

Apoptosis Research

Product Guide



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Apoptosis Research

Product Guide

Apoptosis is a highly regulated, conserved pathway that plays a critical role in development and maintenance of cellular and tissue homeostasis. Cell death can occur via several pathways, including apoptosis, necrosis, and other “emerging” pathways which continue to be the focus of intensive research. Classification of these types of cell death involves a defined set of morphological and/or biochemical criteria affecting the cellular architecture, which in the case of apoptosis, begins with plasma membrane alterations and ultimately results in nuclear degradation. From development of the embryo to uncontrolled proliferation and cancer, apoptosis research continues to be of intense interest.

eBioscience is a leading provider of simple to use, accurate, gold-standard methods to assess apoptosis in your specific workflow, including these key reagents:

- **Inducers of Apoptosis** – Functional antibodies and quality recombinant proteins that can induce apoptosis through multiple death receptors and pathways.
- **Early Apoptotic Markers** – as the leader in multicolor flow cytometry, eBioscience provides the broadest offering of Annexin V, with multiple formats, sizes and configurations.
- **Intermediate Stage Targets** – High performance ELISAs for key molecules in the intracellular signaling cascade, in addition to assessing mitochondrial changes and calcium flux.
- **Late Stage Events** – Gold standard DNA fragmentation (TUNEL) assays Apo-Direct™ and Apo-BrdU™, and reagents for detection of ssDNA in cell and tissue sections.

Functional Reagents for Cell-based Assays

- Overview
- Functional Grade Antibodies
- Recombinant Proteins

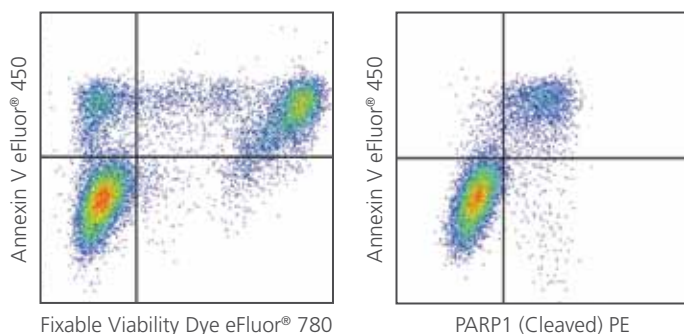
Overview

An intrinsic part of evaluating any biological system is the ability to mimic or inhibit relevant pathways, both at the cellular level and in tissue and whole organism models. Systematic analysis of biologic systems begins with the initiation of cell signaling, typically via receptor-ligand interactions that drive intracellular pathways, cell activation and differentiation, as well as the expression of unique phenotypes and protein expression patterns.

eBioscience offers an expansive list of the highest quality Recombinant Proteins and Functional Grade Antibodies designed for optimal results when used in activation, neutralization, or blocking studies, enabling you to explore these systems with consistent, reproducible results.

Functional Grade Antibodies

eBioscience provides functional antibody products that induce, neutralize or block the natural biologic effects associated with cell signaling and protein-protein interactions. These reagents are provided in appropriate buffers containing better than industry standard low endotoxin and are sodium azide free for *in vivo* or *in vitro* applications.



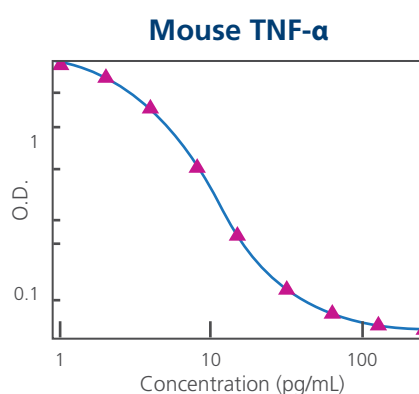
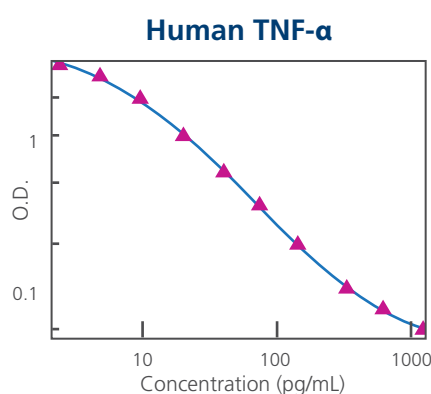
Anti-Human CD95 (Fas) clone EOS 9.1, induces apoptosis in human cells

Jurkat cells were stimulated for 20 hours with Anti-Human CD95 (cat. no. 16-0958) Functional Grade Purified coated at 5 µg/mL in a 24-well culture plate. Stimulated cells were then harvested and stained sequentially with Fixable Viability Dye eFluor®780 (cat. no. 65-0865) and Annexin V Apoptosis Detection Kit eFluor® 450 (cat. no. 88-8006), followed by fixation / permeabilization using Foxp3 Fixation/Permeabilization Buffer (cat. no. 00-5521) and intracellular staining with Anti-Human PARP1 (Cleaved) PE (cat. no. 12-6668). Total cells (left) or viable cells (right) were used for analysis.

Recombinant Proteins

eBioscience provides high quality, QC-validated proteins for cell activation and bioassay protocols, as well as for tissue culture applications. With our own manufacturing facilities, eBioscience is able to offer carrier- and azide-free formats with endotoxin levels better than industry standards for use *in vivo* and *in vitro*. Bulk packaging and sizes are also available upon request. Choose recombinant proteins for cell-based evaluation of apoptosis, including:

- Human, Mouse and Rat TNF- α
- Human TWEAK
- Human soluble Fas Ligand
- Human soluble CD40 Ligand



TNF- α Cytotoxicity

When used *in vitro*, recombinant human (cat. no. 34-8329) and recombinant mouse (cat. no. 34-8321) TNF- α are biologically active and induce cytolysis of mouse L929 cells, a standard assay to assess cytotoxic activity of these proteins.

Antibodies for Cell-based Assays

Description	Clone	Applications	Cat. No.
Anti-Human APO-1/Fas (CD95) Purified	SM1/1	FC, FA	BMS138
Anti-Human APO-1/Fas (CD95) Purified	SM1/23	FC, FA	BMS140
Anti-Human APO-1/Fas (CD95) Functional Grade Purified	EOS9.1	FC, FA	16-0958
Anti-Human Fas Ligand (CD178) Purified	10F2	FC, ELISA, FA	BMS1035
Anti-Human Fas Ligand (CD178) Functional Grade Purified	NOK-1	FC, FA	16-9919
Anti-Mouse Fas Ligand (CD178) Functional Grade Purified	MFL3	FC, FA	16-5911
Anti-Mouse/Rat Fas Ligand (CD178) Functional Grade Purified	MFL4	FC, FA	16-5912
Anti-Human BAFF Receptor (CD268) Functional Grade Purified	8A7	FC, FA	16-9117
Anti-Human Cytochrome c Purified	2G8	FC, ELISA, FA	BMS195
Anti-Human DR5 (CD262) Functional Grade Purified	2A7	FA	16-9907
Anti-Mouse DR5 (CD262) Functional Grade Purified	MD5-1	FC, FA	16-5883
Anti-Mouse Lymphotoxin-beta Receptor Functional Grade Purified	3C8	FC, FA	16-5671



New products are launched regularly.
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Antibodies for Cell-based Assays cont'd

Description	Clone	Applications	Cat. No.
Anti-Human TACI (CD267) Functional Grade Purified	11H3	FC, FA	16-9217
Anti-Human TNF- α Functional Grade Purified	MAB1	ELISA, FA	16-7348
Anti-Mouse TNF- α Functional Grade Purified	MP6-XT22	ELISA, FA, IHC	16-7321
Anti-Mouse TNF- α Functional Grade Purified	1F3F3D4	ELISA	16-7325
Anti-Mouse TNF- α Functional Grade Purified	MP6-XT3	FA	16-7322
Anti-Mouse/Rat TNF- α Functional Grade Purified	TN3-19	FA, FC, ELISA	16-7423
Anti-Mouse CD120a (TNF Receptor I) Functional Grade Purified	55R-170	FA, FC, ELISA	16-1202
Anti-Human TRAIL (CD253) Functional Grade Purified	RIK-2	FC, FA	16-9927
Anti-Mouse TRAIL (CD253) Functional Grade Purified	N2B2	FC, FA	16-5951
Anti-Human TWEAK (CD255) Functional Grade Purified	CARL-1	FC, FA	16-9915
Anti-Mouse TWEAK (CD255) Functional Grade Purified	MTW-1	FC	16-9913
Anti-Human/Mouse TWEAK Receptor (CD266) Functional Grade Purified	ITEM-2	FC, FA	16-9016

Recombinant Proteins for Cell-based Assays

Description	Applications	Cat. No.
Human Activin A Recombinant Protein	FA	14-8993
Human Activin A Recombinant Protein Carrier-Free	FA	34-8993
Human sAPO-1/Fas (CD95) Recombinant Protein	FA	BMS314
Human BAFF, Blys (CD257) Recombinant Protein	FA	14-8943
Human BMP-2 Recombinant Protein	FA	14-8507
Human BMP-2 Recombinant Protein Carrier-Free	FA	34-8507
Mouse HMGB1 Recombinant Protein Carrier-Free	FA	34-8401
Mouse RANK Ligand Recombinant Protein	FA	14-8612
Human TGF β 1 Recombinant Protein	ELISA, FA	14-8348
Human TGF β 1 Recombinant Protein Carrier-Free	FA	34-8348
Human TGF β 2 Recombinant Protein	FA	14-8368
Human TGF β 2 Recombinant Protein Carrier-Free	FA	34-8368
Human TGF β 3 Recombinant Protein	FA	14-8369
Human TGF β 3 Recombinant Protein Carrier-Free	FA	34-8369
Human TNF- α Recombinant Protein	ELISA	BMS301
Human TNF- α Recombinant Protein	ELISA, FA	14-8329
Human TNF- α Recombinant Protein Carrier-Free	ELISA, FA	34-8329
Mouse TNF- α Recombinant Protein	ELISA, FA	14-8321
Mouse TNF- α Recombinant Protein Carrier-Free	FA, ELISA	34-8321
Human TNF- β Recombinant Protein	ELISA	BMS302
Rat TNF- α Recombinant Protein	FA	14-8320
Human TRAIL/APO-2L Recombinant Protein	FA	BMS356
Human TWEAK (CD255) Recombinant Protein	ELISA, FA	14-8916
Human BDNF (brain-derived neurotrophic factor) Recombinant Protein	FA	14-8365


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Supporting Reagents for Cell Activation

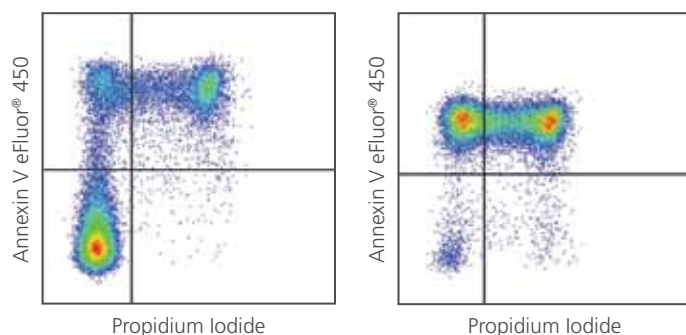
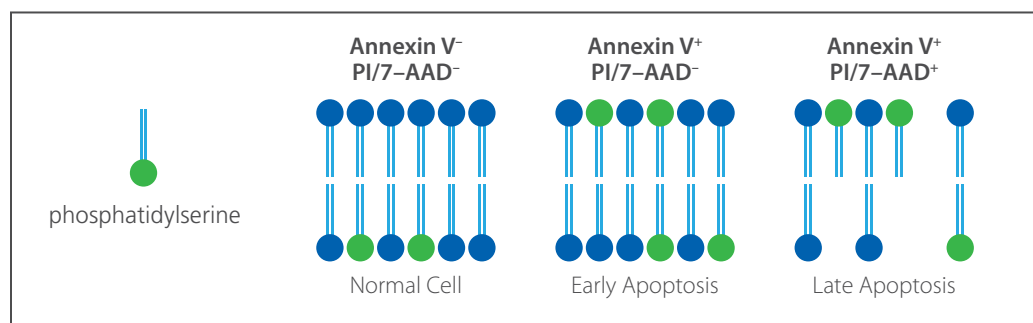
Description	Applications	Cat. No.
Cell Stimulation Cocktail (plus protein transport inhibitors) (500X)	FC, FA	00-4975
Cell Stimulation Cocktail (500X)	FC, ELISA, FA	00-4970
Protein Transport Inhibitor Cocktail (500X)	FC, FA	00-4980

Annexin V Apoptosis Detection Kits

2

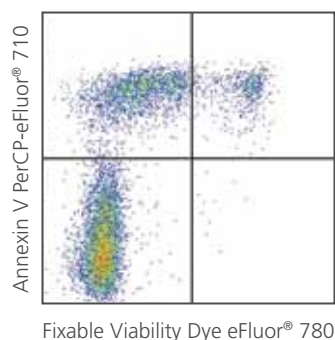
Overview

Annexins are a family of calcium-dependent phospholipid-binding proteins, which bind to phosphatidylserine (PS) to identify apoptotic cells. In healthy cells, PS is predominantly located along the cytosolic side of the plasma membrane. Upon initiation of apoptosis, PS loses its asymmetric distribution in the phospholipid bilayer and translocates to the extracellular membrane, which is detectable with fluorescently labeled Annexin V. In early stages of apoptosis, the plasma membrane excludes viability dyes such as propidium iodide (PI) and 7-AAD, therefore cells which display only Annexin V staining (PI/7-AAD negative) are in early stages of apoptosis. During late-stage apoptosis, loss of cell membrane integrity allows Annexin V binding to cytosolic PS, as well as cell uptake of PI and 7-AAD. Annexin V staining, paired with 7-AAD or PI is widely used to identify apoptotic stages by flow cytometry.



Annexin V eFluor® 450

Mouse thymocytes were prepared as a single cell suspension and incubated overnight at 37°C in medium alone (left) or medium with 1 μ M dexamethasone (right). Cells were harvested and stained using the Annexin V eFluor® 450 Apoptosis Detection Kit (cat. no. 88-8006) and Propidium Iodide Staining Solution (cat. no. 00-6990).



Annexin V PerCP-eFluor® 710

Mouse thymocytes were prepared as a single cell suspension and incubated overnight at 37°C in medium. Cells were harvested and stained using the Annexin V Apoptosis Detection Kit PerCP-eFluor® 710 (cat. no. 88-8008) and Fixable Viability Dye eFluor® 780 (cat. no. 65-0865).

Annexin V Apoptosis Products

Description	Applications	Cat. No.
Annexin V APC Apoptosis Detection Kit	FC	88-8007
Annexin V Biotin Apoptosis Detection Kit	FC	BMS500BT/100
Annexin V Biotin Apoptosis Detection Kit	FC	BMS500BT/300
Annexin V eFluor® 450 Apoptosis Detection Kit	FC	88-8006
Annexin V FITC Apoptosis Detection Kit	FC	88-8005
Annexin V FITC Apoptosis Detection Kit	FC	BMS500FI/300
Annexin V FITC Apoptosis Detection Kit	FC	BMS500FI/100
Annexin V PerCP-eFluor® 710 Apoptosis Detection Kit	FC	88-8008
Annexin V Apoptosis Detection Set PE-Cy7	FC	88-8103
Binding Buffer for Annexin V	FC	BMS500BB
Annexin V Unlabeled Recombinant Protein	FC	BMS306/300UG
Annexin V Unlabeled Recombinant Protein	FC	BMS306/30UG
Annexin V Unlabeled Recombinant Protein	FC	BMS306/1MG
Annexin V APC Recombinant Protein	FC	BMS306APC/100
Annexin V APC Recombinant Protein	FC	BMS306APC/20
Annexin V FITC Recombinant Protein	FC	BMS306FI/100
Annexin V FITC Recombinant Protein	FC	BMS306FI/300
Annexin V Phycoerythrin (PE) Recombinant Protein	FC	BMS306PE/100
Binding Buffer for Annexin V	FC	BMS500BB
Fixable Viability Dye eFluor® 450	FC	65-0863
Fixable Viability Dye eFluor® 506	FC	65-0866
Fixable Viability Dye eFluor® 506/780 Sample Pack	FC	65-2860
Fixable Viability Dye eFluor® 660	FC	65-0864
Fixable Viability Dye eFluor® 780	FC	65-0865
JC-1 Mitochondrial Membrane Potential Dye	FC, IHC	65-0851
Propidium Iodide		BMS500PI

Dyes for Detecting Intracellular Changes During Apoptosis

3

- Mitochondrial Membrane Potential Dye
- Calcium Sensing Dyes
- Dyes to Distinguish Live vs. Apoptotic Cells

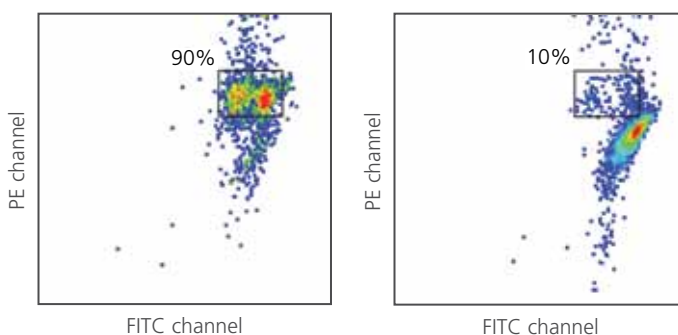
Mitochondrial Membrane Potential Dye

JC-1 is an important tool for determining the loss of mitochondrial membrane potential associated with apoptosis or cell stress. In healthy cells, JC-1 accumulates in mitochondria and subsequently forms aggregates which display red fluorescence. In apoptotic cells, the loss of mitochondrial membrane potential deters the formation of these aggregates, and results in accumulation of green-fluorescent, monomeric JC-1 in the cytoplasm. This visible change from red to green is a valuable, qualitative index of apoptosis for use in fluorescence microscopy.

Qualitative: color change from red (normal) to green (apoptotic).

For quantitative analysis by flow cytometry, particularly in conjunction with other apoptotic indicators such as Annexin V, JC-1 is ideal and is easily measured as a shift in emitted light (JC-1 monomeric form ~530 nm, whereas emission of J-aggregate ~590 nm) when excited at 488 nm.

Quantitative: measure fluorescence intensity by flow cytometry.



JC-1 identifies loss of mitochondrial membrane potential

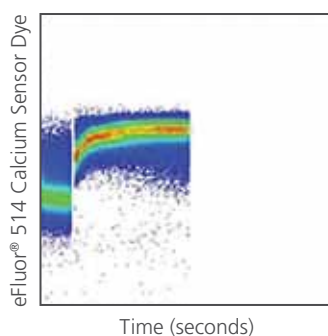
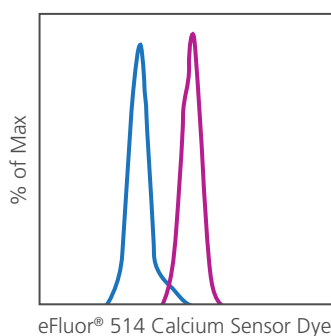
Balb/c thymocytes were kept on ice overnight (left) or cultured overnight at 37°C (right) then stained with JC-1 (cat. no. 65-0851) at 2.5 µg/mL for 10 minutes at room temperature and subsequently stained with Annexin V APC (cat. no. 88-8007). Annexin V positive cells were used for analysis.

Calcium Sensing Dyes

The ability to measure changes in intracellular Ca^{2+} through the use of fluorescent Ca^{2+} indicators has dramatically advanced our understanding of Ca^{2+} signaling in normal cells and disease processes. **Fura-2 AM, Indo-1 AM, and Calcium Sensor Dye eFluor 514** contain acetoxymethyl esters (AM) which allow these dyes to cross the cell membrane for easy loading of live cells. Fura-2 AM and Indo-1 AM are UV excitable Ca^{2+} indicators, while eFluor[®] 514 is excited by visible light.

Fura-2 AM is the preferred dye for ratiometric imaging microscopy with digital image analysis. Upon binding Ca^{2+} , the excitation spectrum of Fura-2 shifts to shorter wavelengths (400 to 300 nm), while its peak emission remains steady (~510 nm). Conversely, Indo-1 AM is a single excitation / dual emission dye. Unbound Indo-1 has a peak emission at 485 nm, which shifts to 410 nm upon Ca^{2+} binding. In flow cytometry, this shift can be measured over time and represented as a ratio of the two emission wavelengths.

Calcium Sensor Dye eFluor 514 is a useful indicator for monitoring changes in intracellular free calcium concentrations using flow cytometry, fluorescence microscopy, fluorescence spectroscopy, or fluorescence microplate readers. In comparison to other visible light-excitable calcium indicators, eFluor 514 provides increased cellular uptake and brightness. Since peak emission (514 nm) and excitation (488 nm) wavelengths do not change upon Ca^{2+} binding, this dye is not recommended for quantitative measurements (calcium binding affinity: $K_d = 232 \text{ nM}$).



Calcium Sensor Dye eFluor[®] 514

Jurkat cells were harvested, washed and loaded with Calcium Sensor Dye eFluor[®] 514 for 30 minutes at 37°C. The left panel shows cells that were washed and analyzed by flow cytometry unstimulated (blue histogram) or stimulated with 1 $\mu\text{g}/\text{mL}$ ionomycin (purple histogram). The right panel shows Jurkat cells loaded with Calcium Sensor Dye eFluor[®] 514 that were acquired on a flow cytometer for 1 minute and then removed for the addition of 1 $\mu\text{g}/\text{mL}$ ionomycin and immediately placed back on the flow cytometer for continued acquisition.

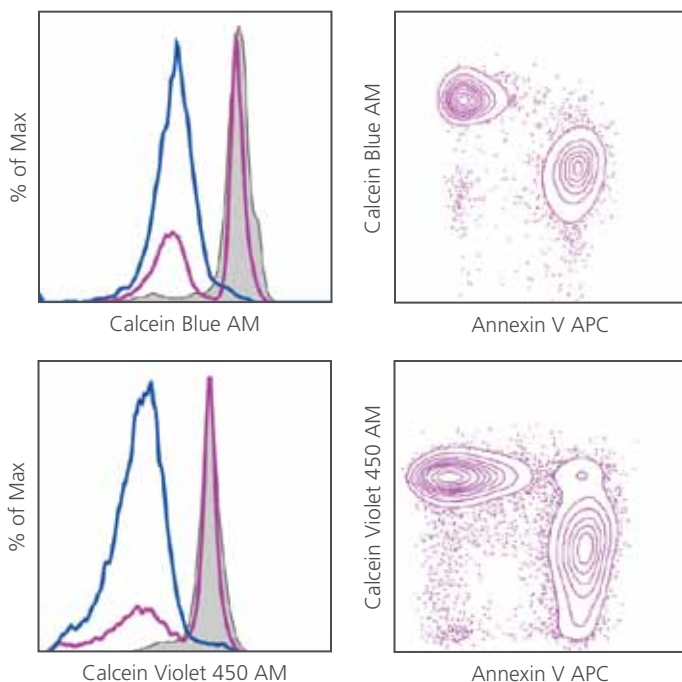
Dyes to Detect Intracellular Changes

Description	Applications	Cat. No.
Calcein AM Viability Dye (UltraPure Grade)	FC, IHC	65-0853
Calcein Blue AM Viability Dye	FC, IHC	65-0855
Calcein Violet 450 AM Viability Dye	FC, IHC	65-0854
Calcium Sensor Dye eFluor [®] 514	FC, IHC	65-0859
Fura-2 AM Dye	FA, IHC	65-0858
Indo-1 AM Calcium Sensor Dye	FC, IHC	65-0856
Indo-1 AM Calcium Sensor Dye (UltraPure Grade)	FC, IHC	65-0857
JC-1 Mitochondrial Membrane Potential Dye	FC, IHC	65-0851
7-AAD Viability Staining Solution	FC	00-6993
Propidium Iodide	FC	BMS500PI
Fixable Viability Dye eFluor [®] 450	FC	65-0863
Fixable Viability Dye eFluor [®] 660	FC	65-0864
Fixable Viability Dye eFluor [®] 780	FC	65-0865

 New products are launched regularly.
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Dyes to Distinguish Live vs. Apoptotic Cells

Calcein AM, Calcein Blue AM and Calcein Violet 450 AM labeling dyes easily cross the cell membrane and selectively label live cells for analysis in flow cytometry or fluorescence microscopy. Calcein AM is non-toxic and may be used for short-term cell tracing. Calcein Blue AM, a UV excited alternative to Calcein AM, has excitation characteristics similar to DAPI, Hoechst, and AMCA dyes. Calcein Violet 450, is a violet laser (405 nm) equivalent to Calcein AM. **Co-stain with Annexin V** for optimal resolution between live and dead / apoptotic cells.



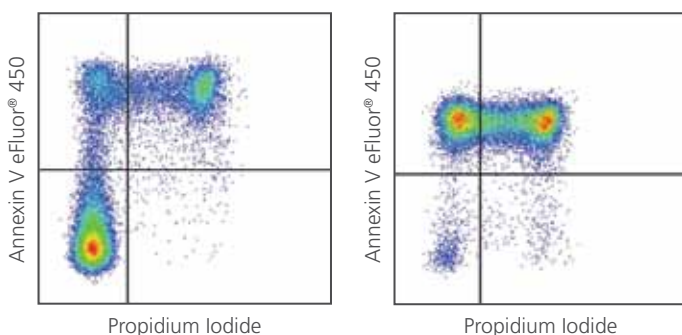
Calcein Blue AM Viability Dye

Balb/c thymocytes were stained with 1 µM Calcein Blue AM (cat. no. 65-0855) for 30 minutes at room temperature (left). Thymocytes were kept on ice overnight (shaded histogram) or cultured overnight at 37°C without (purple) or with (blue) 1 µM dexamethasone. Thymocytes cultured overnight without dexamethasone were also stained with Annexin V APC (cat. no. 88-8007) allowing further discrimination between live and dead cells (right). Total cells were used for analysis.

Calcein Violet 450 AM Viability Dye

Balb/c thymocytes were stained with 1 µM Calcein Violet 450 AM (cat. no. 65-0854) for 30 minutes at room temperature (left). Thymocytes were kept on ice overnight (shaded histogram) or cultured overnight at 37°C without (purple) or with (blue) 1 µM dexamethasone. Thymocytes cultured overnight without dexamethasone were also stained with Annexin V APC (cat. no. 88-8007) allowing further discrimination between live and dead cells (right). Total cells were used for analysis.

Propidium Iodide (PI) and 7-Aminoactinomycin D (7-AAD) are standard reagents used for assessing cell viability and exclusion of non-viable cells in flow cytometry. PI binds to double stranded DNA, but is excluded from cells with intact plasma membranes. PI should be analyzed in the PE channel when used as a counterstain for Annexin V FITC. 7-AAD can be used in place of PI when using Annexin V PE. The advantage of 7-AAD over PI is that there is minimal spectral overlap between these emissions. **Choose propidium iodide** as a counterstain with Annexin V apoptosis assays.



Propidium Iodide

Mouse thymocytes were prepared as a single cell suspension and incubated overnight at 37 °C in medium (left) or medium with 1µM dexamethasone (right). Cells were harvested and stained using the Annexin V Apoptosis Detection Kit eFluor® 450 (cat. no. 88-8006) and Propidium Iodide Staining Solution (cat. no. 00-6990).

Immunoassays for Targets in Apoptotic Signaling

- Overview
 - Instant ELISA® Kits
 - Platinum ELISA Kits
 - InstantOne™ ELISA Kits
-

Overview

eBioscience reagents are trusted by the scientific community worldwide for their high performance and reproducible results. Over a decade of expertise and exacting standards for quality have contributed to the development of our comprehensive Immunoassay portfolio of validated ELISA kits with a reputation for high sensitivity, reproducibility, affordability and innovation.

Instant ELISA® Kits

A major improvement over the traditional sandwich ELISA, the Instant ELISA improves the gold standard by reducing variability, while increasing speed and ease-of-use. The addition of sample is all that is required to start the assay. The Instant ELISA plates contain coating antibody, lyophilized detection antibody, Streptavidin-HRP and sample diluent. Wells containing the ready-to-use standard curve are provided separately.

- **Time Saving** – Only 15 minutes to set up. Simply add sample to begin the assay.
- **Better Value** – Analyze 96 single samples (48 samples in duplicate) per kit. Standard curve data is generated in parallel well strips provided.
- **Built-in Accuracy** – No need to add antibody or do serial dilution of standards. Reduced handling means less error and more consistent results.

Choose Instant ELISA for Human Caspase-3, Human TNF- α , Human TWEAK, and more.

Platinum ELISA Kits

eBioscience's premier pre-coated ELISA kit assays are part of our continuous pursuit to provide the highest quality products. Choose from over 180 Platinum ELISA kits for human, mouse, rat, monkey, and pig target analysis. Stringent in-house development, manufacture and quality validation processes ensure the highest possible ELISA performance. **Choose Platinum ELISA** for Human Bcl-2, Human Caspase-8 and -9, Caspase-3, p53, Human Fas, Human TRAIL, and Cytochrome c.

Immunoassays for Apoptotic Signaling

Description	Applications	Cat. No.
Human Annexin V Platinum ELISA	ELISA	BMS252
Human APRIL Platinum ELISA	ELISA	BMS2008
Human BAFF Instant ELISA	ELISA	BMS2007INST
Human Bcl-2 Platinum ELISA	ELISA	BMS244/3
Human Caspase-3 Instant ELISA®	ELISA	BMS2012INST
Human Caspase-8 Platinum ELISA	ELISA	BMS2024
Human Caspase-9 Platinum ELISA	ELISA	BMS2025
Human sAPO-1/Fas (CD95) Platinum ELISA	ELISA	BMS245
Human sCD27 Instant ELISA	ELISA	BMS286INST
Human sCD30 Platinum ELISA	ELISA	BMS240
Human sCD93 ELISA Ready-SET-Go!®	ELISA	88-50340
Human sCD153 Platinum ELISA	ELISA	BMS298
Human Cytochrome c Platinum ELISA	ELISA	BMS263
Human sFas-L (CD178) Platinum ELISA	ELISA	BMS260/2
Human Granzyme A Platinum ELISA	ELISA	BMS2026
Human Granzyme B Platinum ELISA	ELISA	BMS2027
Human p53 Platinum ELISA	ELISA	BMS256
Human TGFβ1 Platinum ELISA	ELISA	BMS249/3
Human TGFβ2 Platinum ELISA	ELISA	BMS254
Human TNF-α Platinum ELISA	ELISA	BMS223/4
Human TNF-β Platinum ELISA	ELISA	BMS202
Human TNF-β Platinum ELISA	ELISA	BMS202TEN
Human total TNF-α Platinum ELISA	ELISA	BMS2034
Human total TNF-α Platinum ELISA	ELISA	BMS2034TEN
Human TRAIL Platinum ELISA	ELISA	BMS2004
Human TRAIL Platinum ELISA	ELISA	BMS2004TEN
Monkey sTNF-R I Platinum ELISA	ELISA	BMS653
Monkey sTNF-R I Platinum ELISA	ELISA	BMS653TEN
Monkey total TNF-α Platinum ELISA	ELISA	BMS654
Mouse TNF-α Platinum ELISA	ELISA	BMS607/2
Mouse TGFβ1 Platinum ELISA	ELISA	BMS608/3
Rat TNF-α Platinum ELISA	ELISA	BMS622
Rat TGFβ1 Platinum ELISA	ELISA	BMS623/2
Human TNF-α Instant ELISA®	ELISA	BMS223INST
Human TNF-β Instant ELISA®	ELISA	BMS202INST
Human TGFβ1 Instant ELISA®	ELISA	BMS249/2INST
Human TWEAK Instant ELISA®	ELISA	BMS2006INST
Mouse TNF-α Instant ELISA®	ELISA	BMS607/2INST
Monkey sTNF-R I Instant ELISA®	ELISA	BMS653INST
Human TNF-α ELISA High Sensitivity	ELISA	BMS223HS
Human Granzyme B ELISPOT Ready-SET-Go!®	ELISPOT	88-8399
Human TNF-α ELISPOT Ready-SET-Go!®	ELISPOT	88-7398
Mouse TNF-α ELISPOT Ready-SET-Go!®	ELISPOT	88-7328
Mouse Granzyme B ELISA Ready-SET-Go!®	ELISA	88-8022
Human/Mouse TGFβ1 ELISA Ready-SET-Go!®	ELISA	88-8350
Human TNF-α ELISA Ready-SET-Go!®	ELISA	88-7346
Mouse TNF-α ELISA Ready-SET-Go!®	ELISA	88-7324
Rat TNF-α ELISA Ready-SET-Go!®	ELISA	88-7340
Human TNF-β ELISA Ready-SET-Go!®	ELISA	88-7345
Mouse TNF-α ELISA Ready-SET-Go!®	ELISA	88-7324
Rat TNF-α ELISA Ready-SET-Go!®	ELISA	88-7340
Human TNF-β ELISA Ready-SET-Go!®	ELISA	88-7345

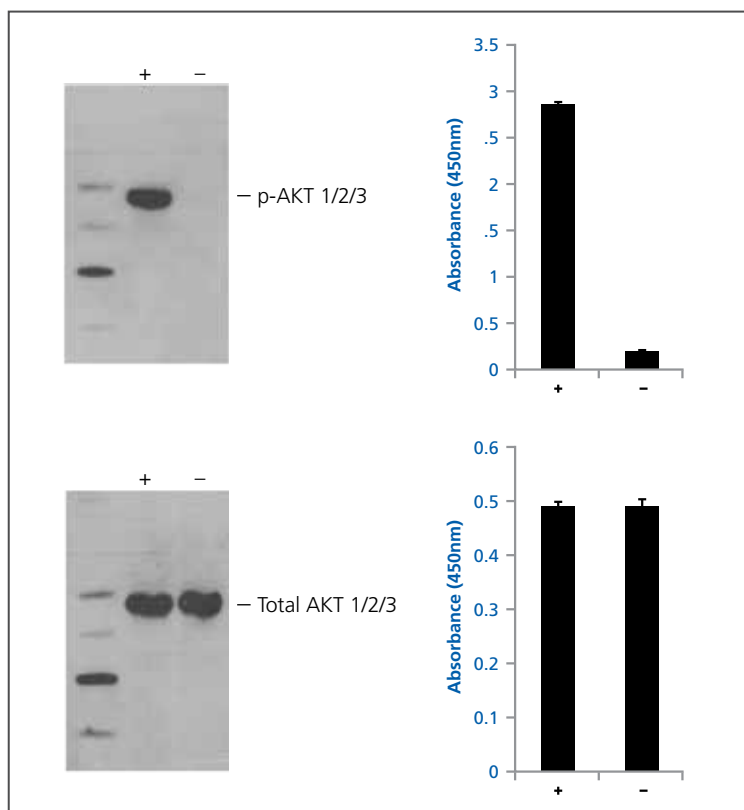
InstantOne™ ELISA Kits

Simple, 1-step ELISA for detecting cell signaling events

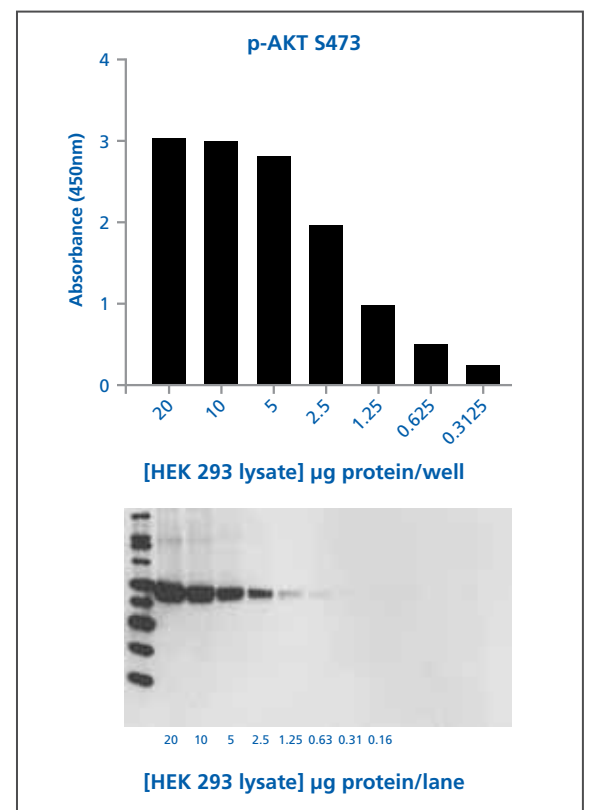
InstantOne represents the next generation in ELISA technology, bringing sensitivity, speed and flexibility to the traditional ELISA format. InstantOne is a colorimetric ELISA that allows rapid detection of cellular proteins. This novel, innovative assay platform has been designed for the detection of protein phosphorylation in a cell-based assay format, allowing you to accurately assess phosphorylation events associated with key targets in apoptosis and cancer research.

- **Sensitive** – Same specificity and sensitivity as 2-step antibody detection system.
- **Fast** – Get results in as little as 1 hour.
- **Simple** – With just 1-step and 1-wash, it is the easiest ELISA in the world.
- **Accurate** – Fewer handling steps than regular ELISA delivers less error and more consistent results.
- **Flexible** – Measure multiple analytes in a single 96-well plate.
- **Uses Most Plate Readers** – Performs colorimetric analysis on standard plate readers.

Choose InstantOne for analysis of phosphoproteins: AKT plays a critical role in cell survival and apoptosis, regulating apoptotic signaling molecules by phosphorylating and thus inactivating pro-apoptotic proteins.



Cells: MCF7 cells (+/-) treated with 10 ng/mL insulin for 10 min (+) or treated with 10uM wortmannin (-). **Analysis:** 10 ug/analysis.



HEK cells are treated with 20% FBS for 15 min prior to lysis.

Immunoassays for Phosphoproteins

Description	Applications	Cat. No.
InstantOne Single Target Kits		
ERK 1/2 (Total)	ELISA	85-86011-11
phospho-ERK 1/2 (Thr202/Tyr204, Thr182/Tyr185)	ELISA	85-86012-11
p38 MAPK (Total)	ELISA	85-86021-11
phospho-p38 MAPK (Thr180/Tyr182)	ELISA	85-86022-11
JNK 1/2/3 (Total)	ELISA	85-86031-11
phospho-JNK 1/2/3 (Thr183/Tyr185)	ELISA	85-86032-11
Phospho AKT 1 (thr308)	ELISA	85-86047-11
AKT 1/2/3 (Total)	ELISA	85-86041-11
phospho-AKT 1/2/3 (Ser473)	ELISA	85-86042-11
p70 S6K (Total)	ELISA	85-86051-11
phospho-p70 S6K (Thr389)	ELISA	85-86052-11
IκBα (Total)	ELISA	85-86061-11
phospho-IκBα (Ser32/36)	ELISA	85-86062-11
Total IKK-α	ELISA	85-86071-11
Phospho IKK-α (ser176/180)	ELISA	85-86072-11
NFκB p65 (Total)	ELISA	85-86081-11
phospho-NFκB p65 (Ser536)	ELISA	85-86082-11
STAT 1 (Total)	ELISA	85-86091-11
phospho-STAT 1 (Tyr701)	ELISA	85-86092-11
STAT3 (Total)	ELISA	85-86101-11
phospho-STAT3 (Tyr705)	ELISA	85-86102-11
STAT5 A/B (Total)	ELISA	85-86111-11
phospho-STAT5 A/B (Tyr694/699)	ELISA	85-86112-11
p53 (Total)	ELISA	85-86121-11
phospho-p53 (Ser15)	ELISA	85-86122-11
GAPDH	ELISA	85-86131-11
InstantOne Total/Phospho Combo Kits		
ERK 1/2 (p44/p42) Total/Phospho Activation Kit ERK 1/2 (Total) phospho-ERK 1/2 (Thr202/Tyr204, Thr182/Tyr185)	ELISA	85-86013-11
p38 Total/Phospho Activation p38 MAPK (Total) phospho-p38 MAPK (Thr180/Tyr182)	ELISA	85-86023-11
JNK Total/Phospho Activation JNK 1/2/3 (Total) phospho-JNK 1/2/3 (Thr183/Tyr185)	ELISA	85-86033-11
Akt Total/Phospho Activation AKT 1/2/3 (Total) phospho-AKT 1/2/3 (Ser473)	ELISA	85-86043-11
p70 S6K Total/Phospho Activation p70 S6K (Total) phospho-p70 S6K (Thr389)	ELISA	85-86053-11
IκBα Total/Phospho Activation IκBα (Total) phospho-IκBα (Ser32/36)	ELISA	85-86063-11
IKKα Total/Phospho Activation kit Total IKK-α phospho IKK-α (ser176/180)	ELISA	85-86073-11
NFκB p65 Total/Phospho Activation NFκB p65 (Total) phospho-NFκB p65 (Ser536)	ELISA	85-86083-11
STAT1 Total/Phospho Activation kit STAT 1 (Total) phospho-STAT 1 (Tyr701)	ELISA	85-86093-11



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Immunoassays for Phosphoproteins cont'd

Description	Applications	Cat. No.
InstantOne Total/Phospho Combo Kits cont'd		
STAT3 Total/Phospho Activation STAT3 (Total) phospho-STAT3 (Tyr705)	ELISA	85-86103-11
STAT5 Total/Phospho Activation STAT5 A/B (Total) phospho-STAT5 A/B (Tyr694/699)	ELISA	85-86113-11
p53 Total/Phospho Activation p53 (Total) phospho-p53 (Ser15)	ELISA	85-86123-11
InstantOne 2 Target Combo Kits		
AKT/ERK Activation Assay phospho-ERK 1/2 (Thr202/Tyr204, Thr182/Tyr185) phospho-AKT 1/2/3 (Ser473)	ELISA	85-86014-11
InstantOne 3 Target Combo Kits		
MAPK Family Phosphorylation Profiler phospho-ERK 1/2 (Thr202/Tyr204, Thr182/Tyr185) phospho-p38 MAPK (Thr180/Tyr182) phospho-JNK 1/2/3 (Thr183/Tyr185)	ELISA	85-86015-11
Erk/Akt/p70 S6K Phosphorylation Profiler phospho-ERK 1/2 (Thr202/Tyr204, Thr182/Tyr185) phospho-AKT 1/2/3 (Ser473) phospho-p70 S6K (Thr389)	ELISA	85-86018-11
AKT Activation Assay AKT 1/2/3 (Total) phospho-AKT 1 (Thr308) phospho-AKT 1/2/3 (Ser473)	ELISA	85-86045-11
STAT Activation Assay phospho-STAT 1 (Tyr701) phospho-STAT3 (Tyr705) phospho-STAT5 A/B (Tyr694/699)	ELISA	85-86095-11
NFkB Activation Assay phospho-IkB α (Ser32/36) phospho IKK α (Ser176/180) phospho-NFkB p65 (Ser536)	ELISA	85-86085-11
AKT Pathway Assay Phospho GSK-3 β (Ser21/9) phospho-AKT 1/2/3 (Ser473) phospho-p70 S6K (Thr389)	ELISA	85-86048-11

DNA Fragmentation Assays

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- Overview
- Apo-Direct™ / Apo-BrdU™ Apoptosis Detection Kits
- APOSTAIN™

Overview

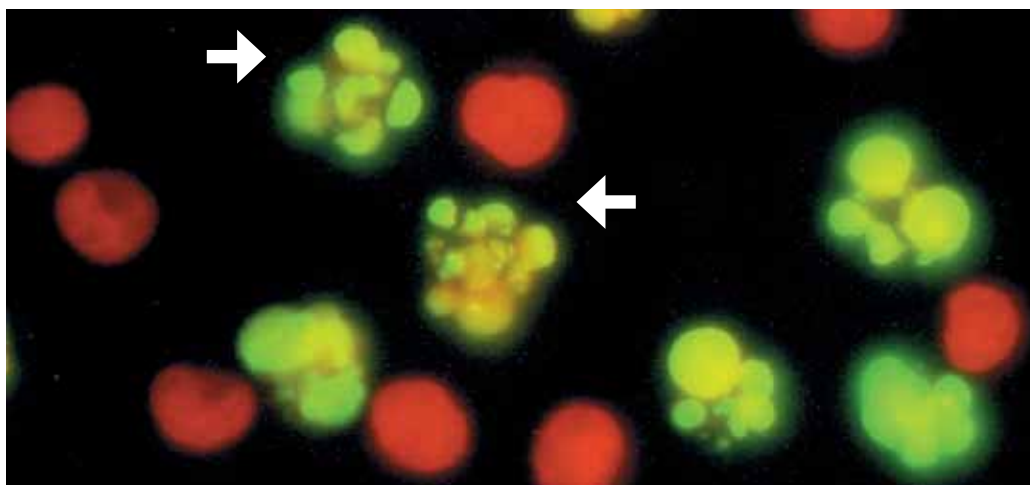
One of the most easily measured features of apoptotic cells is the break-up of genomic DNA by cellular nucleases. The large number of DNA fragments appearing in apoptotic cells results in a multitude of 3'-hydroxyl termini in the DNA. This property can be used to identify apoptotic cells by labeling the 3'-hydroxyl ends with directly conjugated fluorescein-deoxyuridine triphosphate nucleotides (FITC-dUTP). The enzyme terminal deoxynucleotidyl transferase (TdT) catalyzes a template-independent addition of deoxyribonucleoside triphosphates to the 3'-hydroxyl ends of double- or single-stranded DNA with either blunt, recessed or overhanging ends. Terminal deoxynucleotidyl transferase dUTP nick end labeling (TUNEL) is a gold-standard assay for detecting DNA fragmentation by labeling the terminal end of nucleic acids.

Apo-Direct™/Apo-BrdU™ Apoptosis Detection Kits

The Apo-Direct and Apo-BrdU Apoptosis Detection Kits are established assays that utilize a 2-color staining method for labeling DNA breaks and total cellular DNA to detect apoptotic cells by flow cytometry. Each kit contains all the reagents required for measuring apoptosis in your cells, including:

- Positive and negative control cells for assessing reagent performance.
- All necessary buffers for processing individual steps in the assay.
- Terminal deoxynucleotidyl transferase enzyme (TdT).
- FITC-dUTP (Apo-Direct) or Br-dUTP plus FITC-labeled Anti-BrdU (Apo-BrdU).
- Propidium Iodide/RNase A solution for counterstaining the total DNA.

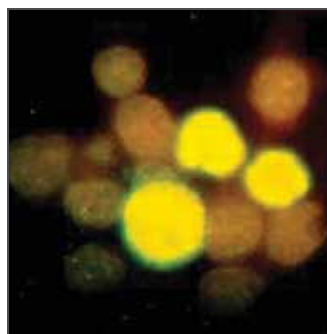
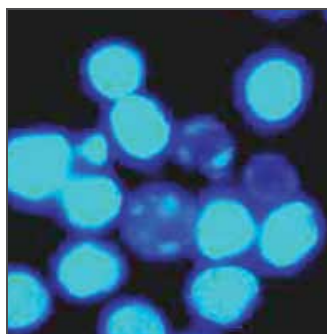
Late-stage Apoptotic Cells



APOSTAIN™

Choose APOSTAIN Anti-ssDNA to specifically stain condensed chromatin of apoptotic cells, a hallmark of apoptosis. Unlike other apoptosis assays and kits, this unique reagent provides specificity based on the high sensitivity of DNA in the condensed chromatin of apoptotic cells to thermal denaturation. Staining of cells and/or tissue sections with APOSTAIN following heat treatment, induces DNA denaturation *in situ* only in apoptotic nuclei. In the presence of formamide, only apoptotic (not necrotic) nuclei DNA becomes denatured and detectable. Thus, APOSTAIN is a specific and sensitive method for the detection of apoptotic cells.

- **Versatile** – Suitable to detect apoptotic cells in various species including mouse, rat and human cells.
- **Specific** – Does not stain non-apoptotic or necrotic cells.
- **Flexible** – Use for flow cytometry and immunohistochemical staining of formalin-fixed paraffin embedded tissue sections.



ICC Staining of Staurosporine-treated MB-MDA-468 cells

Immunocytochemistry of staurosporine-treated MB-MDA-468 cells following formamide incubation and using APOSTAIN Anti-ssDNA followed by Anti-Mouse IgM FITC (cat. no. 11-5890). Paired images of the same field show nuclei counterstained with DAPI (left) and APOSTAIN-positive nuclei (right). Detection of condensed chromatin in three apoptotic cells is clearly visible (right).

References

Frankfurt, O.S. (1994) Detection of apoptotic leukemic and breast cancer cells with monoclonal antibody to single-stranded DNA. *Anticancer Res.* 14:1861-1870. 2) Frankfurt, O.S., Robb J. A., Sugarbaker E. V. and Villa L. (1996) Monoclonal antibody to single-stranded DNA is a specific and sensitive cellular marker of apoptosis *Exp. Cell Res.* 226:387-397. 3) Frankfurt, O. S., Robb, J.A., Sugarbaker E.V., and Villa, L. (1997) Apoptosis in breast carcinomas detected with monoclonal antibody to single-stranded DNA: Relation to bcl-2 expression, hormone receptors and lymph node metastases. *Clin. Cancer Res.* 3:465-471.

Products for DNA Fragmentation

Description	Applications	Cat. No.
Apo-BrdU™ Apoptosis Detection Kit	Flow Cytometry, IHC	88-6671
Apo-Direct™ Apoptosis Detection Kit	Flow Cytometry, IHC	88-6611
APOSTAIN™ Anti-ssDNA	Flow Cytometry, IHC	BMS156



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Quality Antibodies for Apoptosis Research

- Overview
- Internal Cell Signals
- Death Activators
- Caspase-independent Pathway

Overview

Immunofluorescence, immunohistochemistry and immunocytochemistry, in addition to flow cytometry, are useful tools to detect apoptosis. eBioscience is an industry leader providing high quality antibodies conjugated to a variety of fluorophores used to identify key markers for the three mechanisms by which apoptosis occurs involving internal cell signals, death activators, or caspase-independent pathways.

Internal Cell Signals

Human Bcl-2 is the founding member of a family of pro-apoptotic proteins Bcl-xL, Bcl-w, and Mcl-1. Bcl-2, displayed on the surface of healthy cells, plays a role in protecting against apoptosis-inducing events in two ways. Bcl-2 either regulates mitochondrial membrane permeability, resulting in sequestration of Caspase proforms, or prevents the release of apoptosis-mediating mitochondrial factors, such as Cytochrome c and AIF (apoptosis-inducing factor), into the cytoplasm.

Human Bcl-2 in Jurkat Cells (Figure 1)

Lysates prepared under reducing conditions from Jurkat cells, resolved by SDS-PAGE then immunoblotted with Anti-Human Bcl-2 (Bcl-2/100) (cat. no. 14-1028). Bands were visualized using Anti-Mouse IgG HRP. Two isoforms of Bcl-2 (alpha and beta) have been identified as a result of alternative splicing at the C-terminus. The Bcl-2/100 antibody recognizes both forms.

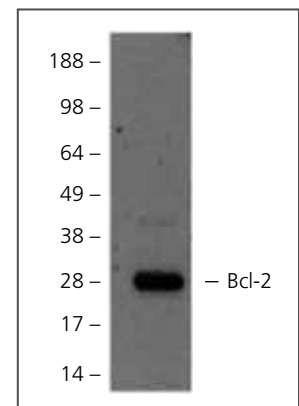


Figure 1

Myeloid cell leukemia-1 (Mcl-1) protein is a 40 kDa Bcl-2 family member expressed in B and T cells, macrophages, neutrophils, and hematopoietic stem cells. Mcl-1 is also expressed in non-immune cells such as fibroblasts, epithelial cells, neuroendocrine cells, chondrocytes, and hepatocytes. Reportedly induced by growth factors and cytokines in normal cells, Mcl-1 expression can be dysregulated in various leukemias and cancer. Mcl-1 mediates cell survival and proliferation by sequestering the pro-apoptotic Bcl-2 proteins Bak, Bax, and Bim. Activity and dimerization of Mcl-1 with Bcl-2 family members is dependent on serine and threonine phosphorylation.

Immunocytochemistry of fixed and permeabilized MCF-7 (Figure 2)

MCF-7 cells were fixed and permeabilized using Mouse IgG1 kappa Isotype Control (cat. no. 14-4714) (top) or Anti-Human Mcl-1 Purified (cat. no. 14-6701) (bottom) followed by Anti-Mouse TRITC. Nuclei are counterstained with DAPI.

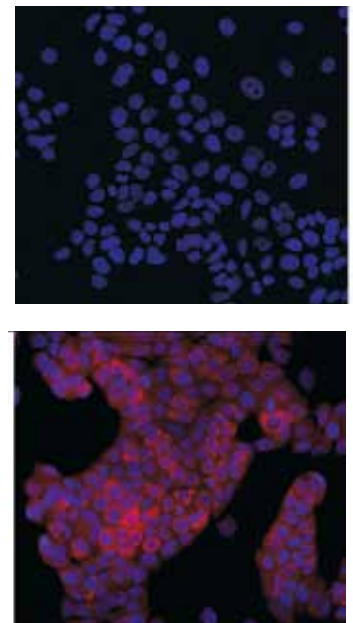
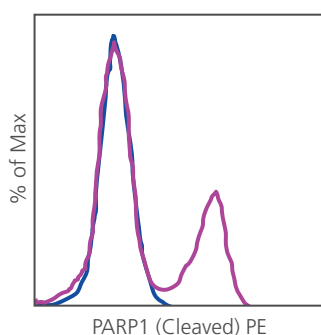
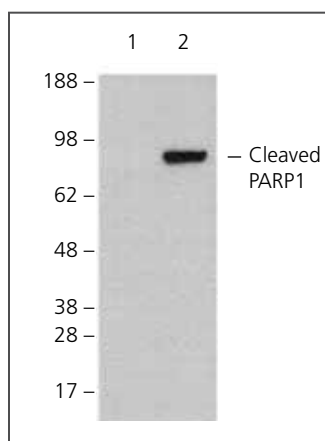


Figure 2

PARP1 Cleavage in Apoptotic Cells: Human poly (ADP-ribose) polymerase (PARP1) is a ubiquitous 116 kDa nuclear enzyme involved in DNA repair. During apoptosis, active Caspases-3, 6 and 7 cleave PARP1 after Asp214, thereby inactivating PARP1 and generating two apoptotic fragments sized at 85 kDa and 25 kDa.

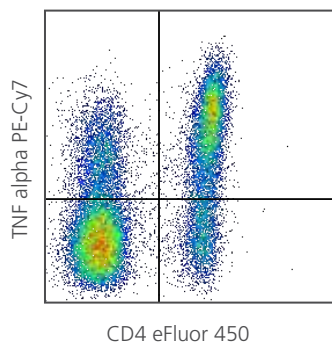
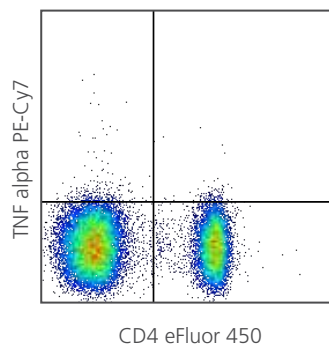


Cell lysates prepared from Jurkat cells left untreated (lane 1) or treated for 2 hrs with Staurosporine (lane 2) were immunoblotted with Anti-Human PARP1 Cleaved Form (cat. no. 14-6668), specific for the cleaved form of human PARP1. Bands were visualized using Anti-Mouse IgG HRP.

Intracellular staining of Jurkat cells stimulated for 2 hrs with Staurosporine (purple histogram) or left unstimulated (blue histogram) with Anti-Human PARP1 PE (cleaved form) (cat. no. 12-6668). Total cells were used for analysis.

Death Activators

The Fas/FasL interaction results in the death-inducing signal complex while TNF is a major mediator of apoptosis. Fas and TNF receptors are integral membrane proteins binding to FasL and TNF, respectively, thereby transmitting signals to the cytoplasm. This interaction activates caspase-8, leading to phagocytosis of the cell.



Anti-Mouse TNF alpha PE-Cy7

Mouse splenocytes were unstimulated (left) or stimulated with Cell Stimulation Cocktail (plus protein transport inhibitors) (cat. no. 00-4975) (right) for 5 hours. Cells were fixed, permeabilized and stained with Anti-Mouse CD4 eFluor[®] 450 (cat. no. 48-0041) and Rat IgG1 K Isotype Control PE-Cy7 (cat. no. 25-4301) or Anti-Mouse TNF alpha PE-Cy7 (cat. no. 25-7321). Viable cells, as determined with Fixable Viability Dye eFluor[®] 780 (cat. no. 65-0865), in the lymphocyte gate were used for analysis.

Caspase-independent Pathway

Apoptosis - inducing factor (AIF) mediates the caspase-independent pathway. Cell death signals implement the release of AIF from the mitochondria where it migrates into the nucleus to induce chromatin condensation and DNA fragmentation. Nuclear translocation of AIF can be inhibited by interaction with members of the heat shock protein 70 family. AIF expression has been reported to be deregulated in cancer cells. AIF mediates caspase-independent programmed cell death in response to numerous stimuli, including hypoxia-ischemia, growth factor deprivation, excitotoxins, and glutamate receptor activation.

Antibodies

Description	Clone	Applications	Cat. No.
Anti-Human Annexin V	VAA-27	ELISA	BMS1031
Anti-Human Annexin V	VAA-33	FC, WB, ELISA	BMS147
Anti-Human Annexin V Biotin	VAA-33	FC	BMS147BT
Anti-Human Annexin V FITC	VAA-33	FC	BMS147FI
Anti-APO-1/ Fas (2R2)	2R2	FC, FA	BMS198
Anti-Human APO-1/Fas (APO 1-1)	APO-1-1	FC, IHC	BMS151
Anti-Human APO-1/Fas-FITC	APO-1-1	FC	BMS151FI
Anti-Human APO-1/Fas-Biotin	APO-1-1	FC	BMS151BT
Anti-Human APO-1/Fas (SM1/1)	SM1/1	FC, FA	BMS138
Anti-Human APO-1/Fas	SM 1-13	FC, ELISA	BMS1030
Anti-Human APO-1/Fas (SM1/23)	SM1/23	FC, FA	BMS140
Anti-Human APO-1/Fas-Biotin	SM1/23	FC	BMS140BT
Anti-Human APO-1/Fas-FITC	SM1/23	FC	BMS140FI
Anti-Apoptosis Inducing Factor (AIF) Purified	Polyclonal	IP, WB, IHC	14-6050
Anti-Human Bax	2D2	IP, WB, IHC, ELISA	BMS162
Anti-Rat Bax Purified	1D1	IP, WB	14-6999
Anti-Human Bcl-2	Bcl-2/100	FC, WB, IHC, ELISA	BMS1028
Anti-Human Bcl-2 Purified	Bcl-2/100	FC, WB, IHC	14-1028
Anti-Human Bcl-2	4D7	FC, IP, WB, IHC, ELISA	BMS1029
Anti-Mouse/Rat Bcl-2 Purified	10C4	IP, WB	14-6992
Anti-Mouse/Rat Bcl-2 FITC	10C4	FC	11-6992
Anti-BrdU PE	BU20A	FC	12-5071
Anti-Human Caspase-3	3-1-11	WB, ELISA	BMS1040
Anti-Human Caspase-8 / FLICCE	4-1-20	ELISA	BMS1102/2
Anti-Human Caspase-9	96-2-2	IP, WB, ELISA	BMS1041
Anti-Human Caspase-9	Polyclonal	IP, WB	BMS1103
Anti-Mouse Caspase-11 PE	17D9	FC	12-9935
Anti-Mouse Caspase-12 Purified	14F7	IP, WB, IHC	14-9950
Anti-Human Chorionic Gonadotropin Purified	FB12	WB, IHC, ELISA, ICC	14-6508
Anti-Human Chorionic Gonadotropin Alexa Fluor® 488	FB12	IHC ,ICC	53-6508
Anti-Human Chorionic Gonadotropin-β Subunit Purified	FBT11	WB, IHC, ELISA, FA, ICC	14-9872
Anti-Cytochrome C Purified	6H2	IP	14-6601
Anti-Cytochrome C FITC	6H2	FC	11-6601
Anti-Human Cytochrome c	2B5	FC, IP, WB, ELISA	BMS1037
Anti-Human Cytochrome c	2B5	FC	BMS1037FI
Anti-Human Cytochrome c	2G8	FC, ELISA, FA	BMS195
Anti-ssDNA (APOSTAIN)	F7-26	FC, IF, IHC	BMS156
Anti-Human DR3 Purified	JD3	FC	14-6603
Anti-Human DR3 Biotin	JD3	FC	13-6603
Anti-Human DR3 PE	JD3	FC	12-6603
Anti-Human Fas Ligand	14C2	ELISA	BMS199/2
Anti-Human Fas-Ligand	10F2	FC, ELISA, FA	BMS1035
Anti-Mouse Fas-Ligand	H-11	FC, WB, IHC	BMS1106
Anti-Human Galectin-3	M3/38	FC, IP, WB, IHC, ELISA	BMS1043
Anti-Human/Mouse Galectin-3 Purified	M3/38	FC, IP, WB, IHC, ELISA	14-5301
Anti-Human/Mouse Galectin-3 Biotin	M3/38	FC	13-5301



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Antibodies

Description	Clone	Applications	Cat. No.
Anti-Human/Mouse Galectin-3 eFluor® 660	M3/38	FC	50-5301
Anti-Human/Mouse Galectin-3 PE	M3/38	FC	12-5301
Anti-Human GM-CSF eFluor® 660	GM2F3	FC	50-7356
Anti-Human GM-CSF PE	GM2F3	FC	12-7356
Anti-Mouse gp49 Receptor Functional Grade Purified	H1.1	FA	16-5784
Anti-Mouse gp49 Receptor eFluor® 660	H1.1	FC	50-5784
Anti-Mouse gp49 Receptor PE	H1.1	FC	12-5784
Anti-Human Granulysin PE	DH2	IHC	12-8828
Anti-Human Granzyme B PE	GB11	FC	12-8899
Anti-Mouse Granzyme B Purified	16G6	WB, ELISA	14-8822
Anti-Mouse Granzyme B Biotin	LU6E	ELISA	13-8821
Anti-Mouse Granzyme B PerCP-eFluor® 710	NGZB	FC	46-8898
Anti-Grim-19 Purified	1A8	WB, IHC, ICC	14-9937
Anti-Grim-19 FITC	1A8	IHC, ICC	11-9937
Anti-Human Heat Shock Protein 27 Purified	STRSN	WB, IHC, ELISA, ICC	14-9112
Anti-HMGB1 Purified	Polyclonal	WB, IHC, ICC	14-9900
Anti-HMGB1 eFluor® 615	Polyclonal	IHC, ICC	42-9900
Anti-Mouse IκB zeta PerCP-eFluor® 710	LK2NAP	FC	46-6801
Anti-Human Mcl-1 Purified	Ab22	WB, ICC	14-6701
Anti-Human NOD2 Purified	2D9	IP, WB, IHC	14-5869
Anti-p21 (WAF1, Cip1) Purified		IP, WB, IHC	14-6715
Anti-PARP Purified	C2-10	IP, WB, IHC, ELISA	14-6666
Anti-Human PARP1 (Cleaved) Alexa Fluor® 488	HLNC4	FC	53-6668
Anti-Human PARP1 (Cleaved) PE	HLNC4	FC	12-6668
Anti-Human Perforin Purified	dG9 (delta G9)	IP, IHC	14-9994
Anti-Human Perforin APC	dG9 (delta G9)	FC	17-9994
Anti-Human Perforin FITC	dG9 (delta G9)	IHC	11-9994
Anti-Human Perforin PE	dG9 (delta G9)	FC	12-9994
Anti-Human Perforin PerCP-eFluor® 710	dG9 (delta G9)	FC	46-9994
Anti-Mouse Perforin APC	OMAK-D	FC	17-9392
Anti-Mouse Perforin FITC	OMAK-D	FC	11-9392
Anti-Mouse Perforin PE	OMAK-D	FC	12-9392
Anti-Mouse PIM-2 Purified	1D12	IP, WB, IHC	14-3308
Anti-Mouse Nur77 PE	12.14	FC	12-5965
Anti-Human/Mouse TL1A PerCP-eFluor® 710	Tandys1a	FC	46-7911
Anti-Human TNF-α	TNF-D	FC, ELISA, FA	BMS154
Anti-Human TNF-α Purified	MAb1	ELISA, ELISPOT	14-7348
Anti-Human TNF-α Functional Grade Purified	MAb1	FA, ELISA, ELISPOT	16-7348
Anti-Human TNF-α Alexa Fluor® 488	MAb11	FC	53-7349
Anti-Human TNF-α Alexa Fluor® 700	MAb11	FC	56-7349
Anti-Human TNF-α APC	MAb11	FC	17-7349
Anti-Human TNF-α Biotin	MAb11	ELISA, ELISPOT	13-7349
Anti-Human TNF-α eFluor® 450	MAb11	FC	48-7349
Anti-Human TNF-α FITC	MAb11	FC	11-7349
Anti-Human TNF-α PE	MAb11	FC	12-7349
Anti-Human TNF-α PE-Cy7	MAb11	FC	25-7349
Anti-Human TNF-α PerCP-Cy5.5	MAb11	FC	45-7349
Anti-Human TNF-α Purified	MAb11	FC	14-7349
Anti-Human TNF-β Purified	359-238-8	FA, ELISA	14-7329



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Antibodies

Description	Clone	Applications	Cat. No.
Anti-Human TNF- β APC	359-81-11	FC	17-7327
Anti-Human TNF- β Biotin	359-81-11	ELISA	13-7327
Anti-Human TNF- β PE	359-81-11	FC	12-7327
Anti-Human TNF- β	LTX-21	FC, WB, IHC, ELISA	BMS105
Anti-Human TNF- β /FITC	LTX-21	FC	BMS105FI
Anti-Human TNF- β	LTX-22	IHC, ELISA	BMS1046
Anti-Mouse TIM1 Purified	RMT1-4	FC	14-5861
Anti-Mouse TIM1 Biotin	RMT1-4	FC	13-5861
Anti-Mouse TIM4 PE	54 (RMT4-54)	FC	12-5866
Anti-Mouse TNF- α Alexa Fluor® 488	MP6-XT22	FC	53-7321
Anti-Mouse TNF- α APC	MP6-XT22	FC	17-7321
Anti-Mouse TNF- α Cy5	MP6-XT22	FC	19-7321
Anti-Mouse TNF- α eFluor® 450	MP6-XT22	FC	48-7321
Anti-Mouse TNF- α FITC	MP6-XT22	FC	11-7321
Anti-Mouse TNF- α Functional Grade Purified	MP6-XT22	FA	16-7321
Anti-Mouse TNF- α PE	MP6-XT22	FC	12-7321
Anti-Mouse TNF- α PerCP-eFluor® 710	MP6-XT22	FC	46-7321
Anti-Mouse TNF- α Purified	MP6-XT22	IHC	14-7321
Anti-Mouse TNF- α Functional Grade Purified	MP6-XT3	FA	16-7322
Anti-Mouse TNF- α Biotin	XT3/XT22	ELISA	13-7326
Anti-Mouse TNF- α Functional Grade Purified	1F3F3D4	ELISPOT	16-7325
Anti-Mouse TNF- α Purified	1F3F3D4	ELISPOT, ELISA	14-7325
Anti-Mouse TNF- α	1F3F3D4	ELISA, FA	BMS177
Anti-Mouse/Rat TNF- α Purified	Polyclonal	FA	14-7341
Anti-Mouse/Rat Receptor Interacting Protein 3 (RIP3) Purified	Polyclonal	WB, IHC	14-6048
Anti-Mouse/Rat TNF- α Biotin	Polyclonal	ELISA, ELISPOT	13-7341
Anti-Mouse/Rat TNF- α eFluor® 660	TN3-19	FC	50-7423
Anti-Mouse/Rat TNF- α FITC	TN3-19	FC	11-7423
Anti-Mouse/Rat TNF- α Functional Grade Purified	TN3-19	FA	16-7423
Anti-Mouse/Rat TNF- α Functional Grade Biotin	TN3-19	FA	36-7423
Anti-Mouse/Rat TNF- α Purified	TN3-19	FA, ELISA	14-7423
Anti-Mouse/Rat TNF- α PE	TN3-19	FC	12-7423
Anti-Mouse/Rat TNF- α PE-Cy7	TN3-19	FA, ELISA	25-7423
Anti-Rat TNF- α	Polyclonal	WB, ELISA, FA	BMS175
Anti-Ubiquitin Purified	P4D1	IP, WB, IHC	14-6078
Anti-Universal Bax	6A7	IP, WB, IHC, ELISA	BMS163
Anti-XIAP Purified	Polyclonal	IP, WB, IHC	14-6047
Anti-CD27 Purified	LG.7F9	FC, IP, FA	14-0271
Anti-CD27 APC	LG.7F9	FC	17-0271
Anti-CD27 APC-eFluor® 780	LG.7F9	FC	47-0271
Anti-CD27 Biotin	LG.7F9	FC	13-0271
Anti-CD27 FITC	LG.7F9	FC	11-0271
Anti-CD27 Functional Grade Purified	LG.7F9	FC, FA	16-0271
Anti-CD27 PE	LG.7F9	FC	12-0271
Anti-CD27 PE-Cy7	LG.7F9	FC	25-0271
Anti-CD27 PerCP-eFluor® 710	LG.7F9	FC	46-0271
Anti-Human CD27 APC	O323	FC	17-0279
Anti-Human CD27 APC-eFluor® 780	O323	FC	47-0279
Anti-Human CD27 Alexa Fluor® 700	O323	FC	56-0279



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Description	Clone	Applications	Cat. No.
Anti-Human CD27 Biotin	O323	FC	13-0279
Anti-Human CD27 eFluor® 450	O323	FC	48-0279
Anti-Human CD27 eFluor® 650NC	O323	FC	95-0279
Anti-Human CD27 FITC	O323	FC	11-0279
Anti-Human CD27 PE	O323	FC	12-0279
Anti-Human CD27 PE-Cy5	O323	FC	15-0279
Anti-Human CD27 PE-Cy7	O323	FC	25-0279
Anti-Human CD27 PerCP-eFluor® 710	O323	FC	46-0279
Anti-Human CD27 Purified	O323	FC	14-0279
Anti-Human/Mouse CD27 Functional Grade Purified	LG.3A10	FC, IHC, FA	16-0272
Anti-Human/Mouse CD27 Purified	LG.3A10	FC, IP, IHC	14-0272
Anti-Human CD30	Ki-2	FC, IP, WB, ELISA	BMS1024
Anti-Human CD30	Ki-3	FC, ELISA	BMS1025
Anti-Human CD30 PE	Ber-H2	FC	12-0309
Anti-Human CD30 Purified	Ber-H2	FC, IHC	14-0309
Anti-Mouse CD30 Biotin	mCD30.1	FC	13-0301
Anti-Mouse CD30 Functional Grade Purified	mCD30.1	FC, FA	16-0301
Anti-Mouse CD30 PE	mCD30.1	FC	12-0301
Anti-Mouse CD30 Purified	mCD30.1	FC, FA	14-0301
Anti-Human CD93 Biotin	R3	FC, ELISA	13-0938
Anti-Human CD93 Purified	R139	FC, IP, WB, ELISA	14-0939
Anti-Mouse CD93 (AA4.1) APC	AA4.1	FC	17-5892
Anti-Mouse CD93 (AA4.1) Biotin	AA4.1	FC	13-5892
Anti-Mouse CD93 (AA4.1) FITC	AA4.1	FC	11-5892
Anti-Mouse CD93 (AA4.1) PE	AA4.1	FC	12-5892
Anti-Mouse CD93 (AA4.1) PE-Cy7	AA4.1	FC	25-5892
Anti-Mouse CD93 (AA4.1) PerCP-Cy5.5	AA4.1	FC	45-5892
Anti-Mouse CD93 (AA4.1) Purified	AA4.1	FC, IHC	14-5892
Anti-Human CD95 (APO-1/Fas) APC	DX2	FC	17-0959
Anti-Human CD95 (APO-1/Fas) Biotin	DX2	FC	13-0959
Anti-Human CD95 (APO-1/Fas) eFluor® 450	DX2	FC	48-0959
Anti-Human CD95 (APO-1/Fas) FITC	DX2	FC	11-0959
Anti-Human CD95 (APO-1/Fas) PE	DX2	FC	12-0959
Anti-Human CD95 (APO-1/Fas) PE-Cy5	DX2	FC	15-0959
Anti-Human CD95 (APO-1/Fas) PE-Cy7	DX2	FC	25-0959
Anti-Human CD95 (APO-1/Fas) PerCP-eFluor® 710	DX2	FC	46-0959
Anti-Human CD95 (APO-1/Fas) Purified	DX2	FC, IHC, FA	14-0959
Anti-Human CD95 (APO-1/Fas) Functional Grade Purified	EOS9.1	FC, FA	16-0958
Anti-Human CD95 (APO-1/Fas) Purified	EOS9.1	FC, FA	14-0958
Anti-Mouse CD95 (APO-1/Fas) Alexa Fluor® 488	15A7	FC	53-0951
Anti-Mouse CD95 (APO-1/Fas) APC	15A7	FC	17-0951
Anti-Mouse CD95 (APO-1/Fas) Biotin	15A7	FC	13-0951
Anti-Mouse CD95 (APO-1/Fas) PE	15A7	FC	12-0951
Anti-Mouse CD95 (APO-1/Fas) Purified	15A7	FC	14-0951
Anti-Human CD99 FITC	3B2/TA8	FC	11-0997
Anti-Human CD99 PE	3B2/TA8	FC	12-0997
Anti-Mouse CD120a (TNF Receptor I) Functional Grade Purified	55R-170	FA	16-1202
Anti-Human CD178 (CD95 Ligand) Biotin	NOK-1	FC	13-9919
Anti-Human CD178 (CD95 Ligand) Functional Grade Purified	NOK-1	FC, FA	16-9919



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Description	Clone	Applications	Cat. No.
Anti-Human CD178 (CD95 Ligand) PE	NOK-1	FC	12-9919
Anti-Human CD178 (CD95 Ligand) Purified	NOK-1	FC, IP, FA	14-9919
Anti-Mouse CD178 (Fas Ligand) Biotin	MFL3	FC	13-5911
Anti-Mouse CD178 (Fas Ligand) FITC	MFL3	FC	11-5911
Anti-Mouse CD178 (Fas Ligand) Functional Grade Purified	MFL3	FC, FA	16-5911
Anti-Mouse CD178 (Fas Ligand) PE	MFL3	FC	12-5911
Anti-Mouse CD178 (Fas Ligand) PE-Cy7	MFL3	FC	25-5911
Anti-Mouse CD178 (Fas Ligand) PerCP-eFluor® 710	MFL3	FC	46-5911
Anti-Mouse CD178 (Fas Ligand) Purified	MFL3	FC, FA	14-5911
Anti-Mouse/Rat CD178 (Fas Ligand) Functional Grade Purified	MFL4	FC, FA	16-5912
Anti-Mouse/Rat CD178 (Fas Ligand) Purified	MFL4	FC, FA	14-5912
Anti-Human CD180 (RP105) Biotin	MHR73-11	FC	13-1809
Anti-Human CD180 (RP105) Functional Grade Purified	MHR73-11	FC, FA	16-1809
Anti-Human CD180 (RP105) PE	MHR73-11	FC	12-1809
Anti-Human CD180 (RP105) Purified	MHR73-11	FC, IP, IHC, FA	14-1809
Anti-Mouse CD180 (RP105) Functional Grade Purified	RP/14	FC, FA	16-1801
Anti-Mouse CD180 (RP105) PE	RP/14	FC	12-1801
Anti-Mouse CD180 (RP105) Purified	RP/14	FC, IP, FA	14-1801
Anti-Human CD253 (TRAIL) Biotin	RIK-2	FC	13-9927
Anti-Human CD253 (TRAIL) Functional Grade Purified	RIK-2	FC, FA	16-9927
Anti-Human CD253 (TRAIL) PE	RIK-2	FC	12-9927
Anti-Human CD253 (TRAIL) Purified	RIK-2	FC, FA	14-9927
Anti-Mouse CD253 (TRAIL) Biotin	N2B2	FC	13-5951
Anti-Mouse CD253 (TRAIL) Functional Grade Purified	N2B2	FC, FA	16-5951
Anti-Mouse CD253 (TRAIL) PE	N2B2	FC	12-5951
Anti-Mouse CD253 (TRAIL) Purified	N2B2	FC, IP, FA	14-5951
Anti-Human CD254 (RANK Ligand) Purified	MIH24	FC, ELISA	14-6619
Anti-Human CD254 (RANK Ligand) Biotin	MIH24	FC, ELISA	13-6619
Anti-Human CD254 (RANK Ligand) PE	MIH24	FC	12-6619
Anti-Human CD254 (RANK Ligand) Purified	MIH23	FC, ELISA	14-6617
Anti-Mouse CD254 (RANK Ligand) Biotin	IK22/5	FC	13-5952
Anti-Mouse CD254 (RANK Ligand) Functional Grade Purified	IK22/5	FC, FA	16-5952
Anti-Mouse CD254 (RANK Ligand) PE	IK22/5	FC	12-5952
Anti-Mouse CD254 (RANK Ligand) Purified	IK22/5	FC, FA	14-5952
Anti-Mouse CD255 (TWEAK) Biotin	MTW-1	FC	13-9913
Anti-Mouse CD255 (TWEAK) PE	MTW-1	FC	12-9913
Anti-Human CD255 (TWEAK) Functional Grade Purified	CARL-1	FC, FA	16-9915
Anti-Human CD255 (TWEAK) Purified	CARL-2	FA, ELISA	14-9916
Anti-Human CD261 (DR4) Biotin	DJR1	FC	13-6644
Anti-Human CD261 (DR4) PE	DJR1	FC	12-6644
Anti-Human CD261 (DR4) Purified	DJR1	FC, IHC	14-6644
Anti-Human CD262 (DR5) Biotin	DJR2-4 (aka7-8)	FC	13-9908
Anti-Human CD262 (DR5) PE	DJR2-4 (aka7-8)	FC	12-9908
Anti-Human CD262 (DR5) Purified	DJR2-4 (aka7-8)	FC	14-9908
Anti-Human CD262 (DR5) Purified	DJR2-2 (aka 2-6)	FC, WB	14-9909
Anti-Human CD262 (DR5) Functional Grade Purified	2A7	FA	16-9907
Anti-Mouse CD262 (DR5) Biotin	MD5-1	FC	13-5883
Anti-Mouse CD262 (DR5) Functional Grade Purified	MD5-1	FC, FA	16-5883
Anti-Mouse CD262 (DR5) PE	MD5-1	FC	12-5883



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Description	Clone	Applications	Cat. No.
Anti-Mouse CD262 (DR5) Purified	MD5-1	FC, FA	14-5883
Anti-Human CD263 (TRAIL-R3) Biotin	DJR3	FC	13-6238
Anti-Human CD263 (TRAIL-R3) PE	DJR3	FC	12-6238
Anti-Human CD266 (TWEAK Receptor) PE	ITEM-1	FC	12-9019
Anti-Human CD266 (TWEAK Receptor) Purified	ITEM-1	FC, IHC, FA	14-9019
Anti-Human/Mouse CD266 (TWEAK Receptor) Biotin	ITEM-4	FC	13-9018
Anti-Human/Mouse CD266 (TWEAK Receptor) PE	ITEM-4	FC	12-9018
Anti-Human/Mouse CD266 (TWEAK Receptor) Purified	ITEM-4	FC, WB, IHC	14-9018
Anti-Human CD279 (PD-1) APC	J105	FC	17-2799
Anti-Human CD279 (PD-1) APC-eFluor® 780	J105	FC	47-2799
Anti-Human CD279 (PD-1) Biotin	J105	FC	13-2799
Anti-Human CD279 (PD-1) eFluor® 650NC	J105	FC	95-2799
Anti-Human CD279 (PD-1) PE	J105	FC	12-2799
Anti-Human CD279 (PD-1) PE-Cy7	J105	FC	25-2799
Anti-Human CD279 (PD-1) PerCP-eFluor® 710	J105	FC	46-2799
Anti-Human CD279 (PD-1) Purified	J105	FC, IP, IHC	14-2799
Anti-Human CD279 (PD-1) Functional Grade Purified	J116	FA	16-9989
Anti-Human CD279 (PD-1) Purified	J116	IP, WB, IHC, FA	14-9989
Anti-Human CD279 (PD-1) FITC	MIH4	FC	11-9969
Anti-Human CD279 (PD-1) APC	MIH4	FC	17-9969
Anti-Human CD279 (PD-1) PE	MIH4	FC	12-9969
Anti-Human CD279 (PD-1) PerCP-eFluor® 710	MIH4	FC	46-9969
Anti-Human CD279 (PD-1) Purified	MIH4	FC, IHC	14-9969
Anti-Mouse CD279 (PD-1) Biotin	J43	FC	13-9985
Anti-Mouse CD279 (PD-1) APC	J43	FC	17-9985
Anti-Mouse CD279 (PD-1) FITC	J43	FC	11-9985
Anti-Mouse CD279 (PD-1) Functional Grade Purified	J43	FC, FA	16-9985
Anti-Mouse CD279 (PD-1) PE	J43	FC	12-9985
Anti-Mouse CD279 (PD-1) PE-Cy7	J43	FC	25-9985
Anti-Mouse CD279 (PD-1) PerCP-eFluor® 710	J43	FC	46-9985
Anti-Mouse CD279 (PD-1) Purified	J43	FC, IP, IHC	14-9985
Anti-Mouse CD279 (PD-1) Functional Grade Purified	RMP1-14	FC, FA	16-9982
Anti-Mouse CD279 (PD-1) Purified	RMP1-14	FC, FA	14-9982
Anti-Mouse CD279 (PD-1) APC	RMP1-30	FC	17-9981
Anti-Mouse CD279 (PD-1) Biotin	RMP1-30	FC	13-9981
Anti-Mouse CD279 (PD-1) eFluor® 450	RMP1-30	FC	48-9981
Anti-Mouse CD279 (PD-1) FITC	RMP1-30	FC	11-9981
Anti-Mouse CD279 (PD-1) Functional Grade Purified	RMP1-30	FC	16-9981
Anti-Mouse CD279 (PD-1) PerCP-eFluor® 710	RMP1-30	FC	46-9981
Anti-Mouse CD279 (PD-1) Purified	RMP1-30	FC	14-9981
Anti-Mouse CD279 (PD-1) PE	RMP1-30	FC	12-9981

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