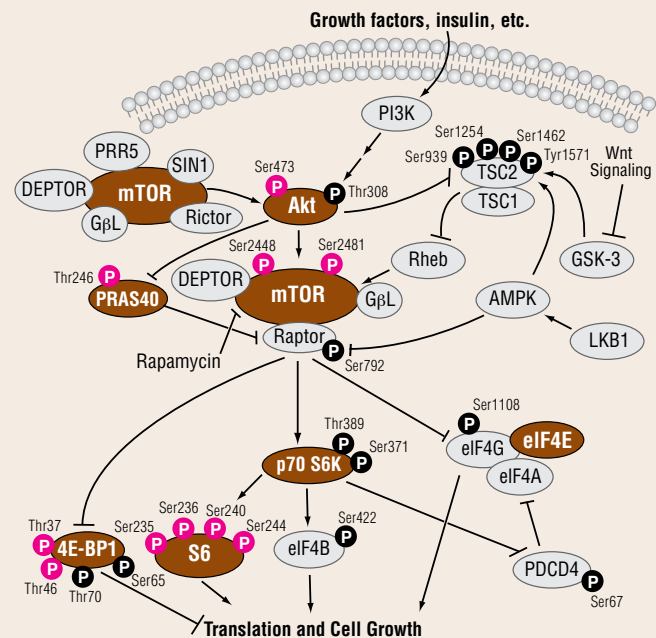


NDRG1 Antibody #5196: IHC analysis of paraffin-embedded human colon carcinoma using #5196.

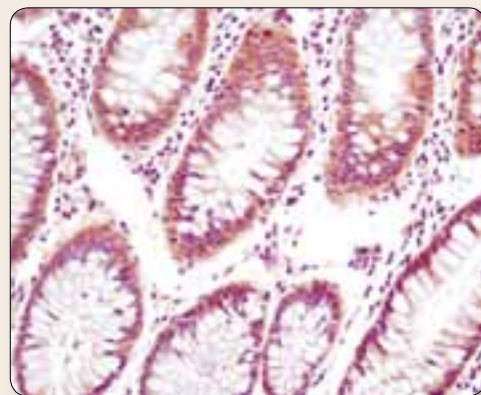


Phospho-NDRG1 (Thr346) (D98G11) XP™ Rabbit mAb #5482: IHC analysis of paraffin-embedded human lung carcinoma using #5482.

	Applications	Reactivity
#8107 SignalStain® Akt Pathway IHC Sampler Kit	IHC-P	
#4060 Phospho-Akt (Ser473) (D9E) XP™ Rabbit mAb	W, IP, IHC-P, IHC-F, IF-IC, F	H, M, R, Hm, Mk, Dm, Z, B, (C, X, Dg, Pg)
#3787 Phospho-Akt (Ser473) (736E11) Rabbit mAb	IHC-P, IHC-F	H, M, (R)
#4685 Akt (pan) (11E7) Rabbit mAb	W, IP, IHC-P, IF-IC, F	H, M, R, Mk
#4691 Akt (pan) (C67E7) Rabbit mAb	W, IP, IHC-P, IF-IC, F	H, M, R, Mk, Dm
#2920 Akt (pan) (40D4) Mouse mAb	W, IP, IHC-P, IF-IC, F	H, M, R, Mk
#2938 Akt1 (C73H10) Rabbit mAb	W, IP, IHC-P	H, M, R, Mk
#2880 FoxO1 (C29H4) Rabbit mAb	W, IHC-P, IF-IC	H, M, R, Mk
#9467 FoxO3a Antibody	W, IHC-P	H, Mk, (M, R)
#9316 Phospho-GSK-3α (Ser21) (36E9) Rabbit mAb	W, IHC-P	H, M, R, Mk
#9331 Phospho-GSK-3α/β (Ser21/9) Antibody	W, IHC-P	H, M, R, Mk, Z
#9323 Phospho-GSK-3β (Ser9) (5B3) Rabbit mAb	W, IHC-P, IF-IC	H, M, R, Mk
#9315 GSK-3β (27C10) Rabbit mAb	W, IP, IHC-P	H, M, R, Mk
NEW #5482 Phospho-NDRG1 (Thr346) (D98G11) XP™ Rabbit mAb	W, IHC-P, IF-IC, F	H, M, R, Mk
NEW #5196 NDRG1 Antibody	W, IP, IHC-P	H, B
#5880 eNOS (6H2) Mouse mAb	W, IHC-P	H, M, R, B
#4249 PI3 Kinase p110α (C73F8) Rabbit mAb	W, IP, IHC-P	H, M, R, B
#2997 Phospho-PRAS40 (Thr246) (C77D7) Rabbit mAb	W, IP, IHC-P	H, M, R, Mk
#2691 PRAS40 (D23C7) XP™ Rabbit mAb	W, IP, IHC-P	H, M, R, Mk
#9188 PTEN (D4.3) XP™ Rabbit mAb	W, IP, IHC-P	H, M, R, Mk
#9559 PTEN (138G6) Rabbit mAb	W, IP, IHC-P	H, M, R, Mk
#4042 TCL1 Antibody	W, IHC-P	H, (M)
#4911 Phospho-YAP (Ser127) Antibody	W, IHC-P	H, M, R, (Mk, B)
#4912 YAP Antibody	W, IP, IHC-P, F	H, M, R
#4202 YB1 (D299) Antibody	W, IHC-P, IF-IC	H, M, R, Mk, (X, B)



Phospho-Akt (Ser473) (D9E) XP™ Rabbit mAb #4060: IHC analysis of paraffin-embedded PTEN heterozygous mutant mouse endometrium using #4060. (Tissue section courtesy of Dr. Sabina Signoretti, Brigham and Women's Hospital, Harvard Medical School, Boston, MA.)



PTEN (D4.3) XP™ Rabbit mAb #9188: IHC analysis of paraffin-embedded human colon using #9188.

Application References:

Phospho-Akt (Ser473) (D9E) XP™ Rabbit mAb #4060: Guertin, D.A. et al. (2009) mTOR complex 2 is required for the development of prostate cancer induced by Pten loss in mice. *Cancer Cell* 15, 148–159. / Engelman, J.A. et al. (2008) Effective use of PI3K and MEK inhibitors to treat mutant Kras G12D and PIK3CA H1047R murine lung cancers. *Nat. Med.* 14, 1351–1356.

FoxO1 (C29H4) Rabbit mAb #2880: Guertin, D.A. et al. (2009) mTOR complex 2 is required for the development of prostate cancer induced by Pten loss in mice. *Cancer Cell* 15, 148–159.

Phospho-GSK-3β (Ser9) (5B3) Rabbit mAb #9323: Guertin, D.A. et al. (2009) mTOR complex 2 is required for the development of prostate cancer induced by Pten loss in mice. *Cancer Cell* 15, 148–159.

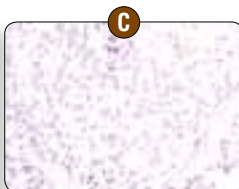
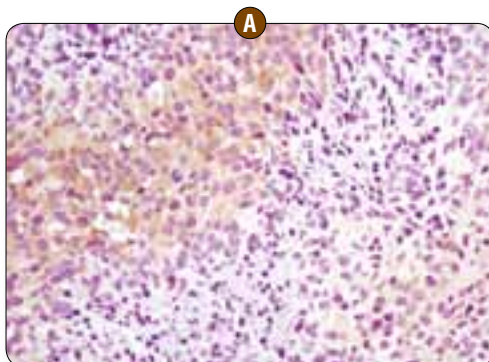
PTEN (138G6) Rabbit mAb #9559: Saal, L.H. (2008) Recurrent gross mutations of the PTEN tumor suppressor gene in breast cancers with deficient DSB repair. *Nat. Genet.* 40, 102–107.

PRAS40

Many growth factors and hormones induce the phosphoinositide 3-kinase signaling pathway, which results in the activation of downstream effector proteins such as the serine/threonine kinase Akt. Proline-rich protein (PRAS40), a 40 kDa Akt substrate, binds mTOR to transduce Akt signaling to the mTOR complex. Inhibition of mTOR signaling stimulates PRAS40 binding to mTOR, which in turn inhibits mTOR activity. PRAS40 interacts with Raptor in mTOR complex 1 (mTORC1) in insulin-deprived cells and inhibits the activation of the mTORC1 pathway mediated by the cell cycle protein Rheb. Phosphorylation of PRAS40 by Akt at Thr246 relieves PRAS40 inhibition of mTORC1.

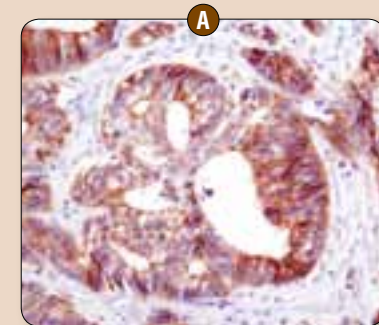
Phospho-PRAS40 (Thr246) (C77D7) Rabbit mAb #2997: IHC analysis of paraffin-embedded metastatic SKOV-3 tumor in mouse lung (A) and breast carcinoma, control (B) or λ phosphatase-treated (C), using #2997.

Application References: Phospho-PRAS40 (Thr246) (C77D7) Rabbit mAb #2997: Anderson, J.N. et al. (2010) Pathway-based identification of biomarkers for targeted therapeutics: personalized oncology with PI3K pathway inhibitors. *Sci. Transl. Med.* 2, 43–55.



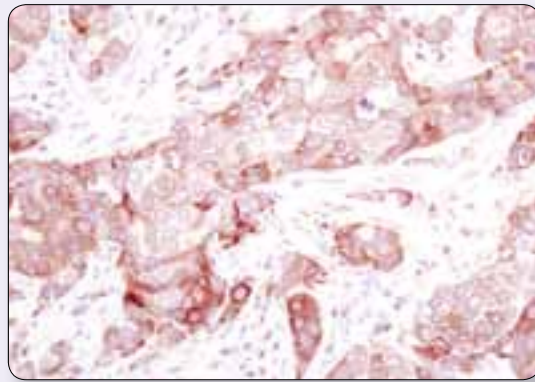
Pre-optimization from Lot to Lot

Every antibody validated for IHC undergoes thorough testing prior to any new lot release. This ensures the stability and reproducibility necessary for consistently accurate results.

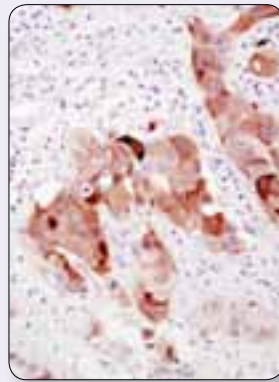


E-Cadherin (24E10) Rabbit mAb #3195: IHC analysis of adjacent sections of paraffin-embedded human colon carcinoma using #3195 lot 2 at a 1:25 dilution (A), #3195 lot 3 at a 1:25 dilution (B), #3195 lot 3 at a 1:50 dilution (C) and #3195 lot 3 at a 1:100 dilution (D). The recommended dilution for lot 3 was changed from 1:25 to 1:50.

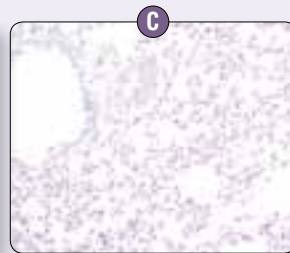
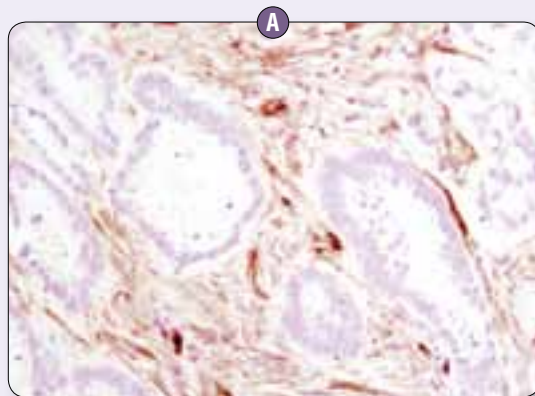
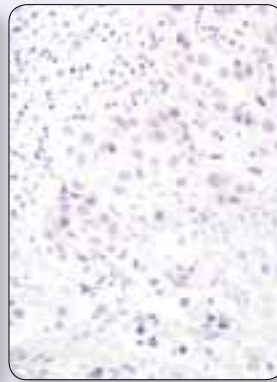
Cytoskeletal Regulation and Adhesion



Stathmin Antibody #3352: IHC analysis of paraffin-embedded human breast carcinoma using #3352.



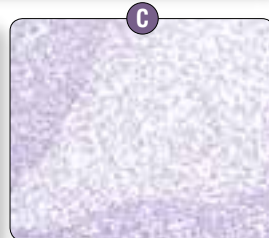
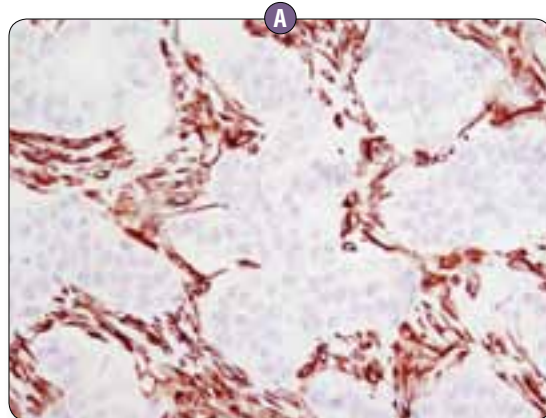
Phospho-Stathmin (Ser38) (D19H10) Rabbit mAb #4191: IHC analysis of paraffin-embedded human breast carcinoma, control (left) or λ phosphatase-treated (right), using #4191.



Caveolin-1 (D46G3) XP[™] Rabbit mAb #3267: IHC analysis of paraffin-embedded human colon carcinoma (A) and mouse lung, in the presence of control peptide (B) or antigen-specific peptide (C), using #3267.

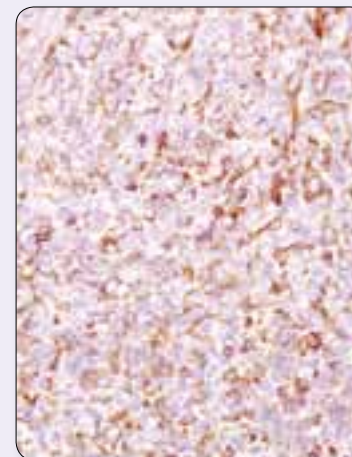
Vimentin

The cytoskeleton consists of three types of cytosolic fibers: microfilaments (actin filaments), intermediate filaments and microtubules. Major types of intermediate filaments are distinguished by their cell specific expression: cytokeratins (epithelial cells), glial fibrillary acidic protein (GFAP) (glial cells), desmin (skeletal, visceral and certain vascular smooth muscle cells), vimentin (cells of mesenchymal origin), and neurofilaments (neurons). GFAP and vimentin form intermediate filaments in astroglial cells and modulate their motility and shape. In particular, vimentin filaments are present at early developmental stages, while GFAP filaments are characteristic of differentiated and mature brain astrocytes. Vimentin is present in sarcomas, but not carcinomas, and its expression is examined in conjunction with that of other markers to distinguish between the two. The dynamic structural changes and spatial re-organization of vimentin in response to extracellular stimuli helps to coordinate various signaling pathways.



Vimentin (D21H3) XP[™] Rabbit mAb #5741: IHC analysis of paraffin-embedded human breast carcinoma (A) and human tonsil, in the presence of control peptide (B) or antigen-specific peptide (C), using #5741.

	Applications	Reactivity
#4968 Pan-Actin Antibody	W, IHC-P	H, M, R, Mk, Z, (Dm, X, B, Pg)
#4970 β -Actin (13E5) Rabbit mAb	W, IHC-P, IHC-F, IF-IC, F	H, M, R, Mk, B, Pg, (C, Dg)
#3700 β -Actin (8H10D10) Mouse mAb	W, IHC-P, IF-IC, F	H, M, R, Hm, Mk
#4068 Pan-Cadherin Antibody	W, IP, IHC-P	H, M, R, Mk, Dm, Z, B
#3195 E-Cadherin (24E10) Rabbit mAb	W, IHC-P, IHC-F, IF-IC, F	H, M, (Dg)
#4065 E-Cadherin Antibody	W, IP, IHC-P, IF-IC	H, M, (B, Dg)
#2309 γ -Catenin Antibody	W, IP, IHC-P, IF-IC	H, M, R, Hm, Mk
#3267 Caveolin-1 (D46G3) XP [™] Rabbit mAb	XP W, IP, IHC-P, IF-IC, F	H, M, R, Hm, Mk, B, Dg
#3238 Caveolin-1 Antibody	W, IP, IHC-P, IHC-F, IF-IC, F	H, M, R, Hm, Z, B, Pg
#4915 CD54 (ICAM-1) Antibody	W, IHC-P	H
#3576 CD56 (NCAM) (123C3) Mouse mAb	W, IHC-P, F	H
#2383 CEA/CD66e (CB30) Mouse mAb	W, IHC-P, IF-IC, F	H
#3512 Connexin 43 Antibody	W, IHC-P, IHC-F, IF-F, IF-IC	H, M, R, Mk, Z, (Dg, Pg)
#3502 Cortactin Antibody	W, IHC-P	H, M, R, Mk
#2929 EpCAM (VU1D9) Mouse mAb	W, IHC-P, IF-IC, F	H
#3149 Phospho-Ezrin (Thr567)/Radixin (Thr564)/Moesin (Thr558) (41A3) Rabbit mAb	W, IHC-P, IF-IC	H, M, R, Mk, Dm, B, (X, Dg)
#3142 Ezrin/Radixin/Moesin Antibody	W, IHC-P	H, M, R, Mk, B, (X)
#3145 Ezrin Antibody	W, IP, IHC-P, IF-IC, F	H, M, R, Mk, B
#3862 ILK1 Antibody	W, IHC-P	H, M, R, Mk, B
#4545 Pan-Keratin (C11) Mouse mAb	W, IHC-P, IF-IC, IF-P, F	H, R, Mk
#3984 Keratin 17/19 (D32D9) XP [™] Rabbit mAb	XP W, IHC-P	H, M, R, Mk
#4546 Keratin 8/18 (C51) Mouse mAb	W, IHC-P, F	H, Mk
#4548 Keratin 18 (DC10) Mouse mAb	W, IHC-P, IF-IC, F	H
#4558 Keratin 19 (BA17) Mouse mAb	W, IHC-P	H
#3389 LPP (8B3A11) Mouse mAb	W, IP, IHC-P, IF-IC	H, M, Hm, Mk
#4538 MUC1 (VU4H5) Mouse mAb	W, IP, IHC-P, F	H
#2602 PAK1 Antibody	W, IP, IHC-P	H, M, R, Mk
NEW #4191 Phospho-Stathmin (Ser38) (D19H10) Rabbit mAb	W, IP, IHC-P, IF-IC	H, Mk
#3352 Stathmin Antibody	W, IHC-P	H, M, R, Mk
#2125 α -Tubulin (11H10) Rabbit mAb	W, IHC-P, IF-IC, F	H, M, R, Mk, Dm, B, (Dg)
#2144 α -Tubulin Antibody	W, IHC-P, IF-IC, F	H, M, R, Mk, Dm, B, (X)
#3873 α -Tubulin (DM1A) Mouse mAb	W, IP, IHC-P, IF-IC	H, M, R, Mk
#2148 α/β -Tubulin Antibody	W, IHC-P, IF-IC, F	H, M, R, Mk, Z, B
#2128 β -Tubulin (9F3) Rabbit mAb	W, IHC-P, IF-IC, F	H, M, R, Mk, Z, B, (C)
#2146 β -Tubulin Antibody	W, IHC-P, IF-IC, F	H, M, R, Mk, Z, B, (X)
#3111 Phospho-VASP (Ser157) Antibody	W, IHC-P	H, M, R, Mk
#4866 VDAC Antibody	W, IHC-P	H, M, R, B
NEW #5741 Vimentin (D21H3) XP [™] Rabbit mAb	XP W, IHC-P, IF-IC, F	H, M, R, Mk

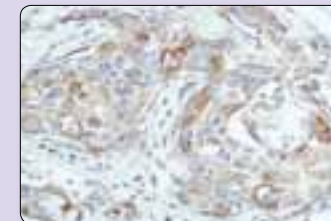


β -Actin (13E5) Rabbit mAb #4970: IHC analysis of paraffin-embedded 4T1 syngeneic mouse tumor using #4970.

Blocking Peptides

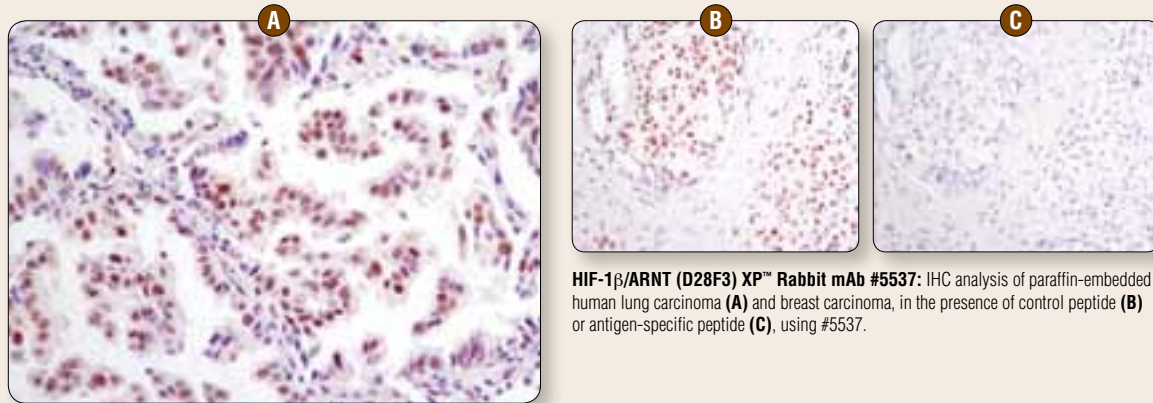
Blocking peptides are useful tools that demonstrate antibody specificity by preventing the interaction between antibody and antigen.

Please visit our website for a complete list of available blocking peptides, or contact us if you are interested in a custom order peptide.



β -Tubulin (9F3) Rabbit mAb #2128: IHC analysis of paraffin-embedded human breast carcinoma, using #2128 preincubated with control peptide (left) or β -Tubulin Blocking Peptide #1032 (right).

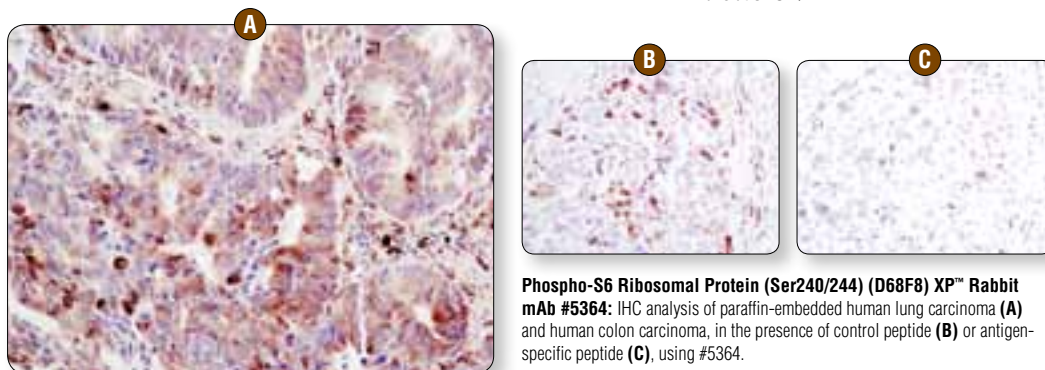
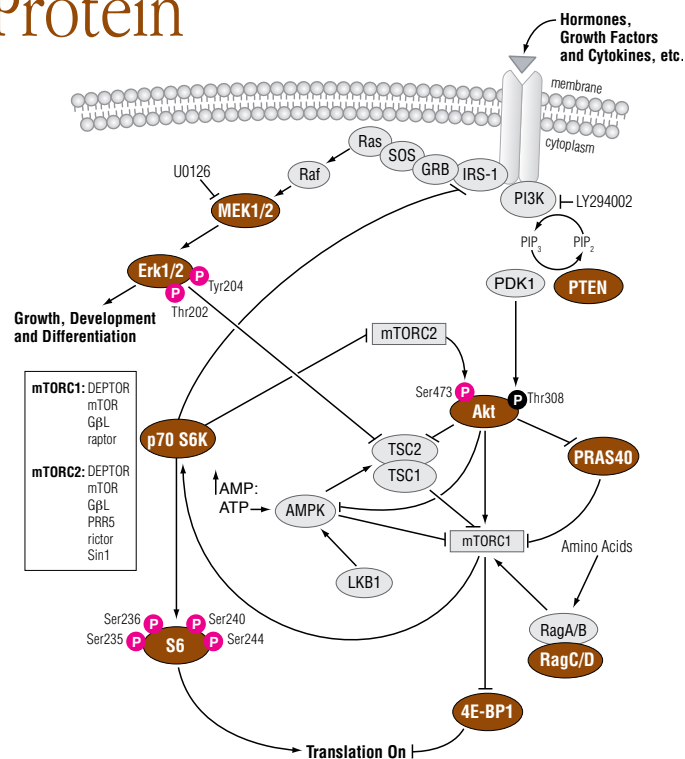
Translational Control



HIF-1 β /ARNT (D28F3) XP[™] Rabbit mAb #5537: IHC analysis of paraffin-embedded human lung carcinoma (A) and breast carcinoma, in the presence of control peptide (B) or antigen-specific peptide (C), using #5537.

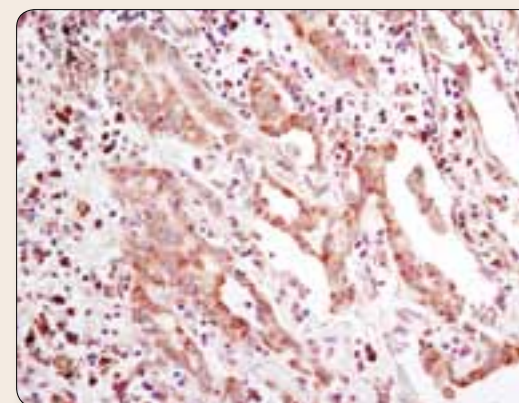
S6 Ribosomal Protein

One way that growth factors and mitogens effectively promote sustained cell growth and proliferation is by upregulating mRNA translation. Growth factors and mitogens induce the activation of p70 S6 kinase and the subsequent phosphorylation of the S6 ribosomal protein. Phosphorylation of S6 ribosomal protein correlates with an increase in translation of mRNA transcripts that contain an oligopyrimidine tract in their 5' untranslated regions. These particular mRNA transcripts (5'TOP) encode proteins involved in cell cycle progression as well as ribosomal proteins and elongation factors necessary for translation. Important S6 ribosomal protein phosphorylation sites include several residues (Ser235, Ser236, Ser240, and Ser244) located within a small, carboxy-terminal region of the S6 protein.



Phospho-S6 Ribosomal Protein (Ser240/244) (D68F8) XP[™] Rabbit mAb #5364: IHC analysis of paraffin-embedded human lung carcinoma (A) and human colon carcinoma, in the presence of control peptide (B) or antigen-specific peptide (C), using #5364.

	Applications	Reactivity
#2855 Phospho-4E-BP1 (Thr37/46) (236B4) Rabbit mAb	W, IHC-P, IF-IC, F	H, M, R, Mk, Dm
#9644 4E-BP1 (53H11) Rabbit mAb	W, IP, IHC-P, IF-IC, F	H, M, R, Mk
#2845 4E-BP2 Antibody	W, IP, IHC-P, F	H, M, R, Mk, B
NEW #5053 Argonaute 1 (D84G10) XP [™] Rabbit mAb	XP W, IP, IHC-P	H, M, R, Mk
#3177 BiP (C50B12) Rabbit mAb	W, IHC-P, IHC-F	H, M
#2679 Calnexin (C5C9) Rabbit mAb	W, IHC-P, IF-IC	H, Mk
#2433 Calnexin Antibody	W, IHC-P, IF-IC	H
#3398 Phospho-eIF2 α (Ser51) (D9G8) XP [™] Rabbit mAb	XP W, IP, IHC-P	H, M, R, Mk, Dm
#3597 Phospho-eIF2 α (Ser51) (119A11) Rabbit mAb	W, IP, IHC-P	H, M, R, Mk, Dm
NEW #5324 eIF2 α (D7D3) XP [™] Rabbit mAb	XP W, IP, IHC-P	H, M, R, Mk
#2103 eIF2 α (L57A5) Mouse mAb	W, IHC-P	H, M, R, Mk
#3411 eIF3A (D51F4) XP [™] Rabbit mAb	XP W, IP, IHC-P, IF-IC	H, M, R, Mk
#3413 eIF3H (D9C1) XP [™] Rabbit mAb	XP W, IP, IHC-P, IF-IC	H, M, R, Mk
#2067 eIF4E (C46H6) Rabbit mAb	W, IP, IHC-P	H, M, R, Mk
#9742 eIF4E Antibody	W, IHC-P, IHC-F	H, M, R, Mk, Z
#2469 eIF4G (C45A4) Rabbit mAb	W, IHC-P, IF-IC, F	H, M, R, Mk
#2498 eIF4G Antibody	W, IHC-P, IF-IC, F	H, M, R, Mk
#2858 eIF4GI Antibody	W, IHC-P, IF-IC	H, M, R
#3263 eIF6 Antibody	W, IP, IHC-P, IF-IC	H, M, R
#3798 ERp44 (D17A6) XP [™] Rabbit mAb	XP W, IHC-P	H, M, R, Mk
#3227 G β L Antibody	W, IP, IHC-P	H, Mk
#3593 Grp75 (D13H4) XP [™] Rabbit mAb	XP W, IP, IHC-P, IF-IC	H, M, Mk
NEW #5537 HIF-1 β /ARNT (D28F3) XP [™] Rabbit mAb	XP W, IP, IHC-P	H, M, R, Mk
#2066 MRPL11 (D68F2) XP [™] Rabbit mAb	XP W, IP, IHC-P, IF-IC	H, M, R, Mk
#2976 Phospho-mTOR (Ser2448) (49F9) Rabbit mAb (IHC Specific)	IHC-P, IHC-F	H, (M, R)
#2983 mTOR (7C10) Rabbit mAb	W, IHC-P, IF-IC, F	H, M, R, Mk
#3345 NME1/NDKA (D98) Antibody	W, IHC-P	H, M, R, Mk
#2708 p70 S6 Kinase (49D7) Rabbit mAb	W, IHC-P	H, M, R, Mk
#3505 Asymmetric-Methyl-PABP1 (Arg455/Arg460) (C60A10) Rabbit mAb	W, IP, IHC-P, IF-IC	H, M, R, Mk, (C)
#4992 PABP1 Antibody	W, IHC-P	H, M, R, Mk, (X, Z, B)
#3501 PDI (C81H6) Rabbit mAb	W, IP, IHC-P, IF-IC	H, M, R, Mk
#2446 PDI Antibody	W, IHC-P, IF-IC	H, M, R, Mk
#2997 Phospho-PRAS40 (Thr246) (C77D7) Rabbit mAb	W, IP, IHC-P	H, M, R, Mk
#2691 PRAS40 (D23C7) XP [™] Rabbit mAb	XP W, IP, IHC-P	H, M, R, Mk
NEW #5466 RagC (D31G9) XP [™] Rabbit mAb	XP W, IP, IHC-P	H, M, R, Mk
#4935 Rheb Antibody	W, IHC-P, F	H, M, R, Dm, Sc, (B)
NEW #4858 Phospho-S6 Ribosomal Protein (Ser235/236) (D57.2.2E) XP [™] Rabbit mAb	XP W, IHC-P, IHC-F, IF-IC, F	H, M, R, Mk, Sc
#4857 Phospho-S6 Ribosomal Protein (Ser235/236) (91B2) Rabbit mAb	W, IHC-P, IHC-F, IF-IC	H, M, R
#2211 Phospho-S6 Ribosomal Protein (Ser235/236) Antibody	W, IP, IHC-P, IHC-F, IF-IC, F	H, M, R, Mk, Sc, (C, X)
NEW #5364 Phospho-S6 Ribosomal Protein (Ser240/244) (D68F8) XP [™] Rabbit mAb	XP W, IP, IHC-P, IF-IC, F	H, M, R, Mk
#2217 S6 Ribosomal Protein (5G10) Rabbit mAb	W, IHC-P, IF-IC	H, M, R, Mk
NEW #2317 S6 Ribosomal Protein (54D2) Mouse mAb	W, IP, IHC-P, IF-IC, F	H, M, R, Mk, Dm
#4562 TFII-I Antibody	W, IP, IHC-P	H, M, Mk



eIF2 α (D7D3) XP[™] Rabbit mAb #5324: IHC analysis of paraffin-embedded human lung carcinoma using #5324.

Application References:

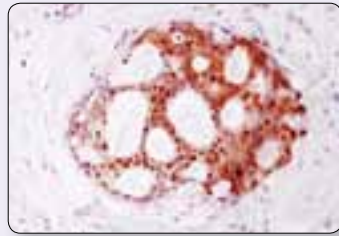
Phospho-S6 Ribosomal Protein (Ser235/236) (D57.2.2E) XP[™] Rabbit mAb #4858: Guertin, D.A. et al. (2009) mTOR complex 2 is required for the development of prostate cancer induced by Pten loss in mice. *Cancer Cell* 15, 148–159. / Hudon, V. et al. (2009) Renal tumor suppressor function of the Birt-Hogg-Dube syndrome gene product folliculin. *J. Med. Genet.* 47, 182–189. / Engelman, J.A. et al. (2008) Effective use of PI3K and MEK inhibitors to treat mutant Kras G12D and PIK3CA H1047R murine lung cancers. *Nat. Med.* 14, 1351–1356.

Phospho-4E-BP1 (Thr37/46) (236B4) Rabbit mAb #2855: Guertin, D.A. et al. (2009) mTOR complex 2 is required for the development of prostate cancer induced by Pten loss in mice. *Cancer Cell* 15, 148–159.

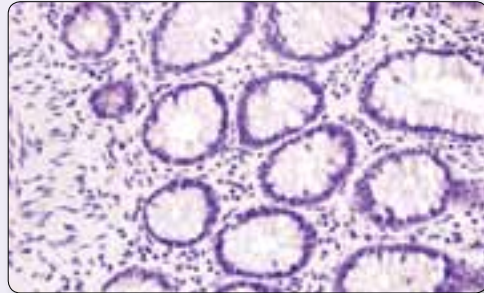
4E-BP1 (53H11) Rabbit mAb #9644: Rong, L. et al. (2008) Control of eIF4E cellular localization by eIF4E-binding proteins, 4E-BPs. *RNA* 14, 1318–1327.

Phospho-S6 Ribosomal Protein (Ser235/236) Antibody #2211: Choe, G. et al. (2003) Analysis of the phosphatidylinositol 3'-kinase signaling pathway in glioblastoma patients *in vivo*. *Cancer Res.* 63, 2742–2746. / Kenerson, H.L. (2002) Activated mammalian target of rapamycin pathway in the pathogenesis of tuberous sclerosis complex renal tumors. *Cancer Res.* 62, 5645–5650.

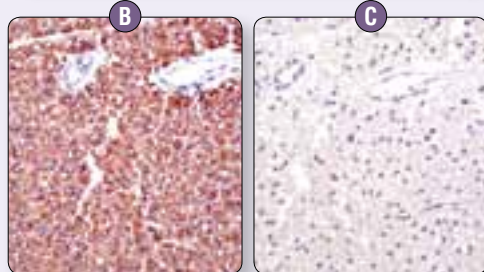
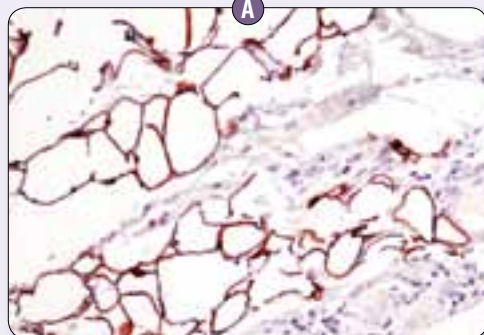
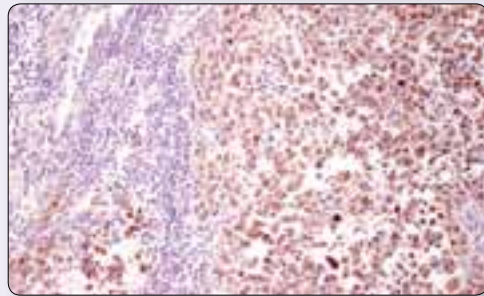
Glucose and Energy Metabolism



GAPDH (D16H11) XP™ Rabbit mAb #5174: IHC analysis of paraffin-embedded human breast carcinoma using #5174.



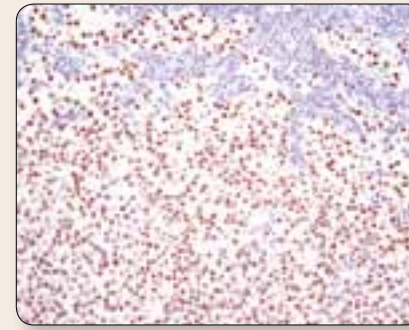
Tyrosinase (T311) Mouse mAb (IHC Specific) #9319: IHC analysis of paraffin-embedded human colon (top) and melanoma tissues (bottom) using #9319. Note lack of staining in human colon tissue (negative control).



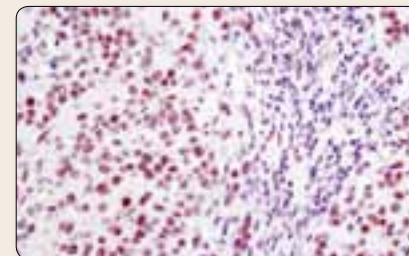
Perilipin (D1D8) XP™ Rabbit mAb #9349: IHC analysis of paraffin-embedded breast carcinoma (A) and mouse brown fat, in the presence of control peptide (B) or antigen-specific peptide (C), using #9349. Note specific staining of adipocytes.

	Applications	Reactivity
#3661 Phospho-Acetyl-CoA Carboxylase (Ser79) Antibody	W, IP, IHC-P	H, M, R, Mk, (C, B)
#3676 Acetyl-CoA Carboxylase (C83B10) Rabbit mAb	W, IHC-P, IF-IC, F	H, M, R, Hm
#3662 Acetyl-CoA Carboxylase Antibody	W, IP, IHC-P, IF-IC, F	H, M, R, Mk, B, (C, Dm)
#4047 ACSL1 Antibody	W, IHC-P	H, M, R
#2535 Phospho-AMPKα (Thr172) (40H9) Rabbit mAb	W, IP, IHC-P	H, M, R, Hm, Mk, Dm, Sc, (C, B)
#4186 Phospho-AMPKβ1 (Ser182) Antibody	W, IP, IHC-P	H, M, R, Mk
#4150 AMPKβ1/2 (57C12) Rabbit mAb	W, IHC-P, IF-IC, F	H, M, R, Hm, Mk
#3796 α-Amylase (D55H10) XP™ Rabbit mAb	XP W, IP, IHC-P	H, R, (M)
#2439 ATGL (30A4) Rabbit mAb	W, IP, IHC-P, IF-IC	M
#2138 ATGL Antibody	W, IP, IHC-P, IF-IC	M, (R)
#4593 C-Peptide Antibody	IHC-P, IHC-F, IF-F, IF-IC	H, M, R
#2033 DHCR24/Seladin-1 (C59D8) Rabbit mAb	W, IP, IHC-P	H, M
#3829 FAAH1 (C84F1) Rabbit mAb	W, IP, IHC-P	M, R
#3180 Fatty Acid Synthase (C20G5) Rabbit mAb	W, IP, IHC-P, IHC-F, IF-IC	H, M, R, (B)
NEW #5174 GAPDH (D16H11) XP™ Rabbit mAb	XP W, IHC-P, IF-IC	H, M, R, Mk
#2118 GAPDH (14C10) Rabbit mAb	W, IHC-P, IF-IC, F	H, M, R, Mk
#2760 Glucagon Antibody	IHC-P, IHC-F, IF-F	H, M, R
#3891 Phospho-Glycogen Synthase (Ser641) Antibody	W, IP, IHC-P	H, M, R
#3886 Glycogen Synthase (15B1) Rabbit mAb	W, IP, IHC-P	H, M, R
#2024 Hexokinase I (C35C4) Rabbit mAb	W, IP, IHC-P, IF-IC	H, M
#2867 Hexokinase II (C64G5) Rabbit mAb	W, IHC-P, IF-IC	H, M, R, Mk
#3113 HNF4α (C11F12) Rabbit mAb	W, IHC-P, IF-IC	H
#3922 IGFBP-2 Antibody	W, IP, IHC-P	H
#3027 IGF-I Receptor β Antibody	W, IP, IHC-P, IF-IC, F	H, M, R, Mk
#3014 Insulin (C27C9) Rabbit mAb	IHC-P, IF-F, IF-IC, F	H, M, R
#4590 Insulin Antibody	IHC-P, IF-F, IF-IC, F	H, M, R
#3558 LDHA/LDHC (C28H7) Rabbit mAb	W, IHC-P	H, M, R, Mk
#3582 LDHA (C4B5) Rabbit mAb	W, IHC-P, IF-IC	H, Mk
NEW #9349 Perilipin (D1D8) XP™ Rabbit mAb	XP W, IP, IHC-P, IF-F, IF-IC	H, M
#3470 Perilipin (D418) Antibody	W, IHC-P, IF-IC	M, (H)
#4053 PKM2 (D78A4) XP™ Rabbit mAb	XP W, IP, IHC-P, IF-IC	H, M, R, Mk
#3198 PKM2 Antibody	W, IHC-P, IHC-F	H, M, R, Mk
#3205 Pyruvate Dehydrogenase (C54G1) Rabbit mAb	W, IHC-P	H, M, R, Mk
#2794 SCD1 (C12H5) Rabbit mAb	W, IP, IHC-P, IF-IC	M
NEW #9319 Tyrosinase (T311) Mouse mAb (IHC Specific)	IHC-P	H

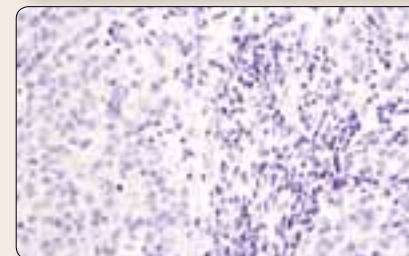
Stem Cell Markers, Development, and Differentiation



Nanog (D73G4) XP™ Rabbit mAb #4903: IHC analysis of paraffin-embedded human seminoma using #4903.



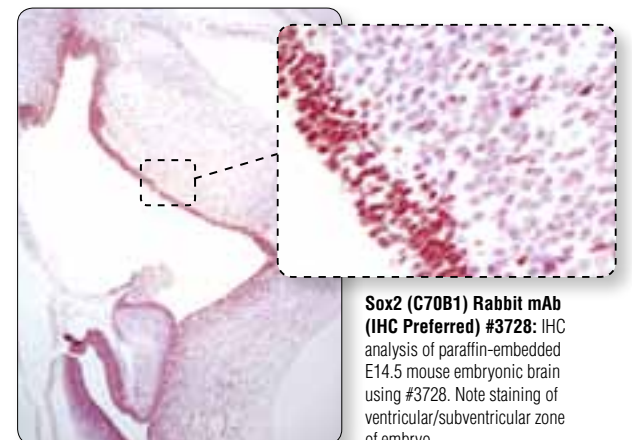
FoxP1 (D35D10) XP™ Rabbit mAb #4402: IHC analysis of paraffin-embedded human breast carcinoma in the presence of control peptide (top) or antigen-specific peptide (bottom) using #4402.



	Applications	Reactivity
#3208 AP-2α Antibody	W, IP, IHC-P	H, M, R, Mk
#2074 Axin1 (C95H11) Rabbit mAb	W, IP, IHC-P	H, Mk
#2087 Axin1 (C76H11) Rabbit mAb	W, IP, IHC-P	H, M
#9582 β-Catenin (6B3) Rabbit mAb	W, IP, IHC-P, IHC-F	H, M, R, Mk, (X, B, Dg, Pg)
#9562 β-Catenin Antibody	W, IP, IHC-P, ChIP	H, M, R, Mk, Z
#9587 β-Catenin Antibody (Carboxy-terminal Antigen)	W, IP, IHC-P, IHC-F, IF-F, F, ChIP	H, M, R, Mk, (C, X, B, Dg, Pg)
#3354 CACYBP Antibody	W, IHC-P, F	H, M, R, Mk
#3663 CD133 (C24B9) Rabbit mAb	W, IP, IHC-P, F	H
#3977 Cdx2 Antibody	W, IP, IHC-P, IF-IC, F	H, M, R
NEW #4402 FoxP1 (D35D10) XP™ Rabbit mAb	XP W, IP, IHC-P, F	H, M, R, Mk
#2005 FoxP1 Antibody	W, IP, IHC-P, IF-IC, F	H, M, (R)
#2230 LEF1 (C12A5) Rabbit mAb	W, IP, IHC-P, IF-IC, F	H, M, R
#3978 LIN28A (A177) Antibody	W, IP, IHC-P, IF-IC, F	H, M, (Mk)
#3249 Mic-1 (Y60) Antibody	W, IHC-P	H, (Mk)
#2071 Mili Antibody	W, IP, IHC-P, IF-F	M
#2079 Miwi (G82) Antibody	W, IP, IHC-P, IF-F	M
NEW #4903 Nanog (D73G4) XP™ Rabbit mAb	XP W, IHC-P, IF-IC, F	H, (Mk)
#4893 Nanog (1E6C4) Mouse mAb	W, IHC-P, IF-IC, F	H
#3608 Notch1 (D1E11) XP™ Rabbit mAb	XP W, IHC-P	H, (M, R)
#9585 Slug (C19G7) Rabbit mAb	W, IP, IHC-P, IF-IC	H, M
#4744 SSEA1 (MC480) Mouse mAb	IHC-P, IF-IC, F	M
#2890 Oct-4A (C52G3) Rabbit mAb	W, IHC-P, IF-IC, F, ChIP	H
#2750 Oct-4 Antibody	W, IHC-P, IF-IC, F, ChIP	H
#3579 Sox2 (D6D9) XP™ Rabbit mAb	XP W, IHC-P, IF-IC, F	H, (Mk, B, Dg)
#3728 Sox2 (C70B1) Rabbit mAb (IHC Preferred)	W, IHC-P	M
#2203 TCF1 (C63D9) Rabbit mAb	W, IP, IHC-P, IF-IC, F	H, M
#4746 TRA-1-60(S) (TRA-1-60(S)) Mouse mAb	W, IHC-P, IF-IC, F	H
#4745 TRA-1-81 (TRA-1-81) Mouse mAb	IHC-P, IF-IC, F	H

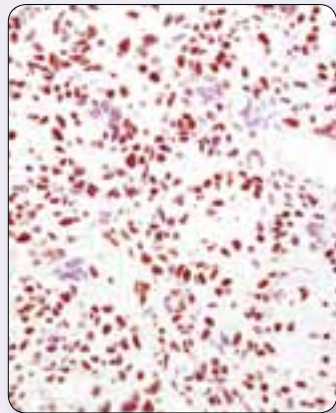
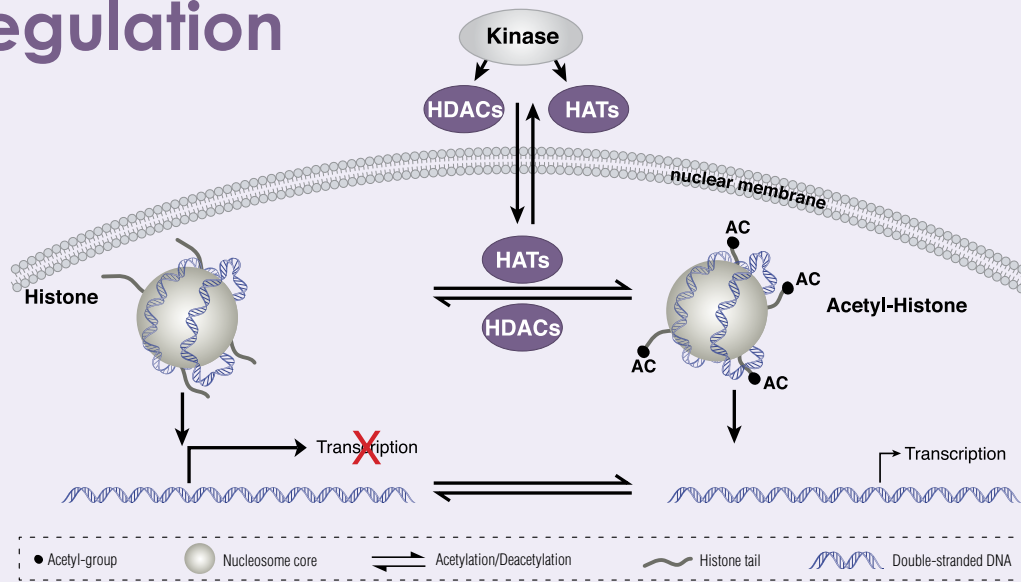
Sox2

Embryonic stem cells are derived from the inner cell mass of the blastocyst and are unique in their pluripotent capacity and potential for self-renewal. Sox2 is one of a set of transcription factors that are crucial for the maintenance of pluripotency. Sox2, Oct-4, and Nanog cooperate in this network, and siRNA knockdown of either Sox2 or Oct-4 results in loss of pluripotency. Chromatin immunoprecipitation experiments have shown that Sox2 and Oct-4 bind to thousands of gene regulatory sites, highlighting the importance of these transcription factors in early embryonic development. It has recently been shown that Sox2 is amplified in lung and esophageal squamous cell tumors.

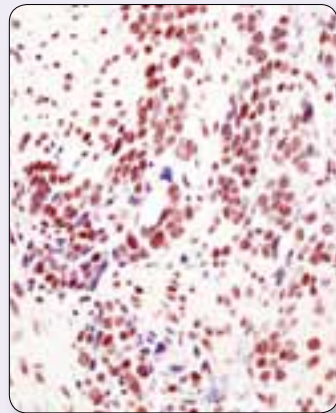


Sox2 (C70B1) Rabbit mAb (IHC Preferred) #3728: IHC analysis of paraffin-embedded E14.5 mouse embryonic brain using #3728. Note staining of ventricular/subventricular zone of embryo.

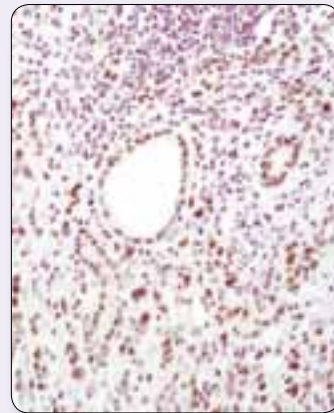
Chromatin and Epigenetic Regulation



Acetyl-Histone H3 (Lys9) (C5B11) Rabbit mAb #9649: IHC analysis of paraffin-embedded human osteosarcoma using #9649.



Acetyl-Histone H4 (Lys5) Antibody #9672: IHC analysis of paraffin-embedded human colon carcinoma using #9672.



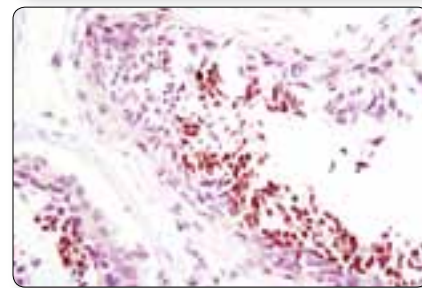
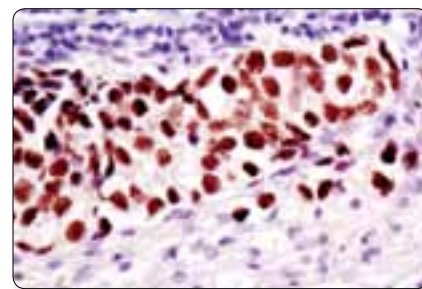
LSD1 (C69G12) Rabbit mAb #2184: IHC analysis of paraffin-embedded human stomach carcinoma using #2184.

NUT

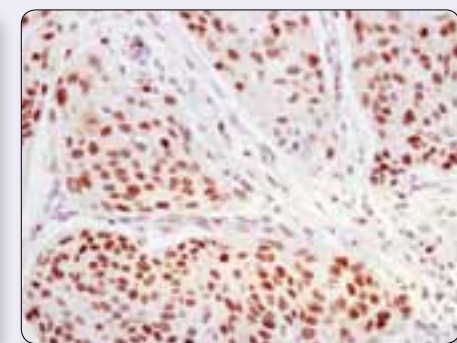
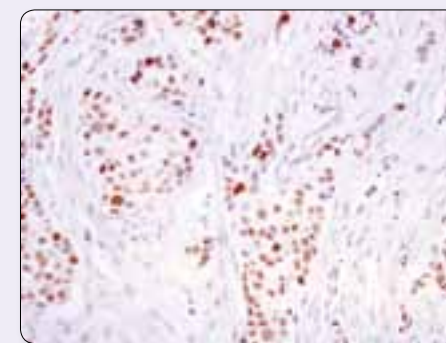
Nuclear protein in testis (NUT) is normally confined to the germ cells of the testis and ovary. NUT midline carcinoma (NMC) is a recently recognized cancer that is defined by the presence of chromosomal rearrangements involving the NUT gene on chromosome 15q14. In most cases the chromosomal translocation occurs between NUT and BRD4 on chromosome 19, resulting in the formation of a BRD4-NUT fusion protein. In the remaining tumors, variant NUT rearrangements are present involving BRD3, a very close homolog of BRD4. BRD4-NUT and BRD3-NUT encode fusion proteins that appear to contribute to carcinogenesis by blocking epithelial cell differentiation. NMCs, which are aggressive and highly lethal carcinomas, are morphologically indistinguishable from other poorly differentiated carcinomas.

NUT (C52B1) Rabbit mAb #3625: IHC analysis of paraffin-embedded human midline carcinoma (top) and normal human testes (bottom) using #3625.

Application References: **NUT (C52B1) Rabbit mAb #3625:** Haack, H. et al. (2009) Diagnosis of NUT midline carcinoma using a NUT-specific monoclonal antibody. *Am. J. Surg. Pathol.* 33, 984-991.



	Applications	Reactivity
#2990 ASF1A (C6E10) Rabbit mAb	W, IP, IHC-P, IF-IC	H, M, Mk, (C, B)
#3418 CTCF (D31H2) XP™ Rabbit mAb	XP W, IP, IHC-P, IF-IC, ChIP	H, M, R, Mk, (B)
NEW #5246 Ezh2 (D2C9) XP™ Rabbit mAb	XP W, IP, IHC-P, IF-IC, ChIP	H, M, R, Mk
#2005 FoxP1 Antibody	W, IP, IHC-P, IF-IC, F	H, M, (R)
#3815 Phospho-HDAC3 (Ser424) Antibody	W, IP, IHC-P, IF-IC	H, M, R, (Mk, C, X)
#2082 Histone Deacetylase 5 (HDAC5) Antibody	W, IP, IHC-P	H, M, R, Mk
#2576 Acetyl-Histone H2A (Lys5) Antibody	W, IP, IHC-P	H, M, R, Mk
#2578 Histone H2A Antibody II	W, IP, IHC-P	H, M, R, Mk, (C, X)
#3636 Histone H2A (L88A6) Mouse mAb	W, IHC-P	H, M, R, Mk, (C, Dm, Z, Pg)
#9718 Phospho-Histone H2A.X (Ser139) (20E3) Rabbit mAb	W, IHC-P, IF-IC, F	H, M, R, Mk
#2577 Phospho-Histone H2A.X (Ser139) Antibody	W, IHC-P, IF-IC, F	H, M, R
#2574 Acetyl-Histone H2B (Lys5) Antibody	W, IP, IHC-P	H, M, R, Mk
#2571 Acetyl-Histone H2B (Lys20) Antibody	W, IP, IHC-P, IF-IC, IC	H, M, R
#9649 Acetyl-Histone H3 (Lys9) (C5B11) Rabbit mAb	W, IHC-P, IF-IC, F, ChIP	H, M, R, Mk, Z
#9671 Acetyl-Histone H3 (Lys9) Antibody	W, IP, IHC-P, ChIP	H, M, R, Mk, Dm, Sc
#9711 Acetyl- and Phospho-Histone H3 (Lys9/Ser10) Antibody	W, IHC-P, IF-P	H, M, R
#9675 Acetyl-Histone H3 (Lys18) Antibody	W, IHC-P, ChIP	H, M, R
#9674 Acetyl-Histone H3 (Lys23) Antibody	W, IHC-P	H, M, R
#9725 Di-Methyl-Histone H3 (Lys4) (C64G9) Rabbit mAb	W, IP, IHC-P, IF-IC, ChIP	H, M, R, Mk
#9726 Di-Methyl-Histone H3 (Lys4) Antibody	W, IP, IHC-P, IF-IC, ChIP	H, M, R, Mk, (X, Z)
#9751 Tri-Methyl-Histone H3 (Lys4) (C42D8) Rabbit mAb	W, IHC-P, IF-IC, ChIP	H, M, R, Mk, Dm, Sc, (X, Z)
#9727 Tri-Methyl-Histone H3 (Lys4) Antibody	W, IP, IHC-P, IF-IC, ChIP	H, M, R, Mk, (X, Z)
#9753 Di-Methyl-Histone H3 (Lys9) Antibody	W, IP, IHC-P, IF-IC, ChIP	H, M, R, Mk, Dm, Sc
#9733 Tri-Methyl-Histone H3 (Lys27) (C36B11) Rabbit mAb	W, IP, IHC-P, IF-IC, ChIP	H, M, R, Mk, (X, Z)
#9756 Tri-Methyl-Histone H3 (Lys27) Antibody	W, IP, IHC-P, IF-IC, ChIP	H, M, R, Mk, (X)
#2901 Di-Methyl-Histone H3 (Lys36) (C75H12) Rabbit mAb	W, IHC-P, IF-IC	H, M, R, Mk
#9763 Tri-Methyl-Histone H3 (Lys36) Antibody	W, IHC-P, IF-IC	H, M, R, Mk
#9714 Phospho-Histone H3 (Thr3) Antibody	W, IHC-P	H, M, R
#9701 Phospho-Histone H3 (Ser10) Antibody	W, IP, IHC-P, IHC-F, IF-IC, F	H, M, R, Mk, C, Dm, Z, Sc, (X)
#4499 Histone H3 (D1H2) XP™ Rabbit mAb	XP W, IHC-P, IF-IC	H, M, R, Mk, (Hm, C, Dm, X, Z, B)
#9715 Histone H3 Antibody	W, IHC-P	H, M, R, Mk, Z, B, Pg, (Dm)
#3680 Histone H3 (96C10) Mouse mAb (IHC Formulated)	IHC-P	H, (M, R, Mk, Dm, X)
NEW #9672 Acetyl-Histone H4 (Lys5) Antibody	W, IP, IHC-P, IF-IC, ChIP	H, M, R, Mk, (C, Dm, X, Z, B, Pg)
#2591 Acetyl-Histone H4 (Lys12) Antibody	W, IHC-P, IF-IC, F	H, M, R, Mk
#2592 Histone H4 Antibody	W, IP, IHC-P	H, M, R, Mk, Dm, Z, Sc
#2935 Histone H4 (L64C1) Mouse mAb	W, IHC-P	H, M, R, Mk, Z, (Dm, X, Z, B)
#2623 HP1α (C7F11) Rabbit mAb	W, IP, IHC-P, IF-IC	H, M, R, Mk
#2616 HP1α Antibody	W, IP, IHC-P, IF-IC, F	H, M, R, Mk, (B)
#3100 JMJD1B (C6D12) Rabbit mAb	W, IP, IHC-P	H, Mk
#2088 LEDGF (C57G11) Rabbit mAb	W, IHC-P, IF-IC, F	H, M, R, (Mk)
#2184 LSD1 (C69G12) Rabbit mAb	W, IP, IHC-P, IHC-F, IF-IC	H, M, R, Mk
#2139 LSD1 Antibody	W, IP, IHC-P, IF-IC, F	H, M, R, Mk
#3456 MeCP2 (D4F3) XP™ Rabbit mAb	XP W, IP, IHC-P, IF-IC	H, M, R, Mk
#3625 NUT (C52B1) Rabbit mAb	W, IP, IHC-P, IF-F	H, R, (Mk)
#2627 SirT3 (C73E3) Rabbit mAb	W, IP, IHC-P	H, R, Mk



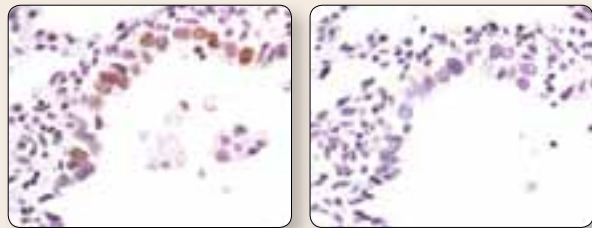
Ezh2 (D2C9) XP™ Rabbit mAb #5246: IHC analysis of paraffin-embedded human breast carcinoma (left) and human cervical carcinoma (right), using #5246.

Application References:

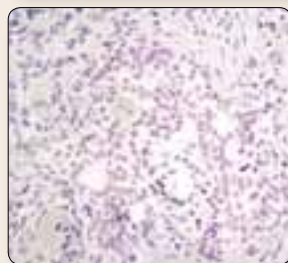
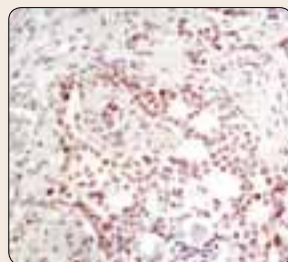
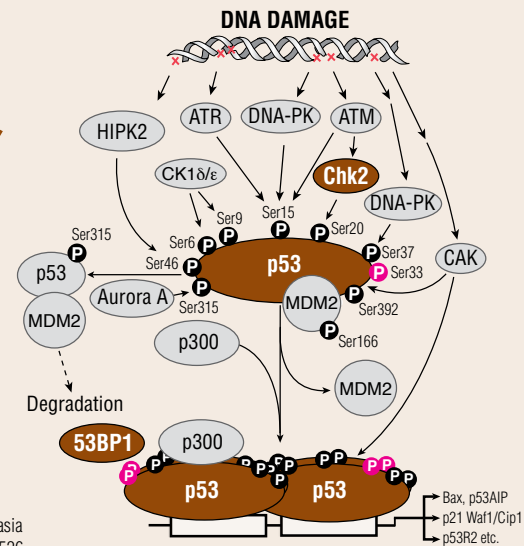
Acetyl-Histone H3 (Lys9) Antibody #9671: Kennedy, C. et al. (2002) Cell proliferation in the normal mouse mammary gland and inhibition by phenylbutyrate. *Mol. Cancer Ther.* 1, 1025-1033.

Phospho-Histone H3 (Ser10) Antibody #9701: Wang, Y. et al. (2001) The JIL-1 tandem kinase mediates histone H3 phosphorylation and is required for maintenance of chromatin structure in *Drosophila*. *Cell* 105, 433-443.

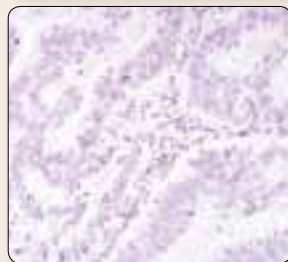
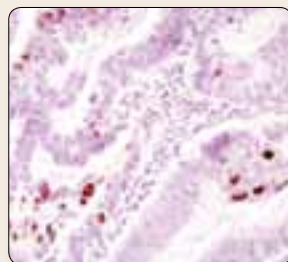
Cell Cycle, Checkpoint Control, and DNA Damage



Phospho-p53 (Ser33) Antibody #2526: IHC analysis of paraffin-embedded human lung dysplasia of alveolar cells in the presence of control peptide (left) or antigen specific peptide (right), using #2526.



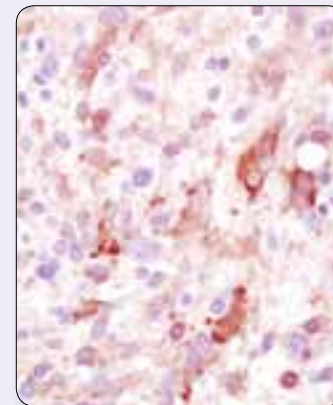
MSH2 (D24B5) XP™ Rabbit mAb #2017: IHC analysis of paraffin-embedded human breast carcinoma, in the presence of control peptide (top) or antigen-specific peptide (bottom), using #2017.



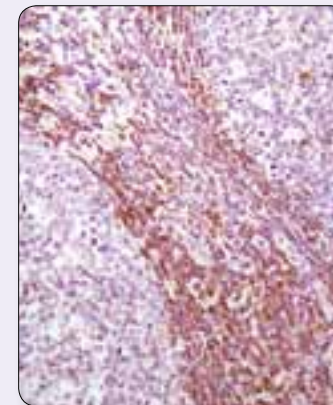
Phospho-Chk2 (Thr68) (C13C1) Rabbit mAb #2197: IHC analysis of paraffin-embedded human colon carcinoma, control (top) or λ-phosphatase-treated (bottom), using #2197.

	Applications	Reactivity
#5292 BrdU (Bu20a) Mouse mAb	IHC-P, IF-IC, F	All
#4937 53BP1 Antibody	W, IHC-P, IF-IC	H, Mk
#9116 cdc2 (POH1) Mouse mAb	W, IP, IHC-P, IF-IC	H, Mk
#4901 Phospho-cdc25C (Ser216) (63F9) Rabbit mAb	W, IP, IHC-P	H, Mk
#2916 CDK7 (MO1) Mouse mAb	W, IP, IHC-P	H, R
#2316 CDK9 (C12F7) Rabbit mAb	W, IP, IHC-P, IF-IC, F	H, M, R, Hm, Mk, B, Dg
#2666 Phospho-Chk2 (Ser19) Antibody	W, IHC-P	H
#2197 Phospho-Chk2 (Thr68) (C13C1) Rabbit mAb	W, IP, IHC-P, F	H, (Mk)
#3440 Chk2 (1C12) Mouse mAb	W, IHC-P, IF-IC	H, Mk
#2978 Cyclin D1 (92G2) Rabbit mAb	W, IHC-P, F	H, M, R
#2936 Cyclin D3 (DCS22) Mouse mAb	W, IHC-P	H, M, R
#4136 Phospho-Cyclin E (Thr62) Antibody	W, IP, IHC-P, F	H
#2927 Cyclin H Antibody	W, IP, IHC-P	H, M, R
#2180 Ku80 (C48E7) Rabbit mAb	W, IP, IHC-P, IHC-F, IF-IC	H, Mk
#2753 Ku80 Antibody	W, IP, IHC-P, IF-IC, F	H, Mk, (M, R)
#3619 MCM2 (D7G11) XP™ Rabbit mAb	XP W, IP, IHC-P, IF-IC, ChIP	H, M, R, Mk
#4007 MCM2 Antibody	W, IP, IHC-P, IF-IC	H, M, R, Hm, Mk
#4012 MCM3 Antibody	W, IP, IHC-P, IF-IC	H, M, R, Hm, Mk
#3735 MCM7 (D10A11) XP™ Rabbit mAb	XP W, IP, IHC-P, IF-IC	H, M, R, Hm, Mk, Dg
#4847 Mre11 (31H4) Rabbit mAb	W, IP, IHC-P, IHC-F, F	H
#4895 Mre11 Antibody	W, IP, IHC-P, IHC-F	H, M, R, Mk
#2017 MSH2 (D24B5) XP™ Rabbit mAb	XP W, IP, IHC-P, IF-IC, F	H, M, Mk
#4282 Myt1 Antibody	W, IHC-P	H, M, R, (X)
#3541 Phospho-NPM (Thr199) Antibody	W, IP, IHC-P, IF-IC	H, M, R
#3542 NPM Antibody	W, IHC-P	H, M, R
#2407 p14 ARF (4C6/4) Mouse mAb	W, IHC-P	H
#2947 p21 Waf1/Cip1 (12D1) Rabbit mAb	W, IP, IHC-P, IF-IC, F	H, Mk
#2946 p21 Waf1/Cip1 (DCS60) Mouse mAb	W, IP, IHC-P	H, Mk
#2526 Phospho-p53 (Ser33) Antibody	W, IHC-P	H, (Mk)
#2676 Phospho-p53 (Thr81) Antibody	W, IHC-P, IF-IC	H, Mk
#2527 p53 (7F5) Rabbit mAb	W, IHC-P, IF-IC, F	H, Mk
#4981 Phospho-p63 (Ser160/162) Antibody	W, IHC-P, F	H, (M, R, C, X)
#4942 PBK/TOPK Antibody	W, IHC-P	H, M, R
#2586 PCNA (PC10) Mouse mAb	W, IP, IHC-P, IF-IC	H, M, R, Mk, B, Pg
#2181 Phospho-Rb (Ser608) Antibody	W, IP, IHC-P	H, R, Mk, (Dg)
#9308 Phospho-Rb (Ser807/811) Antibody	W, IP, IHC-P	H, R, Mk
#9309 Rb (4H1) Mouse mAb	W, IP, IHC-P, IF-IC, F	H, Mk, B, Pg
#4735 Phospho-Rpb1 CTD (Ser2/5) Antibody	W, IHC-P	H, M, R, (Hm, Sc)
#4124 TIF1β (C42G12) Rabbit mAb	W, IHC-P, IF-IC, F	H, M, R, Mk
#4121 Phospho-TLK1 (Ser695) Antibody	W, IP, IHC-P	H, M, R

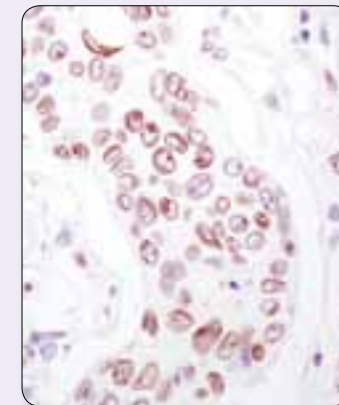
Apoptosis and Autophagy



LC3A (D50G8) XP™ Rabbit mAb #4599: IHC analysis of paraffin-embedded human glioblastoma multiforme using #4599.

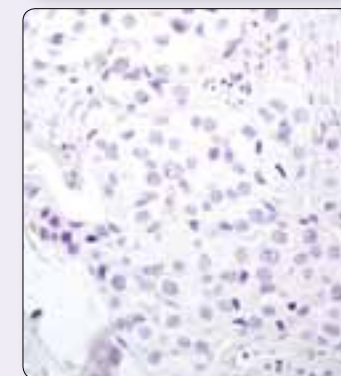
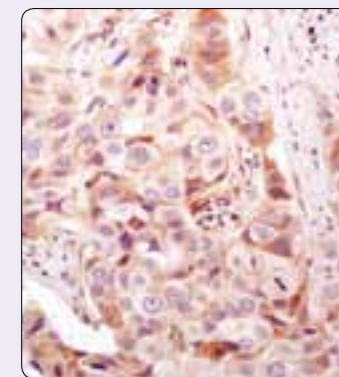


PDCD4 (D29C6) XP™ Rabbit mAb #9535: IHC analysis of paraffin-embedded human tonsil using #9535.



Lamin A/C (4C11) Mouse mAb #4777: IHC analysis of paraffin-embedded human colon carcinoma using #4777.

	Applications	Reactivity
#8109 SignalStain® Proliferation/Apoptosis IHC Sampler Kit	IHC-P	
#4642 AIF Antibody	W, IP, IHC-P, IF-IC	H, M, R
#5284 Phospho-Bad (Ser112) (40A9) Rabbit mAb	W, IHC-P, F	H, M, R, Mk
NEW #5023 Bax (D2E11) Rabbit mAb	W, IP, IHC-P	H
#2774 Bax Antibody (Human Specific)	W, IP, IHC-P	H, Mk
#2764 Bcl-xL (54H6) Rabbit mAb	W, IP, IHC-P, IHC-F, IF-IC, F	H, M, R, Mk
#2762 Bcl-xL Antibody	W, IP, IHC-P	H, M, R, Mk
#4592 Bik Antibody	W, IHC-P	H
#2933 Bim (C34C5) Rabbit mAb	W, IP, IHC-P, IF-IC, F	H, M, R, (Mk, B, Dg)
#2225 Caspase-1 Antibody	W, IP, IHC-P	H
#9664 Cleaved Caspase-3 (Asp175) (5A1E) Rabbit mAb	W, IP, IHC-P, IHC-F, IF-IC, F	H, M, R, Mk
#9661 Cleaved Caspase-3 (Asp175) Antibody	W, IHC-P, IHC-F, IF-IC, F	H, M, R, Mk, B, (Pg)
#9662 Caspase-3 Antibody	W, IP, IHC-P	H, M, R, Mk
#9496 Cleaved Caspase-8 (Asp391) (18C8) Rabbit mAb	W, IHC-P, IF-IC, F	H
#4850 COX IV (3E11) Rabbit mAb	W, IP, IHC-P, IHC-F, IF-IC, F	H, R, Mk, Z, B, Pg
#4844 COX IV Antibody	W, IP, IHC-P, IF-IC, F	H, M, R, Mk, B
#4280 Cytochrome c (136F3) Rabbit mAb	W, IHC-P	H, M, R, Mk
#4272 Cytochrome c Antibody	W, IHC-P	H, M, R, Mk, Dm, (B)
#2294 DRAK2 (33D7) Rabbit mAb	W, IP, IHC-P, F	M
#2035 Cleaved Lamin A (Small Subunit) Antibody	W, IHC-P, IF-IC	H, M, R
#2032 Lamin A/C Antibody	W, IHC-P	H, M, R, (B)
NEW #4777 Lamin A/C (4C11) Mouse mAb	W, IP, IHC-P, IF-F, IF-IC, F	H, M, R, Mk
#4599 LC3A (D50G8) XP™ Rabbit mAb	XP W, IP, IHC-P, IF-IC, F	H, M, R, (Mk, Dg)
#3868 LC3B (D11) XP™ Rabbit mAb	XP W, IP, IHC-P, IF-IC, F	H, M, R, (Mk, C, X, B, Pg)
NEW #5625 Cleaved-PARP (Asp214) (D64E10) XP™ Rabbit mAb	XP W, IP, IF-IC, F	H, Mk
#9541 Cleaved PARP (Asp214) Antibody (Human Specific)	W, IHC-P, IF-IC, F	H
#9535 PDCD4 (D29C6) XP™ Rabbit mAb	XP W, IP, IHC-P, IF-IC	H, M, R
#2954 Smac/Diablo Mouse mAb	W, IP, IHC-P, IF-IC	H, Mk
#2808 Survivin (71G4B7) Rabbit mAb	W, IP, IHC-P, IHC-F, IF-IC, F	H, M, R
#2429 Thioredoxin 1 (C63C6) Rabbit mAb	W, IHC-P	H, M, R
#3219 TRAIL (C92B9) Rabbit mAb	W, IP, IHC-P, IF-IC, F	H



Bax (D2E11) Rabbit mAb #5023: IHC analysis of paraffin-embedded human breast carcinoma in the presence of control peptide (top) or antigen-specific peptide (bottom) using #5023.

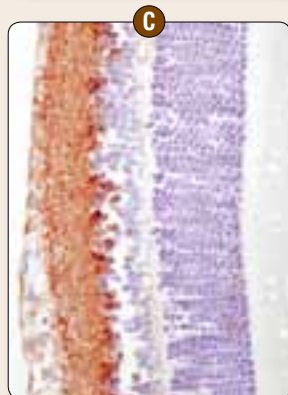
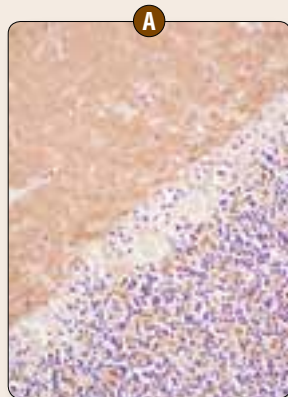
Application References:

Cleaved Caspase-3 (Asp175) Antibody #9661: Gown, A.M. and Willingham, M.C. (2002) Improved detection of apoptotic cells in archival paraffin sections: immunohistochemistry using antibodies to cleaved caspase 3. *J. Histochem. Cytochem.* 50, 449–454.

Cleaved Caspase-3 (Asp175) (5A1) Rabbit mAb #9664: Wada-Hiraike, O. et al. (2006) Role of estrogen receptor β in colonic epithelium. *Proc. Natl. Acad. Sci. USA* 103, 2959–2964.

Bcl-xL Antibody #2762: Saito, A. et al. (2003) Overexpression of copper/zinc superoxide dismutase in transgenic mice protects against neuronal cell death after transient focal ischemia by blocking activation of the Bad cell death signaling pathway. *J. Neurosci.* 23, 1710–1718.

Neuroscience



Synapsin-1 (D12G5) XP™ Rabbit mAb #5297: IHC analysis of paraffin-embedded human cerebellum (A), mouse cortex (B), and rat retina (C) using #5297.

Application References:
Phospho-CREB (Ser133) (87G3) Rabbit mAb #9198 and CREB (48H2) Rabbit mAb #9197: Kumar, A.P. et al. (2007) Akt/cAMP-responsive element binding protein/cyclin D1 network: a novel target for prostate cancer inhibition in transgenic adenocarcinoma of mouse prostate model mediated by Nexrutine, a Phellodendron amurense bark extract. *Clin. Cancer Res.* 13, 2784–2794. / Gosh, R. et al. (2007) Regulation of Cox-2 by cyclic AMP response element binding protein in prostate cancer: potential role for nexrutine. *Neoplasia.* 9, 893–899.

APP/β-Amyloid (NAB228) Mouse mAb #2450: Lee, E.B. et al. (2005) BACE overexpression alters the subcellular processing of APP and inhibits Aβ deposition *in vivo*. *J. Cell Biol.* 168, 291–302.

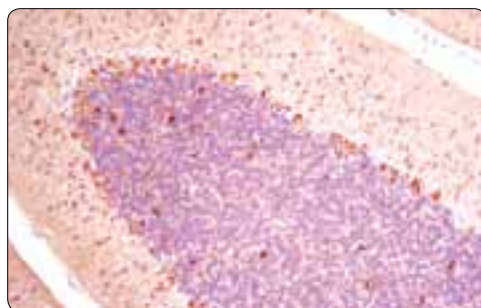
	Applications	Reactivity
#2454 β-Amyloid Antibody	W, IHC-P, IF-P	H
#2450 APP/β-Amyloid (NAB228) Mouse mAb	W, IHC-P, IF-P	H, (Mk, B, Dg, Pg)
#2173 Calbindin (C26D12) Rabbit mAb	W, IP, IHC-P	H, M, R
#9198 Phospho-CREB (Ser133) (87G3) Rabbit mAb	W, IHC-P, IHC-F, IF-F, IF-IC, F, CHIP	H, M, R
#9197 CREB (48H2) Rabbit mAb	W, IP, IHC-P, IHC-F, IF-F, IF-IC, F, CHIP	H, M, R, Mk, Dm
#2306 DARPP-32 (19A3) Rabbit mAb	W, IP, IHC-P, IF-F	M, R, (H)
#4153 EGR1 (15F7) Rabbit mAb	W, IP, IHC-P, IF-IC, CHIP	H, M, R, (B)
#3369 GSTP1 (3F2) Mouse mAb	W, IHC-P, IF-IC	H, Mk
#3670 GFAP (GA5) Mouse mAb	W, IP, IHC-P, IF-F	H, M, R
#4760 Nestin (Rat-401) Mouse mAb	IHC-P, IF-IC	R
#2836 Neurofilament-H (RMdO 20) Mouse mAb	W, IP, IHC-P, IF-F	H, M, R
#2837 Neurofilament-L (C28E10) Rabbit mAb	W, IHC-P, IF-F	H, M, R
#2835 Neurofilament-L (DA2) Mouse mAb	W, IHC-P, IF-F	H, M, R
#2838 Neurofilament-M (RMO 14.9) Mouse mAb	W, IP, IHC-P, IF-IC	H, M, R
#3366 Neuropilin-2 (D39A5) XP™ Rabbit mAb	XP W, IP, IHC-P, IF-F	M, R
#4231 nNOS (C7D7) Rabbit mAb	W, IP, IHC-P, IF-F	H, M, R
#4236 nNOS (C12H1) Rabbit mAb	W, IP, IHC-P, IF-F	H, M, R
#2680 p35/25 (C64B10) Rabbit mAb	W, IP, IHC-P, IF-F	H, M, R
#3813 Plexin A1 Antibody	W, IP, IHC-P	H, R, (M)
#3409 PSD95 (D74D3) XP™ Rabbit mAb	XP W, IHC-P	H, M, R
NEW #5297 Synapsin-1 (D12G5) XP™ Rabbit mAb	XP W, IP, IHC-P, IF-F	H, M, R
#4179 α-Synuclein (D37A6) XP™ Rabbit mAb	XP W, IP, IHC-P, IF-F	M, R
#2647 α-Synuclein (Syn204) Mouse mAb	W, IHC-P, IF-P	H
#2644 α/β-Synuclein (Syn205) Mouse mAb	W, IP, IHC-P, IF-F	H, M, R
#4019 Tau (Tau46) Mouse mAb	W, IHC-P, IF-F, IF-P	H, M, R, (B)
#2508 TrkA (14G6) Rabbit mAb	W, IHC-P	H
#4607 TrkB (80G2) Rabbit mAb	IHC-P, F	H, (M, R)
NEW #5666 β3-Tubulin (D65A4) XP™ Rabbit mAb	XP W, IP, IHC-P	H, M, R
#4466 β3-Tubulin (TU-20) Mouse mAb	W, IHC-P, IF-F	H, M, R

β3-Tubulin

The cytoskeleton consists of three types of cytosolic fibers: microtubules, microfilaments (actin filaments), and intermediate filaments. Globular tubulin subunits comprise the microtubule building block, with α/β-tubulin heterodimers forming the tubulin subunit common to all eukaryotic cells. β3-tubulin has been implicated as a critical regulator of axon guidance and maintenance. Mutations in β3-tubulin are associated with congenital fibrosis of extraocular muscles type 3A, a disorder characterized by ophthalmoplegia (inability to move eyes) and ptosis (eyelid drooping).

β3-Tubulin (D65A4) XP™ Rabbit mAb

#5666: IHC analysis of paraffin-embedded rat cerebellum using #5666.

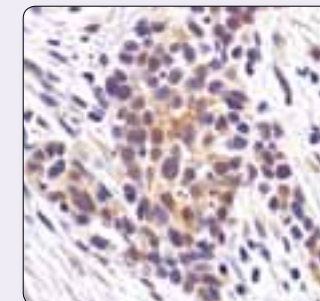


Protein Folding and Stability

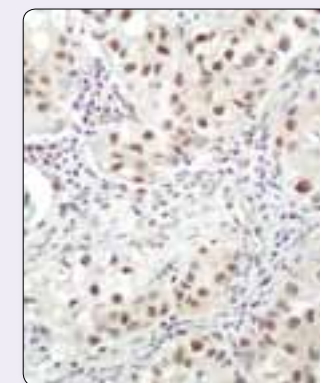
	Applications	Reactivity
#2284 Cathepsin D Antibody	W, IHC-P, F	H, Mk
#4356 HSF1 Antibody	W, IP, IHC-P, IF-IC, F, CHIP	H, M, R, Mk
#2405 Phospho-HSP27 (Ser78) Antibody	W, IHC-P, F	H, Mk
#2401 Phospho-HSP27 (Ser82) Antibody	W, IHC-P, IHC-F, IF-IC	H, M, R, Mk
#2406 Phospho-HSP27 (Ser82) Antibody II	W, IHC-P, IHC-F, IF-IC, F	H, M, R, Mk
#2402 HSP27 (G31) Mouse mAb	W, IHC-P, IF-IC	H, Mk
#4871 HSP40 (C64B4) Rabbit mAb	W, IHC-P	H, M, R, Mk
#4876 HSP70 (D69) Antibody	W, IHC-P, IHC-F, IF-IC, F	H, M, R, Mk
#4872 HSP70 Antibody	W, IHC-P	H, M, R, Mk, (B)
#4873 HSP70 (6B3) Rat mAb	W, IP, IHC-P, IF-IC, F	H, Mk
#4877 HSP90 (C45G5) Rabbit mAb	W, IHC-P, IF-IC, F	H, M, R, Mk
#4875 HSP90 (E289) Antibody	W, IHC-P, F	H, M, R, Mk
#4874 HSP90 Antibody	W, IHC-P	H, M, R, Mk, Dm, (C, Z, B)
#3801 MMP-7 (D4H5) XP™ Rabbit mAb	XP W, IHC-P	M, R
#3852 MMP-9 Antibody	W, IHC-P	H, (R)
#2754 NEDD8 (19E3) Rabbit mAb	W, IP, IHC-P, IF-IC, F	H, M, R, Mk, (X, Z, B)
#2745 NEDD8 Antibody	W, IP, IHC-P, IF-IC, F	H, M, R, Mk, (X, Z, B)
#2412 PA28γ Antibody	W, IP, IHC-P, IF-IC	H, M, R, Mk
#4940 SUMO-1 (C9H1) Rabbit mAb	W, IP, IHC-P	H, M, R
#4930 SUMO-1 Antibody	W, IP, IHC-P, IF-IC	H, M, R, Mk
#4996 UBC3B Antibody	W, IHC-P, F	H, M, R
#4890 UBE1a Antibody	W, IP, IHC-P, IF-IC, F	H, M, R
#3933 Ubiquitin Antibody	W, IHC-P	H, M, R, (Mk, Dm, X, Z, B, Pg)
#3936 Ubiquitin (P4D1) Mouse mAb	W, IHC-P, IF-IC	All

Application References:

Ubiquitin (P4D1) Mouse mAb #3936: Dinsdale, D. et al. (2004) Intermediate filaments control the intracellular distribution of caspases during apoptosis. *Am. J. Pathol.* 164, 395–407.



Phospho-HSP27 (Ser82) Antibody #2401: IHC analysis of paraffin-embedded human lung carcinoma using #2401.



Ubiquitin Antibody #3933: IHC analysis of paraffin-embedded human lung carcinoma using #3933.

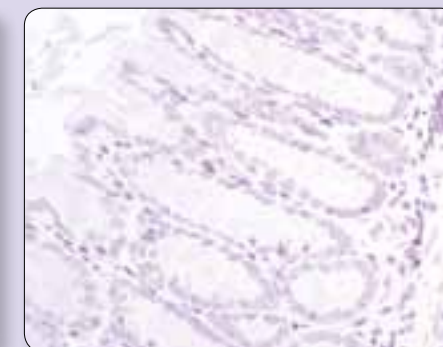
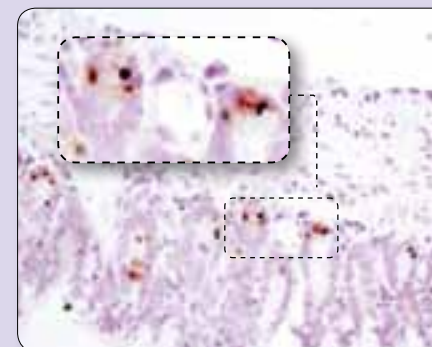
Antibodies Validated for IHC on Mouse Tissue

The development and characterization of mouse models are critical for drug discovery and the advancement of our understanding of basic cancer biology.

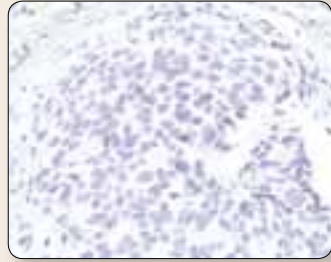
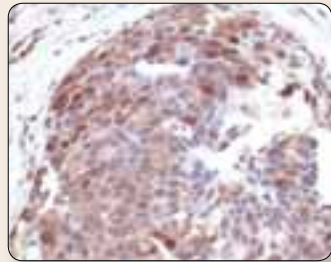
A growing number of antibodies from Cell Signaling Technology (CST) have been validated by our IHC group for use on mouse tissue. CST IHC-validated rabbit monoclonal antibodies demonstrate the exceptional specificity, sensitivity, and performance required for credible results in challenging applications such as IHC, while eliminating problems seen with mouse-on-mouse staining.

For the most up-to-date list of antibodies validated for IHC on mouse tissue, please visit our website.

MMP-7 (D4H5) XP™ Rabbit mAb #3801: IHC analysis of paraffin-embedded mouse small intestine (positive, left) and mouse colon (negative, right), using #3801.



Post-translational Modification-Specific Motifs

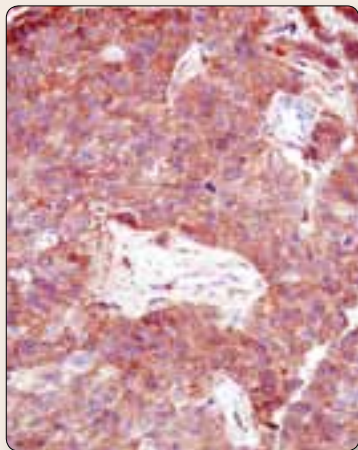


Phospho-(Ser/Thr) Akt Substrate Antibody #9611: IHC analysis of paraffin-embedded human breast carcinoma, control (top) or λ phosphatase-treated (bottom), using #9611.

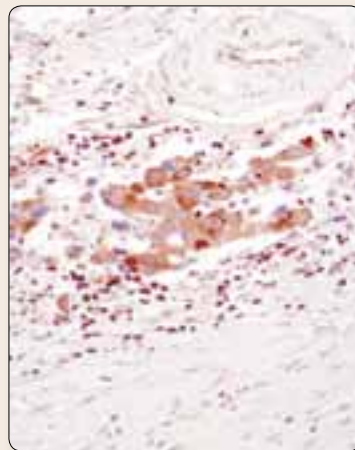
	Applications	Reactivity
#9601 Phospho-(Ser) 14-3-3 Binding Motif Antibody	W, IP, IHC-P, E-P	All
#9614 Phospho-Akt Substrate (RXXS/T) (110B7E) Rabbit mAb	W, IP, IHC-P, E-P	All
#9611 Phospho-(Ser/Thr) Akt Substrate Antibody	W, IP, IHC-P, E-P	All
#2851 Phospho-(Ser/Thr) ATM/ATR Substrate Antibody	W, IP, IHC-P, E-P	All
#2324 Phospho-(Ser) CDKs Substrate Antibody	W, IP, IHC-P, E-P	All
#9441 Acetylated-Lysine Antibody	W, IP, IHC-P, IF-IC, CHIP, E-P	All
#4391 Phospho-MAPK Substrates (PXT) (46G11) Rabbit mAb	W, IP, IHC-P, F, E-P	All
#2325 Phospho-MAPK/CDK Substrates (PXSP or SPXR/K) (34B2) Rabbit mAb	W, IP, IHC-P, E-P	All
#2321 Phospho-(Thr) MAPK/CDK Substrate Mouse mAb	W, IHC-P, E-P	All
#9621 Phospho-(Ser/Thr) PKA Substrate Antibody	W, IP, IHC-P, E-P	All
#2351 Phospho-Threonine-X-Arginine Antibody	W, IHC-P, E-P	All
#9391 Phospho-Threonine-Proline Mouse mAb (P-Thr-Pro-101)	W, IHC-P, E-P	All
#9411 Phospho-Tyrosine Mouse mAb (P-Tyr-100)	W, IP, IHC-P, IF-F, IF-IC, IF-P, F, E-P	All
#9417 Phospho-Tyrosine Mouse mAb (P-Tyr-100) (Biotinylated)	W, IP, IHC-P	All
#9416 Phospho-Tyrosine Mouse mAb (P-Tyr-102)	W, IP, IHC-P, F, E-P	All

Calcium, cAMP, and Lipid Signaling

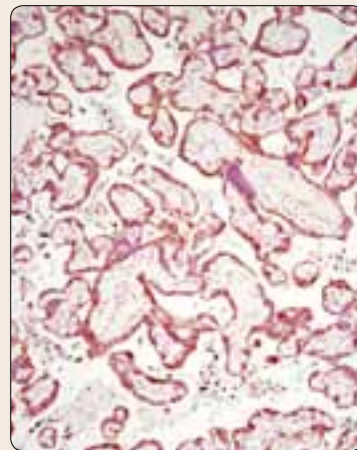
	Applications	Reactivity
#3289 5-Lipoxygenase (C49G1) Rabbit mAb	W, IP, IHC-P	H, (M, R, Mk)
NEW #5607 MARCKS (D88D11) XP™ Rabbit mAb	XP W, IHC-P, IF-IC, F	H, Mk
#9376 Phospho-PKCδ/θ (Ser643/676) Antibody	W, IHC-P	H, M, R, Mk, X
#2059 PKCθ Antibody	W, IHC-P	H, M, R, Mk
#9372 PKCζ Antibody	W, IP, IHC-P	H
NEW #5690 PLCγ1 (D9H10) XP™ Rabbit mAb	XP W, IP, IHC-P	H, M, R, Mk
#3557 TGM2 (D11A6) XP™ Rabbit mAb	XP W, IHC-P, IF-IC	H, M, R, Mk



MARCKS (D88D11) XP™ Rabbit mAb #5607: IHC analysis of paraffin-embedded human breast carcinoma using #5607.



PLCγ1 (D9H10) XP™ Rabbit mAb #5690: IHC analysis of paraffin-embedded human breast carcinoma using #5690.

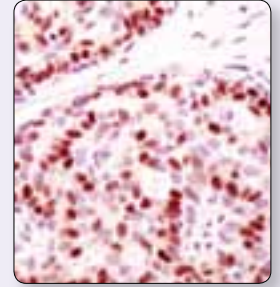


TGM2 (D11A6) XP™ Rabbit mAb #3557: IHC analysis of paraffin-embedded human placenta using #3557.

Other Antibodies

Phosphatases

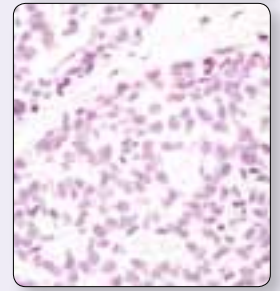
	Applications	Reactivity
#2581 Phospho-PP1α (Thr320) Antibody	W, IHC-P	H, M, R, Mk
#2041 PP2A A Subunit (81G5) Rabbit mAb	W, IHC-P, IF-IC	H, M, R, Mk
#2290 PP2A B Subunit (100C1) Rabbit mAb	W, IP, IHC-P	H, M, R, Mk, Dm, (C, B, Pg)
#4953 PP2A B Subunit Antibody	W, IP, IHC-P, IF-IC, F	H, M, R, Mk, (C)
#2259 PP2A C Subunit (52F8) Rabbit mAb	W, IP, IHC-P, F	H, M, R, Mk, Dm, (C, Pg)
#2038 PP2A C Subunit Antibody	W, IP, IHC-P, IF-IC, F	H, M, R, Mk, Dm, (C, Pg)
#3549 PP2C-α (D18C10) XP™ Rabbit mAb	XP W, IP, IHC-P, IF-IC, F	H, Mk



Progesterone Receptor A/B (C89F7) Rabbit mAb #3153: IHC analysis of paraffin-embedded human breast carcinoma in the presence of control peptide (top) or antigen-specific peptide (bottom) using #3153.

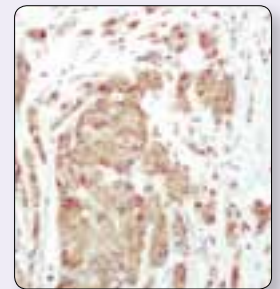
Adaptor Proteins

	Applications	Reactivity
#9638 14-3-3 τ Antibody	W, IHC-P	H, M, R, Mk
#4832 APS Antibody	W, IHC-P	H, M
#3857 β-Arrestin 2 (C16D9) Rabbit mAb	W, IP, IHC-P	H, M, R, Mk
#3181 Phospho-CrkL (Tyr207) Antibody	W, IP, IHC-P, F	H, M, R, Mk
#3992 Gα (pan) Antibody	W, IP, IHC-P	H, M, R, Mk, B



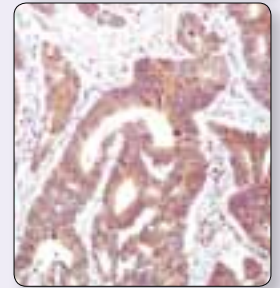
Nuclear Receptors

	Applications	Reactivity
NEW #5153 Androgen Receptor (D6F11) XP™ Rabbit mAb	XP W, IHC-P, IF-IC, F	H
#2511 Phospho-Estrogen Receptor α (Ser118) (16J4) Mouse mAb	W, IHC-P	H
#2435 PPARγ (C26H12) Rabbit mAb	W, IHC-P, IF-IC	H, M, (R)
#3153 Progesterone Receptor A/B (C89F7) Rabbit mAb	W, IHC-P, F	H
#3176 Progesterone Receptor A/B Antibody	W, IHC-P, IF-IC, F	H
#3157 Progesterone Receptor B (C1A2) Rabbit mAb	W, IHC-P, IF-IC, F	H
#2191 SRC-1 (128E7) Rabbit mAb	W, IP, IHC-P	H, M, R, Mk

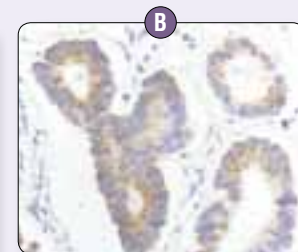
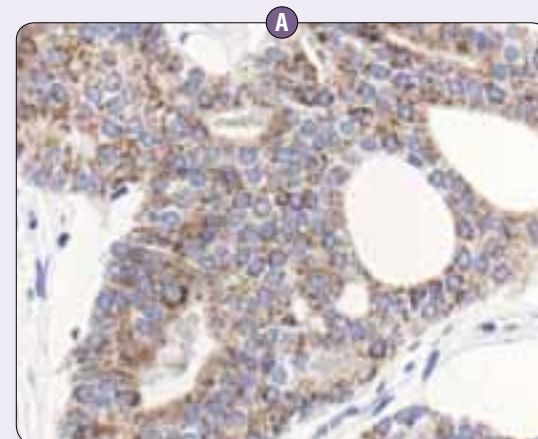


Tag Antibodies

	Applications	Reactivity
#2368 DYKDDDDK Tag Antibody (Binds to same epitope as Sigma's Anti-FLAG® M2 Antibody)	W, IP, IHC-P, IF-IC	All
#2956 GFP (D5.1) XP™ Rabbit mAb	XP W, IHC-P, IF-IC, F	All
#2555 GFP Antibody	W, IHC-P	All
#2955 GFP (4B10) Mouse mAb	W, IHC-P, F	All
#3724 HA-Tag (C29F4) Rabbit mAb	W, IP, IHC-P, IF-IC, F	All
#2367 HA-Tag (6E2) Mouse mAb	W, IHC-P, IF-IC, F	All



PP2C-α (D18C10) XP™ Rabbit mAb #3549: IHC analysis of paraffin-embedded human breast carcinoma (top) and human colon carcinoma (bottom) using #3549.



Gα (pan) Antibody #3992: IHC analysis of paraffin-embedded human prostate carcinoma (A) and colon carcinoma (B) in the presence of control peptide (B) or antigen specific peptide (C), using #3992.

Immunohistochemistry Protocols

Paraffin

***IMPORTANT:** See product datasheet for the appropriate antibody diluent, dilution, and antigen unmasking procedure.

** If the product has not been optimized with this reagent then titration may be required to determine optimal dilution.

A. Solutions and Reagents

1. Xylene
2. Ethanol, anhydrous denatured, histological grade (100% and 95%)
3. Deionized water (dH₂O)
4. Hematoxylin (optional)
5. **Wash Buffer: 1X TBS/0.1% Tween-20 (1X TBST):** To prepare 1 L add 100 ml 10X TBS to 900 ml dH₂O. Add 1 ml Tween-20 and mix.

10X Tris Buffered Saline (TBS): To prepare 1 L add 24.2 g Trizma® base (C₄H₁₁NO₃) and 80 g sodium chloride (NaCl) to 1 L dH₂O. Adjust pH to 7.6 with concentrated HCl.

6. *Antibody Diluent:

a. SignalStain® Antibody Diluent #8112

b. TBST/5% normal goat serum: To 5 ml 1X TBST add 250 µl normal goat serum #5425.

c. PBST/5% normal goat serum: To 5 ml 1X PBST add 250 µl normal goat serum #5425.

1X PBS/0.1% Tween-20 (1X PBST): To prepare 1 L add 100 ml 10X PBS to 900 ml dH₂O. Add 1 ml Tween-20 and mix.

10X Phosphate Buffered Saline (PBS): To prepare 1 L add 80 g sodium chloride (NaCl), 2 g potassium chloride (KCl), 14.4 g sodium phosphate, dibasic (Na₂HPO₄) and 2.4 g potassium phosphate, monobasic (KH₂PO₄) to 1 L dH₂O. Adjust pH to 7.4.

7. *Antigen Unmasking:

a. Citrate: 10 mM Sodium Citrate Buffer: To prepare 1 L add 2.94 g sodium citrate trisodium salt dihydrate (C₆H₅Na₃O₇•2H₂O) to 1 L dH₂O. Adjust pH to 6.0.

b. EDTA: 1 mM EDTA: To prepare 1 L add 0.372 g EDTA (C₁₀H₁₄N₂O₈Na₂•2H₂O) to 1 L dH₂O. Adjust pH to 8.0.

c. TE: 10 mM Tris/1 mM EDTA, pH 9.0: To prepare 1 L add 1.21 g Trizma® base (C₄H₁₁NO₃) and 0.372 g EDTA (C₁₀H₁₄N₂O₈Na₂•2H₂O) to 950 ml dH₂O. Adjust pH to 9.0, then adjust final volume to 1 L with dH₂O.

d. Pepsin: 1 mg/ml in Tris-HCl, pH 2.0.

8. **3% Hydrogen Peroxide:** To prepare, add 10 ml 30% H₂O₂ to 90 ml dH₂O.
9. **Blocking Solution:** TBST/5% normal goat serum #5425: to 5 ml 1X TBST add 250 µl normal goat serum #5425.
10. **Detection System:** Use according to manufacturer's recommendations.
Available from Cell Signaling Technology
SignalStain® Boost IHC Detection Reagent (HRP, Rabbit) #8114**
SignalStain® Boost IHC Detection Reagent (HRP, Mouse) #8125**
11. **DAB Reagent or suitable substrate:** Prepare according to manufacturer's recommendations.

B. Deparaffinization/Rehydration

NOTE: Do not allow slides to dry at any time during this procedure.

1. **Deparaffinize/hydrate sections:**
 - a. Incubate sections in three washes of xylene for 5 minutes each.
 - b. Incubate sections in two washes of 100% ethanol for 10 minutes each.
 - c. Incubate sections in two washes of 95% ethanol for 10 minutes each.
2. Wash sections twice in dH₂O for 5 minutes each.

C. *Antigen Unmasking

NOTE: Consult product datasheet for specific recommendation for the unmasking solution.

1. **For Citrate:** Bring slides to a boil in 10 mM sodium citrate buffer, pH 6.0; maintain at a sub-boiling temperature for 10 minutes. Cool slides on bench top for 30 minutes.
2. **For EDTA:** Bring slides to a boil in 1 mM EDTA, pH 8.0; follow with 15 minutes at a sub-boiling temperature. No cooling is necessary.
3. **For TE:** Bring slides to a boil in 10 mM TE/1 mM EDTA, pH 9.0; maintain at a sub-boiling temperature for 18 minutes. Cool at room temperature for 30 minutes.
4. **For Pepsin:** Digest for 10 minutes at 37°C.

D. Staining

NOTE: Consult product datasheet for recommended antibody diluent and dilution.

1. Wash sections in dH₂O three times for 5 minutes each.
2. Incubate sections in 3% hydrogen peroxide for 10 minutes.
3. Wash sections in dH₂O twice for 5 minutes each.
4. Wash sections in wash buffer for 5 minutes.
5. Block each section with 100–400 µl blocking solution for 1 hour at room temperature.
6. Remove blocking solution and add 100–400 µl primary antibody diluted in recommended antibody diluent to each section. Incubate overnight at 4°C.
7. Remove antibody solution and wash sections in wash buffer three times for 5 minutes each.
8. Perform detection with appropriate detection system per manufacturer's recommendations.
9. Wash sections three times with wash buffer for 5 minutes each.
10. Add 100–400 µl DAB or suitable substrate to each section and monitor staining closely.
11. As soon as the sections develop, immerse slides in dH₂O.
12. If desired, counterstain sections in hematoxylin per manufacturer's instructions.
13. Wash sections in dH₂O two times for 5 minutes each.
14. Dehydrate sections:
 - a. Incubate sections in 95% ethanol two times for 10 seconds each.
 - b. Repeat in 100% ethanol, incubating sections two times for 10 seconds each.
 - c. Repeat in xylene, incubating sections two times for 10 seconds each.
15. Mount coverslips.

Frozen

A. Solutions and Reagents

1. Xylene
2. Ethanol (anhydrous denatured, histological grade 100% and 95%)
3. Hematoxylin (optional)
4. **Fixative:** For optimal fixative, please refer to the product datasheet.
 - a. 10% neutral buffered formalin
 - b. Acetone
 - c. Methanol
 - d. 3% formaldehyde: To prepare, add 18.75 ml 16% formaldehyde to 81.25 ml 1X PBS.
5. **10X Tris Buffered Saline (TBS):** To prepare 1 L add 24.2 g Trizma base (C₄H₁₁NO₃) and 80 g sodium chloride (NaCl) to 1 L dH₂O. Adjust pH to 7.6 with concentrated HCl.
6. **Wash buffer: 1X Tris Buffered Saline (TBS):** To prepare 1 L add 100 ml 10X TBS to 900 ml dH₂O.
7. **Methanol/Peroxidase:** To prepare, add 10 mL 30% H₂O₂ to 90 ml methanol. Store at -20°C.
8. **Blocking Solution:** 1X TBS/0.3% Triton-X 100/5% normal goat serum #5425. To prepare, add 500 µl goat serum and 30 µl Triton-X 100 to 9.5 ml 1X TBS.
9. **Detection System:** Use according to manufacturer's recommendations.
Available from Cell Signaling Technology
SignalStain® Boost IHC Detection Reagent (HRP, Rabbit) #8114**
SignalStain® Boost IHC Detection Reagent (HRP, Mouse) #8125**
10. **DAB Reagent or suitable substrate:** Prepare according to manufacturer's recommendations.

B. Sectioning

1. **For tissue stored at -80°C:** Remove from freezer and equilibrate at -20°C for approximately 15 minutes before attempting to section. This may prevent cracking of the block when sectioning.
2. Section tissue at a range of 6–8 µm and place on positively charged slides.
3. Allow sections to air dry on bench for a few minutes before fixing (this helps sections adhere to slides).

C. Fixation

NOTE: Consult product datasheet to determine the optimal fixative.

1. After sections have dried on the slide, fix in optimal fixative as directed below.
 - a. **10% Neutral buffered formalin:** 10 minutes at room temperature. Proceed with staining procedure immediately.

- b. **Cold acetone:** 10 minutes at -20°C. Air dry. Proceed with staining procedure immediately.
- c. **Methanol:** 10 minutes at -20°C. Proceed with staining procedure immediately.
- d. **3% Formaldehyde:** 15 minutes at room temperature. Proceed with staining procedure immediately.
- e. **3% Formaldehyde/methanol:** 15 minutes at room temperature in 3% formaldehyde, followed by 5 minutes in methanol at -20°C (**do not rinse in between**). Proceed with staining procedure immediately.

D. Staining

NOTE: Consult product datasheet for recommended antibody diluent and dilution.

1. Wash sections in wash buffer twice for 5 minutes.
2. Incubate for 10 minutes at room temperature in 3% H₂O₂ diluted in methanol.
3. Wash sections in wash buffer twice for 5 minutes.
4. Block each section with blocking solution for one hour at room temperature.
5. Remove blocking solution and add 100–400 µl diluted primary antibody to each section. (Dilute antibody in blocking solution). Incubate overnight at 4°C. **Refer to product datasheet to determine the recommended dilution.*
6. Remove antibody solution and wash sections three times with wash buffer for 5 minutes each.
7. Perform detection with appropriate detection system per manufacturer's recommendations.
8. Wash sections three times with wash buffer for 5 minutes each.
9. Add 100–400 µl DAB or suitable substrate to each section and monitor staining closely.
10. As soon as the sections develop, immerse slides in dH₂O.
11. If desired, counterstain sections in hematoxylin per manufacturer's instructions.
12. Wash sections in dH₂O two times for 5 minutes each.
13. Dehydrate sections:
 - a. Incubate sections in 95% ethanol two times for 10 seconds each.
 - b. Repeat in 100% ethanol, incubating sections two times for 10 seconds each.
 - c. Repeat in xylene, incubating sections two times for 10 seconds each.
14. Mount coverslips.



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