

Quantikine® Human Cystatin C ELISA

Cystatin C is a 13 kDa extracellular cysteine protease inhibitor that belongs to the cystatin superfamily. Its major targets are cysteine proteases of the papain family. Cystatin C is produced in all tissues and is present in all biological fluids. Through regulating cysteine protease activity, it participates in many physiological and pathophysiological processes including inflammation and tumor metastasis.¹ Cystatin C has been found to have utility as a biomarker for renal function assessment.^{2,3} Unlike creatinine, the renal marker used in current clinical practice, cystatin C serum concentration correlates closely to the glomerular clearance rate, with no influence by other factors such as gender, age, and muscle mass.^{2,3}

The Quantikine human Cystatin C Immunoassay (Catalog # DSCTC0) is a 4.5 hour solid phase ELISA designed to measure cystatin C in cell culture supernatant, serum, plasma, saliva, urine, and milk. This assay has a sensitivity of 0.1 ng/mL and has no cross reactivity with other cystatins or cathepsins.

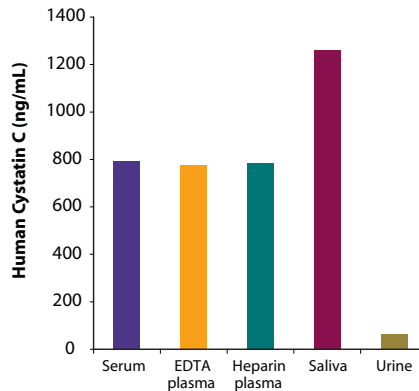


Figure 1. R&D Systems Quantikine Cystatin C ELISA Kit (Catalog # DSCTC0) is validated for use with several biological fluids. The graph illustrates cystatin C levels in human serum, EDTA plasma, heparin plasma, saliva, and urine.

References

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2. Reed, C.H. (2000) *British J. Biomed. Sci.* **57**:323.
3. Laterza, O.F. *et al.* (2002) *Clin. Chem.* **48**:699.

ELISA & Activity Assay Kits

Analyte	Species	Sensitivity	Range	Catalog #	Size
C-Reactive Protein	Human	0.022 ng/mL	0.78-50 ng/mL	DCRP00	1 Kit
Cystatin C	Human	0.1 ng/mL	3.12-1000 ng/mL	DSCTC0	1 Kit
EGF	Mouse	1.6 pg/mL	7.8-500 pg/mL	MEG00	1 Kit
IL-20	Mouse	6.4 pg/mL	15.6-100 pg/mL	ML200	1 Kit
Thrombospondin-2	Human	0.068 ng/mL	0.31-20 ng/mL	DTSP20	1 Kit

ELISA & Activity Assay Development Kits

DuoSet® ELISA Development Systems

Analyte	Species	Catalog #	Reagents For*
B7-1/CD80	Mouse	DY740	15 Plates
IL-17 R	Human	DY177	15 Plates
TACI/TNFRSF13B	Human	DY174	15 Plates

*Also available in 45 plate Economy packs.

DuoSet IC (Intracellular) ELISAs & Activity Assays

Analyte	Species	Catalog #	Reagents For*
Total Bcl-2	Human	DYC827B-2	2 Plates
Phospho-gp130	Human	DYC3407-2	2 Plates

*Also available in 5 plate packs and 15 plate Economy Packs.

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Fluorochrome-conjugated antibodies to the p53 tumor suppressor



Quality | Selection | Performance | Results

Interleukin-33

The IL-1 family of molecules continues to grow in number and function. All share a common β -trefoil structure, and members now appear to mediate a variety of effects that generally are proinflammatory and cell-mediated. Until recently, all but one identified member of the IL-1 family were encoded by genes that were linked to the IL-1 gene cluster on human chromosome 2. The notable exception was IL-18, an unusual cytokine in that it strongly promotes Th1-type responses, yet seems to play a very minimal role in Th1 cell development.

Now a new member of the IL-1 family has been reported, IL-33/IL-1F11.¹ Like other family members, it has a β -trefoil structure and binds to a long-known IL-1 receptor family member termed ST2/IL-33R α .¹⁻³ Remarkably, it would appear to be a matched counterpart to IL-18. Both molecules have genes distant from the IL-1 complex, both have a caspase-cleavable prodomain, and both drive T helper cell activity following Th commitment, with IL-18 impacting Th1 cells and IL-33 driving Th2 cells.^{1,4} In particular, IL-33 seems to promote IL-5 and IL-13 secretion, resulting in increased immunoglobulin production and eosinophil release.^{1,5} Intriguingly, IL-1 β apparently induces IL-33 production, perhaps suggesting that IL-33 is part of an autoregulatory mechanism that limits inflammation. In any event, it appears quite probable that IL-33 production plays a key role in Th2-mediated disease states, and future studies may impact therapeutic modalities used for asthma and hypersensitivity.

R&D Systems now offers recombinant IL-33 in both human (Catalog # 3625-IL) and mouse (Catalog # 3626-ML) forms. The activity of both proteins is measured by their ability to induce proliferation of the T lymphocyte (Th2) cell line D10.G4.1, when co-stimulated with sub-optimal amounts of anti-CD3 (Catalog # MAB404; Clone 145-2C11) and recombinant mouse B7-1/Fc chimera (Catalog # 740-B1). Recombinant human and mouse IL-33 also induce IL-13 secretion by D10.G4.1 cells under similar conditions.

References

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- Kropf, P. *et al.* (2003) *Inf. Immun.* **71**:1961.
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Recombinant & Natural Proteins

Protein	Species	Source	Catalog #	Size
2B4/SLAMF4/Fc Chimera	Mouse	NS0	3514-2B-050	50 μ g
Apo-Transferrin	Human	Human Plasma	3188-AT-001G	1 g
Apo-Transferrin	Human	Human Plasma	3188-AT-100MG	100 mg
APP/Protease Nexin II	Human	NS0	3466-PI-010	10 μ g
CD48/SLAMF2	Mouse	NS0	3327-CD-050	50 μ g
EDA (Ectodysplasin)	Mouse	NS0	191-ED-010	10 μ g
IL-33	Human	<i>E. coli</i>	3625-IL-010	10 μ g
IL-33	Mouse	<i>E. coli</i>	3626-ML-010	10 μ g
Lipocalin-2/NGAL	Rat	NS0	3508-LC-050	50 μ g
MMP-12	Mouse	NS0	3467-MP-010	10 μ g
Nogo-A (aa 566-748)/Fc Chimera	Human	CHO	3515-NG-050	50 μ g
OSF-2/Periostin	Human	NS0	3548-F2-050	50 μ g
Semaphorin 6B/Fc Chimera	Human	NS0	2094-S6-050	50 μ g
Trypsin 2/PRSS2	Human	NS0	3586-SE-010	10 μ g
Wnt-5b	Mouse	CHO	3006-WN-025	25 μ g
Wnt-7a	Human	CHO	3008-WN-025	25 μ g
VEGF R1/Flt-1 (aa 27-328)/Fc Chimera	Human	NS0	3516-FL-050	50 μ g

Polyclonal Antibodies

Antibody	Species	Type	Catalog #	Size
ADAMT5	Human	Goat IgG	AF2198	100 μ g
Aminoacylase/ACY1	Human	Goat IgG	AF2900	100 μ g
Aminopeptidase A/ENPEP	Mouse	Goat IgG	AF2809	100 μ g
Aminopeptidase P1/XPNPEP1	Human	Sheep IgG	AF2970	100 μ g
Aminopeptidase PILS/ARTS1	Human	Goat IgG	AF2334	100 μ g
Angiotensin-like 4	Human	Goat IgG	AF3485	100 μ g
Apolipoprotein B (aa 1206-1413)	Human	Goat IgG	AF3556	100 μ g
Artemin	Human	Goat IgG	AF2589	100 μ g
ASK1	Human	Sheep IgG	AF3575	100 μ g
Axin-1	Human/Mouse/Rat	Goat IgG	AF3287	100 μ g
C1qTNF4	Human	Goat IgG	AF3456	100 μ g
Carbonic Anhydrase XII	Human	Goat IgG	AF2190	100 μ g
Carboxypeptidase B1/CPB1	Mouse	Goat IgG	AF2898	100 μ g
Cathepsin C/DPPI	Human	Goat IgG	AF1071	100 μ g
Choline Acetyltransferase/CHAT	Human	Goat IgG	AF3447	100 μ g
CL-P1/COLEC12 (Collectin Placenta 1)	Mouse	Goat IgG	AF3130	100 μ g
Creatine Kinase, Muscle (CK-MM)	Human	Goat IgG	G-113-C	100 μ g
CRELD1	Human	Goat IgG	AF3128	100 μ g
DISP1	Human	Sheep IgG	AF3549	100 μ g
EphA2	Human	Goat IgG	AF3035	100 μ g
EphA5	Mouse	Goat IgG	AF3037	100 μ g
EphB4	Human	Goat IgG	AF3038	100 μ g
FAM3C	Mouse	Goat IgG	AF2868	100 μ g
Fas/TNFRSF6	Feline	Goat IgG	AF2267	100 μ g
FITC		Goat IgG	G-148-C	100 μ g
FKBP38	Human/Mouse/Rat	Goat IgG	AF3580	100 μ g
Flt-3 Ligand	Feline	Goat IgG	AF2467	100 μ g
sFRP-2	Mouse	Goat IgG	AF1169	100 μ g

Polyclonal Antibodies

Antibody	Species	Type	Catalog #	Size
FXR/NR1H4 (Farnesoid X-activated Receptor)	Human	Goat IgG	AF3554	100 µg
Fyn	Human	Goat IgG	AF3574	100 µg
Galectin-9	Mouse	Goat IgG	AF3535	100 µg
GalNAc4S-6ST	Human	Goat IgG	AF3365	100 µg
GDF-9 Propeptide	Mouse	Goat IgG	AF3536	100 µg
GLI-2	Human	Sheep IgG	AF3526	100 µg
Glutaredoxin 1	Human/Mouse	Goat IgG	AF3399	100 µg
Glycogen Phosphorylase Peptide G		Goat IgG	G-149-C	100 µg
GRP75/HSPA9B	Human/Mouse/Rat	Goat IgG	AF3584	100 µg
αHCG (Human Chorionic Gonadotropin α)	Human	Rabbit IgG	R-114-C	100 µg
Hemoglobin	Human	Goat IgG	G-134-C	100 µg
IFN-γ	Bovine	Goat IgG	AF2300	100 µg
IgE	Human	Goat IgG	G-107-C	100 µg
IgM	Human	Goat IgG	G-105-C	100 µg
IL-1ra/IL-1F3	Equine	Goat IgG	AF2466	100 µg
IL-5	Canine	Goat IgG	AF1964	100 µg
IL-5	Porcine	Goat IgG	AF3137	100 µg
IL-6	Feline	Goat IgG	AF2305	100 µg
IL-17 RD/SEF	Mouse	Goat IgG	AF2276	100 µg
IL-18/IL-1F4	Primate	Goat IgG	AF2548	100 µg
Insulin R/CD220	Human	Goat IgG	AF1544	100 µg
Kallikrein 9	Human	Goat IgG	AF3486	100 µg
KLF6 (Krupple-like Factor 6)	Human	Sheep IgG	AF3499	100 µg
LRIG3 (Leucine-rich Repeats and Ig-like Domains)	Human	Goat IgG	AF3495	100 µg
M-Ras/R-Ras3	Human/Rat	Goat IgG	AF3606	100 µg
MCAM/CD146	Rat	Goat IgG	AF3250	100 µg
MCP-1/Prss34	Mouse	Goat IgG	AF2857	100 µg
MEPE	Human	Goat IgG	AF3140	100 µg
Meprin α Subunit	Human	Goat IgG	AF3220	100 µg
Meprin β Subunit	Mouse	Goat IgG	AF3300	100 µg
Mesothelin Propeptide	Human	Goat IgG	AF3448	100 µg
Meteorin	Mouse	Goat IgG	AF3475	100 µg
MFRP (Membrane type Frizzled-related Protein)	Mouse	Goat IgG	AF3445	100 µg
MIS/AMH Propeptide	Human	Goat IgG	AF2748	100 µg
Cardiac Myoglobin	Human	Goat IgG	G-125-C	100 µg
Nectin-3	Mouse	Goat IgG	AF3498	100 µg
Nidogen-2	Human	Goat IgG	AF3385	100 µg
OCIL/CLEC2d	Human	Goat IgG	AF3480	100 µg
OCIL/CLEC2d	Mouse	Goat IgG	AF3376	100 µg
Opticin	Mouse	Goat IgG	AF3547	100 µg
Peroxisredoxin 1	Human/Mouse/Rat	Goat IgG	AF3488	100 µg
Peroxisredoxin 2	Human/Mouse/Rat	Goat IgG	AF3489	100 µg
Peroxisredoxin 6	Human/Mouse/Rat	Goat IgG	AF3490	100 µg
Prohibitin	Human	Goat IgG	AF3470	100 µg
Pygopus-1	Mouse	Goat IgG	AF3533	100 µg
R-Spondin 1	Mouse	Goat IgG	AF3474	100 µg

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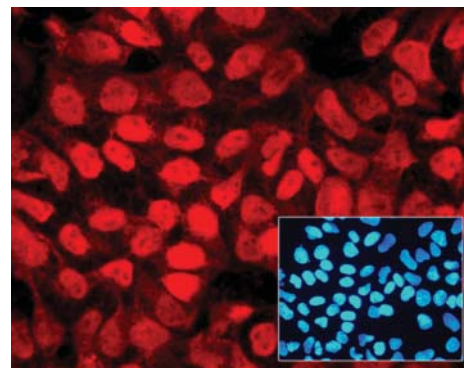
Stem cell and early lineage markers

Many molecular markers have been used to characterize various stem and progenitor cell populations at early differentiation stages. Although functions have yet to be ascertained for many of these markers, their unique expression pattern and timing provide useful tools for scientists to initially identify as well as isolate various stem/progenitor cells. To assist stem cell-related research, R&D Systems has developed several new antibodies to stem cell markers. For our complete line of stem cell research reagents, please see our website at www.RnDSystems.com/go/StemCells

New

anti-Human Antibodies for Stem Cell Research

Antigen	Catalog #
CDCP1	MAB26662
CDX4	MAB2807
MIXL1	MAB2610
NG2	MAB25851
Neurogenin 1	MAB3524
Neurogenin 3	MAB3444
Rex-1	AF3598
SOX1	AF3369
SOX3-APC	IC2569A
SSEA-1-APC	FAB2155A



Detection of SOX1 in human NTERA-2 cells, a neuronal precursor cell line, using R&D Systems goat anti-human SOX1 affinity-purified polyclonal antibody (Catalog # AF3369). Cells were stained using rhodamine red-conjugated donkey anti-goat secondary antibody and counterstained with DAPI (inset).

The TROY/Nogo R/LINGO-1 Inhibitory Receptor Complex

In contrast to almost all adult mammalian tissues, the central nervous system (CNS) has a clearly reduced capacity for regeneration following trauma. The reasons are not clear, as the peripheral nervous system will allow for a robust regrowth of nerve fibers following damage.^{1,2} It has previously been shown that components of CNS myelin can have inhibitory effects on axon outgrowth.^{3,4} Three myelin-associated inhibitory factors (MAIFs) are of particular interest: MAG (myelin-associated glycoprotein), OMgp (oligodendrocyte-myelin glycoprotein) and Nogo-A. These molecules are all known to bind to a receptor complex that includes NGF R/p75^{NTR}, Nogo Receptor (NgR), and LINGO-1. Any two of the three co-receptors can dimerize in the absence of the third partner.⁵ NgR is a GPI-linked molecule and has no signaling capability, while LINGO-1 and NGF R/p75^{NTR} are transmembrane proteins that may cooperate in signal transduction. Ligation of the complex by any of the three MAIFs results in RhoA activation and growth cone collapse.^{4,6}

In the adult CNS, NGF R/p75^{NTR} exhibits restricted expression, principally by IB4⁺ dorsal root ganglion (DRG) cells. This limited expression pattern fails to explain CNS-wide antagonism to axon regrowth. Because NGF R/p75^{NTR} is a member of the TNFRSF superfamily, it was suggested that perhaps another family member might substitute and also form an inhibitory receptor complex. Subsequent studies have shown that TROY is such a molecule.^{7,8} Notably, it forms a bond with NgR that has an 8-fold higher affinity than NGF R/p75^{NTR}, it mediates growth cone collapse, and signals through RhoA.^{1,8} Although this would seem to explain MAIF activity, it appears that other pathways and/or NGF R/p75^{NTR} substitutes exist because knockout of TROY does not result in complete reversal of MAIF action.^{1,7,8}

References

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Polyclonal Antibodies

Antibody	Species	Type	Catalog #	Size
<i>Continued from page 3.</i>				
Rex-1	Human	Sheep IgG	AF3598	100 µg
SCF	Feline	Goat IgG	AF2268	100 µg
SCF	Canine	Goat IgG	AF2278	100 µg
SorCS1	Human	Goat IgG	AF3457	100 µg
SOX1	Human	Goat IgG	AF3369	100 µg
Src	Human/Mouse/Rat	Goat IgG	AF3389	100 µg
VE-Statin	Mouse	Goat IgG	AF3089	100 µg
Superoxide Dismutase-1/Cu-Zn SOD	Human/Mouse/Rat	Goat IgG	AF3418	50 µg
Tau		Goat IgG	AF3494	100 µg
TC21/R-Ras2	Human/Rat	Goat IgG	AF3605	100 µg
TFPI	Human	Goat IgG	AF2974	100 µg
Thioredoxin-like 5/TRP14	Human	Goat IgG	AF3504	100 µg
TRH-degrading Ectoenzyme/TRHDE	Mouse	Goat IgG	AF2985	100 µg
TRIM5 (Tripartite Motif-containing Protein)	Mouse	Goat IgG	AF3550	100 µg
Troponin I Peptide 3	Human	Goat IgG	G-129-C	100 µg
UGRP1	Mouse	Goat IgG	AF3465	100 µg
Uteroglobin-related Protein (UGRP1)	Human	Goat IgG	AF3545	100 µg
Wnt-7b	Human	Goat IgG	AF3460	100 µg

Monoclonal Antibodies

Antibody	Species	Clone	Catalog #	Size
AMIGO2	Human	273610	MAB20801	100 µg
Arylsulfatase A/ARSA	Human	324802	MAB2485	100 µg
BMP-15/GDF-9B	Human	317809	MAB2925	100 µg
BOC (Brother of CDO)	Human/Mouse	273729	MAB20361	100 µg
C1qTNF5	Human	332923	MAB3167	100 µg
Cadherin-8	Human	147210	MAB188	100 µg
Cadherin-12	Human	343621	MAB2240	100 µg
CCR7	Mouse	4812	MAB3477	100 µg
CCR10	Human	314305	MAB3478	100 µg
CD2	Human	299812	MAB18561	100 µg
CD2F-10/SLAMF9	Mouse	330003	MAB2829	100 µg
CD4	Canine	296712	MAB2410	100 µg
CD27/TNFRSF7	Mouse	137910	MAB574	100 µg
CD45	Mouse	319211	MAB3507	100 µg
CD69	Mouse	310106	MAB2386	100 µg
CD74	Human	332512	MAB3590	100 µg
CD200	Human	325520	MAB2724	100 µg
CD200	Human	325516	MAB27241	100 µg
CDSCP1	Human	309121	MAB26662	100 µg
CDX4	Human	322007	MAB2807	100 µg
Chitinase 3-like 1	Human	321806	MAB2599	100 µg
CHL-1/L1CAM-2	Human	316223	MAB2126	100 µg
Choline Acetyltransferase/CHAT	Human	334008	MAB3447	100 µg
Coagulation Factor XI	Human	318104	MAB24601	500 µg
COCO	Human	322206	MAB3047	100 µg

Continued on page 5.

Monoclonal Antibodies

Antibody	Species	Clone	Catalog #	Size
<i>Continued from page 4.</i>				
COCO	Mouse	340531	MAB3356	100 µg
Common β Chain	Human	140516	MAB906	100 µg
Common γ Chain/IL-2 R γ	Mouse	135727	MAB7841	500 µg
CRISP-3	Human	295203	MAB23971	100 µg
CXCL1/2/3/GRO (Pan)	Human	29702	MAB2761	100 µg
CXCL16	Human	256213	MAB976	100 µg
Cytokeratin 19	Human	BA17	MAB3506	100 µg
DCIR/CLEC4A	Mouse	320507	MAB26171	100 µg
DPCR-1	Human	213201	MAB3347	100 µg
DSPG3 (Dermatan Sulfate Proteoglycan)	Mouse	340908	MAB2875	100 µg
EPCR (Endothelial Protein C Receptor)	Human	304519	MAB22451	100 µg
Exostoin-like 3	Human	311007	MAB2635	100 µg
FABP1	Human	328607	MAB2964	100 µg
FABP2	Human	323701	MAB3078	100 µg
FABP5	Human	311215	MAB3077	100 µg
FABP9	Mouse	324926	MAB2750	100 µg
FcRH5/IRTA2	Human	307314	MAB2087	100 µg
FGF-21	Human/Mouse	315901	MAB25371	100 µg
FPRL1	Human	304405	MAB3479	100 µg
Frizzled-9	Mouse	291004	MAB2440	100 µg
sFRP-2	Mouse	331022	MAB1169	100 µg
Gas1	Human	309325	MAB2636	100 µg
GPR39	Human	189702	MAB3348	100 µg
IFN- γ	Porcine	154007	MAB985	100 µg
β IG-H3	Mouse	320305	MAB2559	100 µg
IGSF4/SynCAM	Mouse	318701	MAB1459	100 µg
IKK ϵ	Human/Mouse/Rat	346909	MAB3199	100 µg
IL-1 R9	Mouse	320017	MAB3068	100 µg
IL-5	Rat	299298	MAB5452	100 µg
IL-6	Feline	341041	MAB2305	500 µg
IL-12 R β 2	Human	305719	MAB1959	100 µg
IL-12/IL-23 p40	Rat	319429	MAB3510	500 µg
IL-17D	Mouse	312724	MAB2274	100 µg
IL-18/IL-1F4	Canine	314820	MAB2924	100 µg
IL-18/IL-1F4	Canine	314811	MAB29241	100 µg
IL-21 R	Mouse	155516	MAB5961	100 µg
IL-28/IFN- λ	Human	248512	MAB15871	500 µg
IL-31	Human	308227	MAB2824	100 µg
IL-31	Mouse	323407	MAB3028	100 µg
ILT6/CD85e	Human	293106	MAB2574	100 µg
Integrin α 7	Mouse	334908	MAB3518	100 µg
Integrin α L/CD11a	Human	345913	MAB3595	100 µg
Integrin β 7	Mouse	332428	MAB30602	100 µg
Kallikrein 1	Human	323803	MAB2337	100 µg
Kallikrein 4	Human	325712	MAB35661	500 µg
Kallikrein 5	Human	325302	MAB11082	100 µg

Continued on page 6.

EDA

Ectodysplasin (EDA) is a type II transmembrane TNF superfamily protein that is involved in the development of selected tissues. EDA exists in many splice forms, dominated by EDA-A1 and EDA-A2, which differ by the presence or absence of two amino acids.¹ This change determines the receptor selectivity of the isoforms: EDA-A1 binds EDAR, and EDA-A2 binds XEDAR.² The extracellular domain of EDA-A1 contains a terminal TNF homology domain, a collagenous domain, and a stalk region.³ Within the collagenous and TNF homology domains, EDA-A1 is greater than 97% conserved between bovine, canine, human, mouse, and rat. EDA-A1 associates into noncovalent homotrimers by means of its collagenous domain.³ A furin-like protease can release the collagenous and TNF homology domains as a fragment that maintains its trimeric state and ability to bind EDAR.⁴

EDA-A1 controls ectodermal appendage formation and differentiation by regulating the function of epithelial signaling centers.⁵ It is critical to the patterning and development of hair follicles and teeth.⁵ EDA-A1 is also expressed in embryonic epidermis, sweat glands, salivary glands, and forebrain. Complementary receptor and ligand expression patterns are regulated by factors involved in many aspects of tissue morphogenesis.⁵ EDA-A1 expression is induced by Wnt-6, while the expression of EDAR is induced by activin A and inhibited by BMP-2, -4, and -7.^{5,6} EDA-A1 interactions with EDAR activate NF κ B and lead to the induction of lymphotoxin β .⁷

Several mutations in EDA-A1 and EDAR have been associated with X-linked hypohidrotic ectodermal dysplasia (HED), a human disorder of hair, tooth, and sweat gland development.⁸ In mice, a comparable phenotype results from mutation of the *tabby* or *downless* genes, which encode EDA-A1 and EDAR, respectively. Some EDA-A1 polymorphisms found in HED patients alter the protease recognition site and prevent shedding.⁴

References

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Monoclonal Antibodies

Antibody	Species	Clone	Catalog #	Size
<i>Continued from page 5.</i>				
KGF/FGF-7	Canine	299026	MAB1957	100 µg
Legumain	Human	312114	MAB2199	100 µg
LINGO-1	Human	332233	MAB3086	100 µg
LMIR5/CD300LB	Mouse	339003	MAB2580	100 µg
Mimecan	Mouse	329939	MAB2949	100 µg
Mindin	Human	331620	MAB2609	100 µg
MIXL1	Human	319919	MAB2610	100 µg
MyD88	Human	316603	MAB2928	100 µg
Myocilin	Human	297817	MAB3446	100 µg
NCAM-1/CD56	Human	301040	MAB2408	100 µg
Neurogenin-1	Human	309707	MAB3524	100 µg
Neurogenin-3	Human	258602	MAB3444	100 µg
NF-H	Human	321721	MAB3108	100 µg
NF-M	Human	327921	MAB3029	100 µg
NG2/MCSP	Human	7.1	MAB25851	100 µg
NgR2/NgRH1	Human	333413	MAB2776	100 µg
OBCAM	Human	341706	MAB2777	100 µg
Osteocrin	Human/Mouse	311417	MAB2620	100 µg
Osteocrin	Human/Mouse	311413	MAB26201	100 µg
PD-L2	Mouse	168633	MAB1022	100 µg
Persephin	Human	275508	MAB2388	100 µg
Relaxin-3	Human	332112	MAB3107	100 µg
RIP1	Human/Mouse/Rat	334640	MAB3585	100 µg
ROBO3	Human	327111	MAB3076	100 µg
Siglec-2/CD22	Mouse	308501	MAB2296	100 µg
SIRP β1 (Signal Regulating Protein)	Human	308906	MAB2096	100 µg
Sleeping Beauty Transposase	Multi-species	324622	MAB2798	100 µg
SLITRK4	Human	319514	MAB2860	100 µg
SLITRK5	Human	310516	MAB2587	100 µg
SorCS3	Human/Mouse	339624	MAB3067	100 µg
SR-AI/MSR (Scavenger Receptor)	Mouse	268318	MAB1797	100 µg
Sulfatase Modifying Factor 1/SUMF1	Human/Mouse	329005	MAB2779	100 µg
Sulfatase Modifying Factor 2/SUMF2	Human	330312	MAB3594	100 µg
Testican 1/SPOCK1	Human	316801	MAB2327	100 µg
TGF-β RI/ALK-5	Human/Mouse	141231	MAB5871	100 µg
TIM-5	Mouse	339319	MAB3374	100 µg
TLR3	Mouse	313129	MAB3005	100 µg
TLR4	Mouse	267518	MAB2759	100 µg
TM4SF18	Human	211116	MAB3509	100 µg
TrkA	Rat	315104	MAB1056	100 µg
TROY/TNFRSF19	Mouse	323606	MAB723	100 µg
TWEAK R/TNFRSF12	Human	314502	MAB1199	100 µg
TWEAK R/TNFRSF12	Mouse	314636	MAB16101	100 µg
Tyk2	Human	307214	MAB3427	100 µg
WASP (Wiscott-Aldrich Syndrome Protein)	Human	336925	MAB3070	100 µg

Semaphorin 6B

Semaphorin 6B (Sema6B) is a 120 kDa member of the Semaphorin family of axon guidance molecules, best known for their ability to initiate growth cone collapse and axon repulsion (Figure 1).¹⁻⁴ Full-length Sema6B is thought to form disulfide-linked homodimers.⁴ Alternate exon splicing creates a putative secreted form (Sema6B.1) and a form with a shortened cytoplasmic tail (Sema6B.2).³

Sema6B is highly expressed in human brain, and some glioblastoma and breast cancer cell lines. All-trans retinoic acid slows cancer cell growth and down-regulates Sema6B expression, probably via dimerization with peroxisome proliferator-activated receptors (PPAR) that have a response element on the Sema6B gene.^{3,5,6} Semaphorins transduce signals through transmembrane plexins, either directly or by binding associated neuropilin receptors. Plexin-A4 binds Sema6A (high affinity) and 6B (low affinity), and mediates sympathetic ganglion axon-repulsion independent of neuropilin-1.⁷

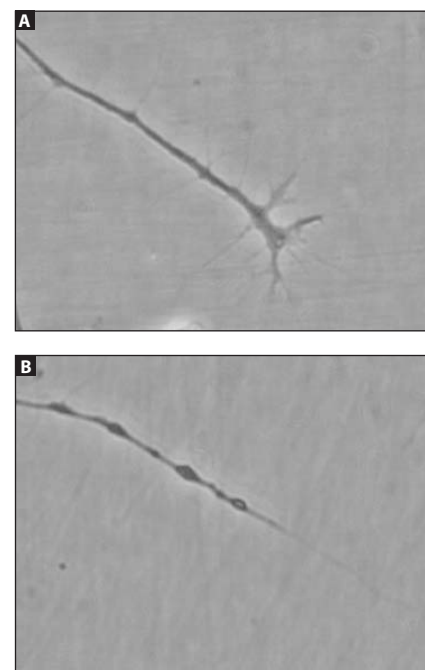


Figure 1. A: A fully extended DRG growth cone growing on a laminin-coated tissue culture plate in the presence of R&D Systems human β-NGF (Catalog # 256-GF). **B:** A collapsed DRG growth cone, following treatment with R&D Systems human Semaphorin-6B/Fc (Catalog # 2094-S6). The ED₅₀ for this effect is typically 5 µg/mL.

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Wnt-7a & Wnt-5b

Members of the Wnt family of signaling molecules are secreted glycoproteins that regulate a wide range of processes in the embryo and adult.¹

Wnt-7a knockout mice exhibit aberrant dorsal limb structures as well as missing posterior digits, and Wnt-7a mutations have been implicated in human limb malformations.^{2,3} Roles for Wnt-7a have also been demonstrated in development of the reproductive tract and it may act as a potential mediator of synaptic plasticity in the brain.^{4,5}

Wnt-5b is expressed in adult prostate, liver, adipose tissue and pancreas, as well as during development in brain, lung, kidney, ovary and small intestine.^{6,7} Wnt-5b, together with Wnt-5a, acts to regulate growth of endochondral bones by influencing chondrocyte differentiation and proliferation patterns.⁸ In addition, a recent study of Japanese populations identified Wnt-5b as a candidate gene for conferring susceptibility to type II diabetes.⁷

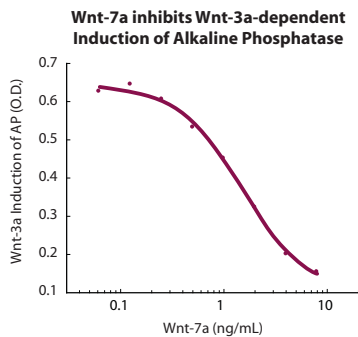


Figure 1. R&D Systems Wnt-7a (Catalog # 3008-WN) inhibits Wnt-3a (Catalog # 1324-WN; 10 µg/mL)-induced synthesis of alkaline phosphatase by MC3T3-E1 osteoblastic cells

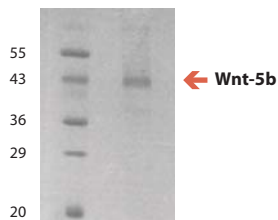


Figure 2. R&D Systems recombinant mouse Wnt-5b (Catalog # 3006-WN) at 1 µg/mL is visualized on a Coomassie blue-stained 12% SDS polyacrylamide gel under reducing conditions.

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Labeled Antibodies

Biotinylated Antibodies

Antibody	Species	Type	Catalog #	Size
A33	Human	Goat IgG	BAF3080	50 µg
Adiponectin/Acrp30	Rat	Goat IgG	BAF3100	50 µg
Aminopeptidase P2/XPNPEP2*	Human	Goat IgG	BAF2490	50 µg
Apolipoprotein B100	Human	Goat IgG	BAF3260	50 µg
CD48/SLAMF2	Mouse	Goat IgG	BAF3327	50 µg
CD200	Mouse	Goat IgG	BAF3355	50 µg
COCO	Mouse	Goat IgG	BAF3356	50 µg
CRHBP (Corticotropin Releasing Hormone Binding Protein)	Mouse	Goat IgG	BAF3087	50 µg
CXADR	Human	Goat IgG	BAF3336	50 µg
CXCL14/BRAK	Human	Mouse IgG _{2b}	BAM8661	50 µg
FAM3C	Human	Goat IgG	BAF3084	50 µg
Fas/TNFRSF6	Feline	Goat IgG	BAF2267	50 µg
FGF-21	Mouse	Goat IgG	BAF3057	50 µg
FoxP3	Human	Goat IgG	BAF3240	50 µg
Galectin-3	Human	Goat IgG	BAF1154	50 µg
Galectin-7	Mouse	Goat IgG	BAF1304	50 µg
HAND1	Human	Goat IgG	BAF3168	50 µg
IFN-α/βR1	Mouse	Goat IgG	BAF3039	50 µg
IFN-γ	Bovine	Goat IgG	BAF2300	50 µg
IGSF4A/SynCAM	Mouse	Goat IgG	BAF1459	50 µg
IGSF8	Mouse	Goat IgG	BAF3117	50 µg
IL-13	Rat	Mouse IgG _{2b}	BAM1945	100 µg
IL-17 RC	Human	Goat IgG	BAF2269	50 µg
IL-17 RD	Mouse	Goat IgG	BAF2276	50 µg
IL-24	Mouse	Rat IgG _{2A}	BAM2786	100 µg
IL-27	Human	Goat IgG	BAF2526	50 µg
IL-32α	Human	Goat IgG	BAF3040	50 µg
Kallikrein 7	Human	Goat IgG	BAF2624	50 µg
Kirrel2	Human	Sheep IgG	BAF2564	50 µg
LMIR2/CD300c	Human	Goat IgG	BAF3256	50 µg
LSECTin/CLEC4G	Human	Goat IgG	BAF2947	50 µg
Matrilin-3	Mouse	Goat IgG	BAF3357	50 µg
Matrilin-4	Mouse	Goat IgG	BAF3380	50 µg
MCP-11 (Mast Cell Protease)	Mouse	Goat IgG	BAF2857	50 µg
Meprin β	Human	Goat IgG	BAF2895	50 µg
Mesothelin	Human	Goat IgG	BAF3265	50 µg
MFG-E8 (Milk Fat Globule-EGF Factor)	Mouse	Goat IgG	BAF2805	50 µg
MICL/CLEC12A	Human	Goat IgG	BAF2946	50 µg
MOG (Myelin Oligodendrocyte Glycoprotein)	Human/Mouse	Rat IgG _{2b}	BAM2439	100 µg
Musashi-2	Human	Goat IgG	BAF3255	50 µg
OSF-2/Periostin	Mouse	Goat IgG	BAF2955	50 µg
Osteoadherin	Mouse	Goat IgG	BAF3308	50 µg
plgR (Polymeric Ig Receptor)	Human	Goat IgG	BAF2717	50 µg
plgR (Polymeric Ig Receptor)	Mouse	Goat IgG	BAF2800	50 µg
Podoplanin	Mouse	Goat IgG	BAF3244	50 µg
Rex-1	Human	Sheep IgG	BAF3598	50 µg
ROBO2	Human	Goat IgG	BAF3147	50 µg

*U.S. Patent #6,399,349 used under license from Ryogen LLC

Protease Nexin II: Soluble APP as a Serine Protease Inhibitor

Amyloid β peptide ($A\beta$), the major component of the plaques found in the brains of Alzheimer's disease (AD) patients, is generated from amyloid precursor protein (APP) after cleavage by β - and γ - secretases (Figure 1). Reducing the levels of $A\beta$ is one of the strategies towards AD treatment, either by precluding $A\beta$ formation through selective inhibition of β - and γ - secretases and enhancement of α -secretase or by removing $A\beta$ via up-regulating degrading enzymes.

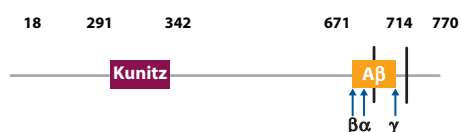


Figure 1. The structure of amyloid precursor protein. Highlighted are the Kunitz domain, the Alzheimer's-associated $A\beta$ segment, and the cleavage points for α -, β -, and γ -secretases. The vertical bars represent the transmembrane region, and numbers representing amino acids are shown above.

The action of α - or β - secretase also releases APP from its membrane association. Several APP isoforms exist due to alternative splicing, and the amino acid numbering corresponds to APP770, the longest isoform. APP770, APP751 and APP733, but not APP695, contain a Kunitz domain. Soluble APP isoforms containing the Kunitz domain act as potent inhibitors of serine proteases, and have been referred to as protease nexin II (Figure 2).¹

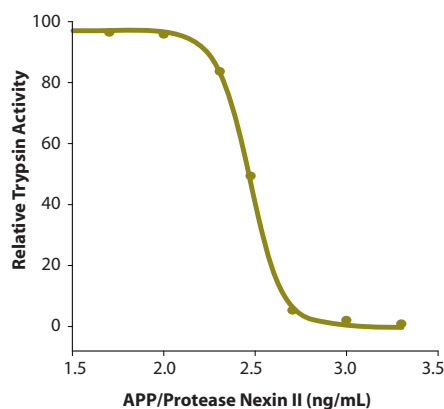


Figure 2. R&D Systems recombinant human APP/Protease Nexin II (Catalog # 3466-PI) consists of amino acid residues 18 to 688 from APP770 and inhibits trypsin activity in a dose-dependent manner.

References

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Labeled Antibodies

Biotinylated Antibodies

Antibody	Species	Type	Catalog #	Size
SCF	Feline	Goat IgG	BAF2268	50 μ g
Siglec-11	Human	Goat IgG	BAF3258	50 μ g
SR-AI/MSR	Human	Goat IgG	BAF2708	50 μ g
SREC-II	Human	Goat IgG	BAF2527	50 μ g
Syndecan-4	Human	Goat IgG	BAF2918	50 μ g
TIM-5	Mouse	Goat IgG	BAF3374	50 μ g
Wnt-9a	Human	Goat IgG	BAF3157	50 μ g
wnvNS3 (West Nile Virus N53 Protease)	Viral	Goat IgG	BAF2907	50 μ g

Labeled Antibodies

Fluorochrome-labeled Antibodies

Antibody	Species	Label	Catalog #	Size
E-Cadherin	Mouse	APC	FAB7481A	100 Tests
E-Cadherin	Mouse	Fluorescein	FAB7481F	100 Tests
E-Cadherin	Mouse	PE	FAB7481P	100 Tests
P-Cadherin	Human	APC	FAB861A	100 Tests
P-Cadherin	Human	PE	FAB861P	100 Tests
P-Cadherin	Mouse	APC	FAB761A	100 Tests
P-Cadherin	Mouse	PE	FAB761P	100 Tests
CCL18/PARC	Human	APC	IC394A	100 Tests
CCL18/PARC	Human	Fluorescein	IC394F	100 Tests
CCL20/MIP-3 α	Human	Fluorescein	IC360F	100 Tests
CCL20/MIP-3 α	Human	PE	IC360P	100 Tests
CCR10	Human	APC	FAB3478A	100 Tests
CCR10	Human	PE	FAB3478P	100 Tests
CD34	Canine	APC	FAB3346A	100 Tests
CD34	Canine	Fluorescein	FAB3346F	100 Tests
CD34	Canine	PE	FAB3346P	100 Tests
CD40 Ligand/TNFSF5	Human	APC	FAB617A	100 Tests
CD40 Ligand/TNFSF5	Human	Fluorescein	FAB617F	100 Tests
CD40 Ligand/TNFSF5	Human	PE	FAB617P	100 Tests
CD43	Human	APC	FAB2038A	100 Tests
CD43	Human	PE	FAB2038P	100 Tests
CEACAM-1/CD66a	Human	APC	FAB2244A	100 Tests
CEACAM-1/CD66a	Human	PE	FAB2244P	100 Tests
CXCR6	Mouse	APC	FAB2145A	100 Tests
CXCR6	Mouse	PE	FAB2145P	100 Tests
DEP-1/CD148	Human	Fluorescein	FAB1934F	100 Tests
DEP-1/CD148	Human	PE	FAB1934P	100 Tests
EpCAM/TROP-1	Human	APC	FAB9601A	100 Tests
EpCAM/TROP-1	Human	Fluorescein	FAB9601F	100 Tests
G-CSF R/CD114	Human	APC	FAB381A	100 Tests
G-CSF R/CD114	Human	Fluorescein	FAB381F	100 Tests
G-CSF R/CD114	Human	PE	FAB381P	100 Tests
HM74A	Human	APC	FAB2760A	100 Tests
HM74A	Human	Fluorescein	FAB2760F	100 Tests
HM74A	Human	PE	FAB2760P	100 Tests

Continued on page 9.

Labeled Antibodies

Fluorochrome-labeled Antibodies

Antibody	Species	Label	Catalog #	Size
<i>Continued from page 8.</i>				
IFN- α / β R1	Human	Fluorescein	FAB245F	100 Tests
IFN- α / β R1	Human	PE	FAB245P	100 Tests
IFN- α / β R2	Mouse	APC	IC1083A	100 Tests
IFN- α / β R2	Mouse	Fluorescein	IC1083F	100 Tests
IFN- α / β R2	Mouse	PE	IC1083P	100 Tests
IL-2 R α	Human	APC	FAB1020A	100 Tests
NCAM-1/CD56	Human	APC	FAB2408A	100 Tests
NCAM-1/CD56	Human	PE	FAB2408P	100 Tests
Phospho-p53 (S15)	Human	APC	IC18392A	100 Tests
p53	Human	APC	IC13551A	100 Tests
SOX3	Human	APC	IC2569A	100 Tests
VEGF R2/KDR	Human	Fluorescein	FAB357F	100 Tests

Antibody Controls

Antibody	Species	Catalog #	Size
Normal Sheep IgG	Sheep	5-001-A	1 mg
Normal Rat IgG	Rat	6-001-A	1 mg

Secondary Antibodies

Description	Label	Catalog #	Size
Chicken Anti-goat IgG		C-401-C-ABS	500 μ g
Donkey Anti-goat IgG	PE	F0107	100 Tests
Donkey Anti-goat IgG	APC	F0108	100 Tests
Donkey Anti-goat IgG	Fluorescein	F0109	100 Tests
Donkey Anti-mouse IgG		D-201-C-ABS2	500 μ g
Donkey Anti-Rabbit IgG		D-301-C-ABS2	500 μ g
Donkey Anti-Sheep IgG		D-501-C-ABS	500 μ g
Goat Anti-human IgG Fc		G-102-C	100 μ g
Goat Anti-human IgG Fc		G-202-C	100 μ g
Goat Anti-rabbit IgG	PE	F0110	100 Tests
Goat Anti-rabbit IgG	APC	F0111	100 Tests
Goat Anti-rabbit IgG	Fluorescein	F0112	100 Tests
Goat F(ab) ₂ Anti-rat IgG (H+L)	APC	F0113	100 Tests
Anti-human IgG		G-101-C-ABS	500 μ g
Rabbit Anti-goat IgG		R-401-C-ABS	500 μ g

Cell Culture Products

StemXVivo™ Stem Cell Media and Supplements

Product	Species	Catalog #	Size
StemXVivo Serum-Free Dendritic Cell Base Media	Human	CCM003	250 mL
StemXVivo Mesenchymal Stem Cell Expansion Media	Human/Mouse	CCM004	250 mL
StemXVivo Chondrogenic Base Media	Human/Mouse	CCM005	50 mL
StemXVivo Chondrogenic Supplement, 0.5 mL	Human/Mouse	CCM006	1 Vial
StemXVivo Osteogenic Base Media	Human/Mouse	CCM007	250 mL
StemXVivo Osteogenic Supplement, 12.5 mL	Human	CCM008	1 Vial
StemXVivo Osteogenic Supplement, 12.5 mL	Mouse	CCM009	1 Vial

R-spondin 1

R-spondin 1 (roof plate-specific spondin) was named due to its expression during development of the dorsal neural tube at the boundary between the roof plate and the neuroepithelium.¹ Subsequent studies identified additional family members, R-spondins 2, 3 and 4 in humans and mice, as well as orthologs in *Xenopus*, chicken and zebrafish.

R-spondin was identified in two separate screens for Wnt pathway interacting proteins, where it was shown to stabilize β -catenin and lead to activation of Wnt target genes. A screen for Wnt/ β -catenin modulators using *Xenopus* cDNA and the Wnt-responsive reporter TOPFLASH in HEK293T cells identified *Xenopus* R-spondin 2. Inhibition of R-spondin in *Xenopus* embryos resulted in defective myogenesis, and knockdown of R-spondins in HeLa cells decreased Wnt-3a-induced activation of Wnt-responsive reporter genes.³

The second screen used a transgenic mouse knock-in approach, in which R-spondin 1 was expressed in B cells under control of the immunoglobulin κ promoter. This ectopic expression, as well as direct injection of R-spondin 1 protein, resulted in a significant increase in proliferation in cells of the small intestine and colon. Individual colon crypt cells exhibited stabilization of cytosolic β -catenin and activation of Wnt/ β -catenin target genes.⁴

A third study also identified R-spondins as secreted activators of Wnt responsive TOPFLASH reporters via stabilization of β -catenin.⁵ Although broad agreement exists that R-spondins mediate β -catenin stabilization, the mechanism remains unclear. They may bind to Wnt ligands, Frizzled receptors, LRP co-receptors, or some combination of the three. However, some studies have suggested R-spondins may act through a separate, as yet unidentified receptor.²

References

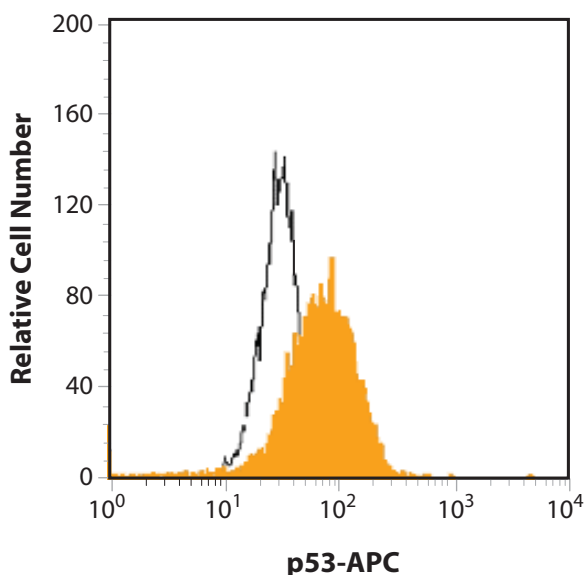
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Fluorochrome-conjugated antibodies to the p53 tumor suppressor

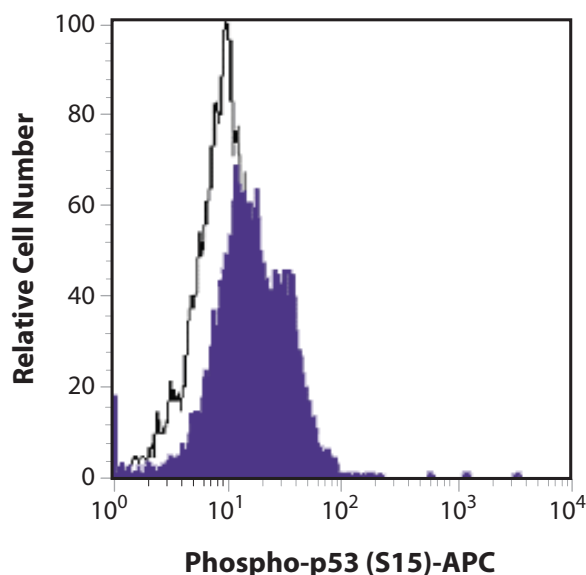
Flow cytometry is a method of choice for identifying and quantifying the binding of fluorochrome-labeled antibodies to specific protein antigens. It has been extensively used in the fields of hematology and immunology to study and identify cell phenotypes through the simultaneous analysis of both surface and intracellular molecules at the single cell level.

The p53 tumor suppressor acts as an important regulator of cell cycle checkpoints and/or inducer of apoptosis in cells that have incurred genotoxic damage. R&D Systems has developed fluorochrome-

conjugated antibodies that recognize either total or phosphorylated p53 (S15). The ATM or ATR kinases can phosphorylate p53 at S15, which leads to cell cycle arrest. S15 phosphorylation leads to p53 stabilization and enhances the transactivation of p53 target genes. These fluorochrome-conjugated antibodies enable researchers to conveniently identify cell characteristics and to quantitatively assess signal transduction.



Intracellular staining of camptothecin-stimulated (filled histogram) or unstimulated MCF-7 cells (open histogram) with R&D Systems allophycocyanin (APC)-conjugated anti-human p53 (Catalog # IC13551A).



Intracellular staining of camptothecin-stimulated MCF-7 cells with R&D Systems APC-conjugated anti-human phospho-p53 (S15) antibody (Catalog # IC18392A; filled histogram) or with R&D Systems isotype control antibody (Catalog # IC003A; open histogram).



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