R&D Systems Cancer Focus
spring | 2007

Cancer FOCUS

Inside

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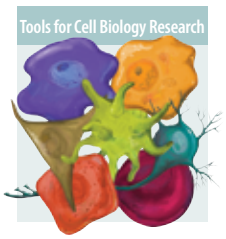

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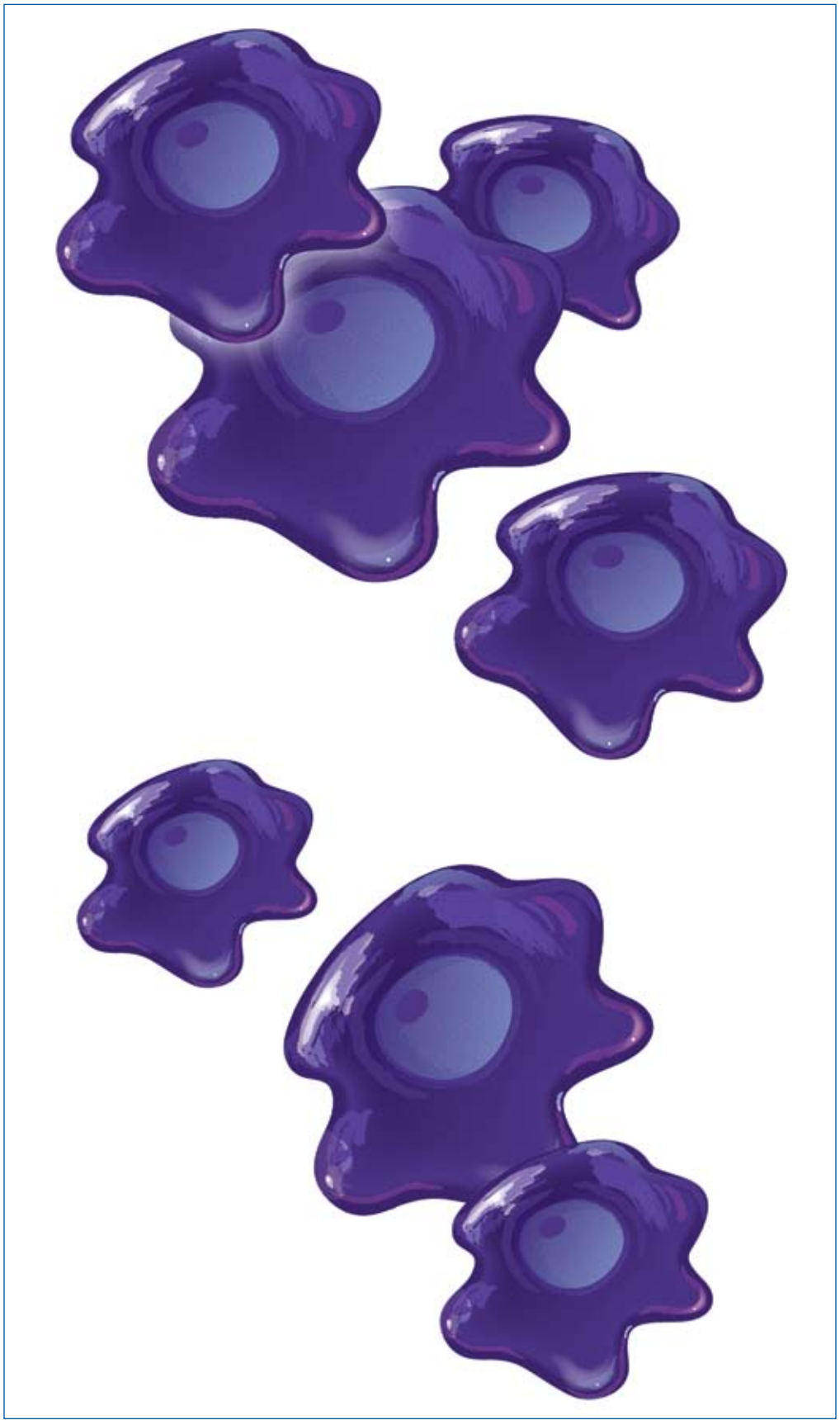


Cancer Stem Cells

Just as mature cells of the blood, skin, colon, and breast are replenished by a population of tissue-specific stem cells, increasing evidence now suggests that cancers, too, depend on stem cells for continued growth. This notion originated in studies of hematopoietic cell types, where the leukemia stem cell (LSC) was identified by flow cytometric studies. Cancer stem cells have subsequently been identified in solid tumors of the breast and nervous system, suggesting that this phenomenon may be widespread. Importantly, molecules that serve as markers (either singly or in particular combinations) of cancer stem cells have also been discovered, allowing identification, purification, and detailed study of these cells.

SOX2 Expression in Teratocarcinoma

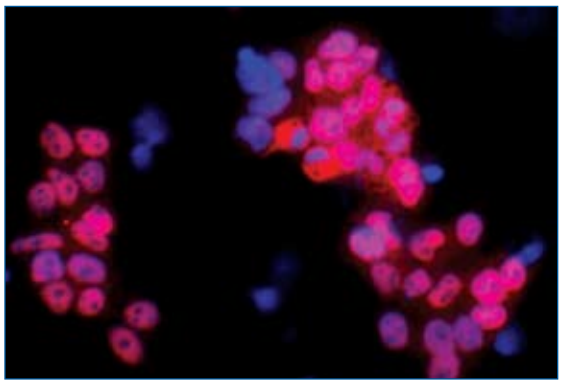


Figure 1. Detection of SOX2 in NTera-2 cells (human teratocarcinoma stem cells) using a mouse anti-human SOX2 monoclonal antibody (Catalog # MAB2018; red). The nucleus was counterstained with DAPI (blue). *Image courtesy of Jingli Cai and Mahendra Rao, National Institutes of Health.*

SCF R/c-kit in TF-1 Cells

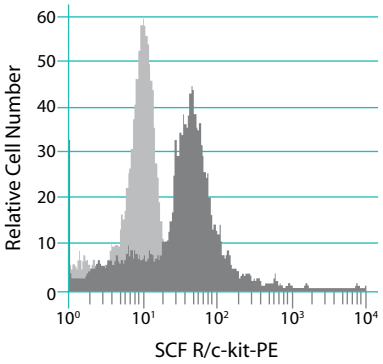


Figure 2. Detection of SCF R/c-kit in TF-1 cells (human erythroleukemic cell line) using flow cytometry. Cells were stained with a phycoerythrin (PE)-conjugated anti-human SCF R/c-kit monoclonal antibody (Catalog # FAB332P; dark gray histogram) or isotype control (Catalog # IC002P, light gray histogram).

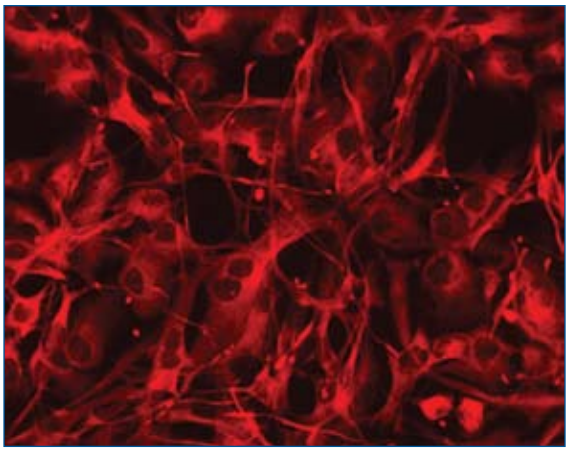
Cancer Stem Cell Markers

MOLECULE	ANTIBODIES	PROTEINS	ELISAs/ASSAYS
Hematopoietic Cancer Stem Cell Markers			
BMI-1	H		
CD34	Ca		
CD38	H		
CD90/Thy1	H		
IL-3 Rα	H M	H M	
Neprilysin/CD10	H M		H
SCF R/c-kit	H M	H	H
Syndecan-1/CD138	H M		
TfR (Transferrin R)	H		
Breast Cancer Stem Cell Markers			
CD2	H M		
CD3	H M		
CD31/PECAM-1	H	H M P	
CD44	H	H	
Fcγ RI/CD64	H M	H M	
Fcγ RIII/CD16	H M	H M	
Integrin β_2/CD18	H M		
Neprilysin/CD10	H M		H
Nervous System Cancer Stem Cell Markers			
BMI-1	H		
Musashi-1	H		
Nestin	H R		
SOX2	H M		

Key: H Human M Mouse R Rat Ca Canine P Porcine

Expression of Nestin in Glioblastoma

Figure 3. Detection of nestin in human glioblastoma cells using mouse anti-human nestin monoclonal antibody (Catalog # MAB1259). Cells were stained with a rhodamine-conjugated secondary antibody (red).



Additional Stem Cell-Related Kits & Panels

- > Differentiation Kits
- > Cell Type-specific Expansion Kits
- > Identification Kits
- > Stem Cell Antibody Panels
- > Lineage Depletion Antibodies & Kits

EMMPRIN: A New Link Between the MMP & uPA Systems in Cancer

EMMPRIN, also known as basigin and CD147, is type I transmembrane protein with multiple functions. It stimulates production of MMP-1, -2, -3, -14, or -15 in different cell types. EMMPRIN expression is increased in a variety of tumors and correlates with tumor progression. Its role in cancer may not be restricted to the cell surface because it is shed from tumor cells by MMP-14. EMMPRIN has recently been shown to up-regulate the urokinase-type plasminogen activator (uPA) system, promoting tumor cell invasion. EMMPRIN emerges as a new link between the MMP and uPA systems, two distinct groups of proteases and inhibitors well known for their intimate interactions and important functions in cancer. R&D Systems provides many reagents for molecules from the two groups including recently released recombinant human EMMPRIN/Fc (Catalog # 972-EMN; Figure 1), fluorogenic peptide substrates (Table 1), human MMP/TIMP complex DuoSet® ELISA Development Kits (Table 2), and a human Serpin E1/PAI-1 Quantikine® ELISA Kit (Catalog # DSE100; Figure 2).

Emmprin, MMP, & uPA-related Products

MOLECULE	PROTEINS	ANTIBODIES	ELISAs/ASSAYs	ELISpot KITS	MULTIPLEX ASSAY
EMMPRIN/CD147	H	H M			
TRA-1-85 (EMMPRIN Epitope)		H			
uPA	H	H			
MMP-2	H M R	H M R	H M R		H
MMP-3	H M	H M	H M	H	H
MMP-7	H M	H M	H	H	H
MMP-8	H M R	H R	H		H
MMP-9	H M	H M	H M	H M	H
MMP-10	H	H	H		
MMP-11		H			
MMP-12	H M	H M			H
MMP-13	H	H	H		H
MMP-14	H	H			
MMP-15		H			
MMP-16/MT3-MMP	H	H			
MMP-24/MT5-MMP	H	H M			
MMP-25/MT6-MMP		H			
MMP-26		H			
TIMP-1	H M R	H M R	H M R	H	
TIMP-2	H	H	H		
TIMP-3	H	H			
TIMP-4	H	H	H		
Plasminogen	H	H			
Plasminogen Kringle 5		M			
Serpin E1/PAI-1	H	H M	H		H
uPA	H	H			
uPAR	H M	H M	H		
Vitronectin	H B	M			

Key: H Human M Mouse R Rat B Bovine

Table 1. Fluorogenic Peptide Substrates for MMP Activity Assays

MMP	SUBSTRATE CATALOG #
MMP-1, 2, 7, 8, 9, 12, 13, 14, 16	ES010, ES001
MMP-3, 10	ES002

Table 2. DuoSet ELISA Kits to measure human MMP/TIMP complexes

	TIMP-1	TIMP-2	TIMP-4
MMP-1	Catalog # DY1550	Catalog # DY1553	Catalog # DY1554
MMP-2	Catalog # DY1496	Catalog # DY1497	Catalog # DY1498
MMP-3	Catalog # DY1467	Catalog # DY1468	Catalog # DY1469
MMP-9	Catalog # DY1449	Catalog # DY1453	Catalog # DY1450

Each kit provides reagents for 15 96-well plates. Add "E" after the catalog # to obtain enough reagents for 45 plates.

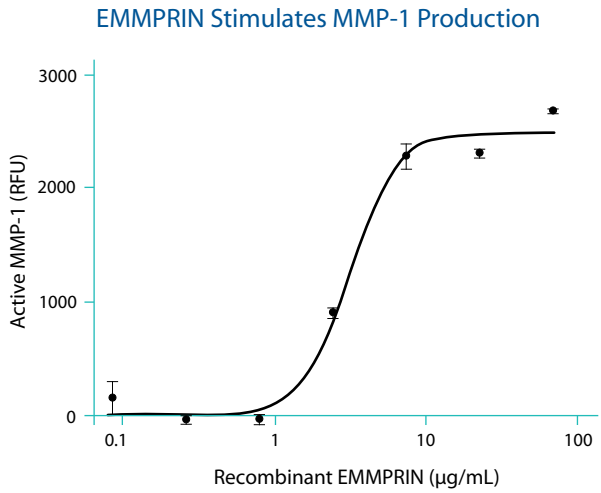


Figure 1. Normal human lung fibroblast cells were cultured on microplates coated with recombinant human EMMPRIN/Fc chimera (Catalog # 972-EMN) for 3 days. EMMPRIN stimulated a dose-dependent increase in levels of active MMP-1 in the culture supernatant as measured using the Fluorokine® E Human MMP-1 Kit (Catalog # F1M00).

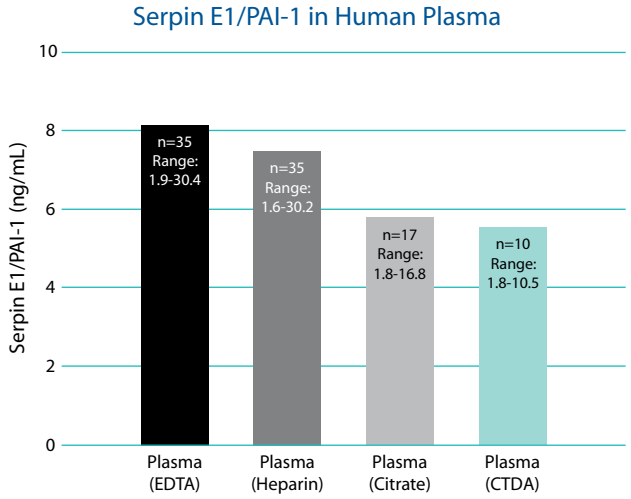


Figure 2. The human Serpin E1/PAI-1 Quantikine ELISA Kit (Catalog # DSE100) was used to measure the mean levels of serpin E1/PAI-1 in human plasma in the presence of different anticoagulants.

Cancer Immune Surveillance

Early stage cancers often elicit a vigorous immune response that can eliminate or contain the cancerous cells. This immune surveillance is mediated via recognition of tumor-specific antigens or other danger signals, and requires the coordinated functioning of immune effector cells, regulatory cells, and antigen-presenting cells.

A variety of mechanisms that alter the tumor or immune environments allow for tumor cells to escape this immune surveillance. T cell-mediated tumor cell lysis may be abrogated by down-regulation or alteration of tumor-specific antigens or MHC molecules. Tumor cells often down-regulate critical adhesion molecules or co-stimulatory molecules that activate T cells and NK cells. In some cases, tumors effect the up-regulation of inhibitory receptors or ligands. Loss of specific homing receptors may reduce lymphocyte infiltration into tumors. Factors secreted from tumor cells often inhibit the function of immune effector cells or antigen presenting cells, or alternatively may result in impaired hematopoiesis. Resistance to apoptosis is another mechanism utilized to permit tumor progression. The intrinsic plasticity of tumor cells permits them to evolve and exploit a variety of immunological weaknesses, thereby allowing escape from immune surveillance.

Cancer Immune Surveillance Products

MOLECULES	PROTEINS	ANTIBODIES	ELISAs/ASSAYs
B7-1/CD80	H M R	H M R	H M
B7-2/CD86	H M R	H M R	
B7-H1/PD-L1	H M	H M	
Bcl-2	H	H M R	H
CD40/TNFRSF5	H M	H M	M
CD58/LFA-3	H	H	
CD155/PVR	H	H	
CD200	H M	H M	
CRTAM	H M	H	
DcR3/ TNFRSF6B	H	H	H
DNAM-1	H	H	
Fas/TNFRSF6	H M R F	H M R F	H M
Fas Ligand/ TNFSF6	H M R	H M R	H M
H60	M	M	
ICAM-1/CD54	H M R	H M R	H M R
IFN-γ	H M R B Ca CR E F P Pr	H M R B Ca CR E F P Pr	H M R Ca CR F P
IGSF4A/ SynCAM	H M	M	
IGSF4B		H	
IL-6	H M R Ca CR E F P	H M R Ca CR E F P	H M R Ca P
IL-10	H M R Ca CR E F P V	H M R Ca CR E F P V	H M R Ca F P
IL-12	H M R Ca F P Pr	H M R P	H M
M-CSF	H M	H M	H M
MAdCAM-1	M	M	M

MOLECULES	PROTEINS	ANTIBODIES	ELISAs/ASSAYs
MICA, MICB	H	H	H
MULT-1	M	M	
Nectin-2	H	H	
NKG2D	H M	H M	
PD-1	H M	H M	
PGE2			Ms
Rae-1		M	
Rae-1α, β, δ	M		
Rae-1ε, γ	M	M	
TGF-β		Ms	
TGF-β1	H P	Ms	H M R Ca P
TGF-β1.2	H	Ms	
TGF-β2	H P	Ms	H
TGF-β3	H	Ms	H
TGF-β5	A	Ms	
TNF RI/ TNFRSF1A	H M	H M	H M
TRAIL/ TNFSF10	H	H M	H
TRAIL R1/ TNFRSF10A	H	H	
TRAIL R2/ TNFRSF10B	H M	H M	
TRAIL R3/ TNFRSF10C	H	H	H
TRAIL R4/ TNFRSF10D	H	H	H
ULBP-1, -2, -3	H	H	
VEGF	H M R Ca Z	H M R Ca Z	H M R Ca

Key: H Human M Mouse R Rat A Amphibian B Bovine Ca Canine CR Cotton Rat E Equine F Feline Ms Multi-species P Porcine Pr Primate V Viral Z Zebrafish

DcR3 in Stomach Cancer Tissue

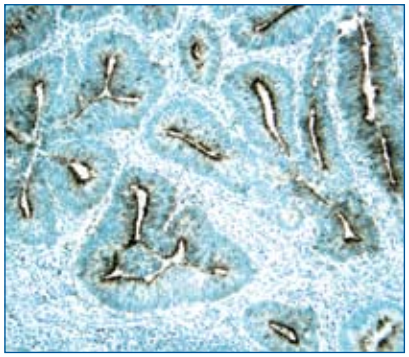


Figure 1. Detection of DcR3 in a paraffin-embedded human stomach cancer tissue section using anti-human DcR3 affinity-purified polyclonal antibody (Catalog # AF142) and Antigen Retrieval Reagent - Basic (Catalog # CTS013). Tissue was stained using Anti-goat HRP-DAB Cell and Tissue Staining Kit (Catalog # CTS008; brown) and counterstained with hematoxylin (blue).

CD19⁺/CD200⁺ Cells Detected by Flow Cytometry

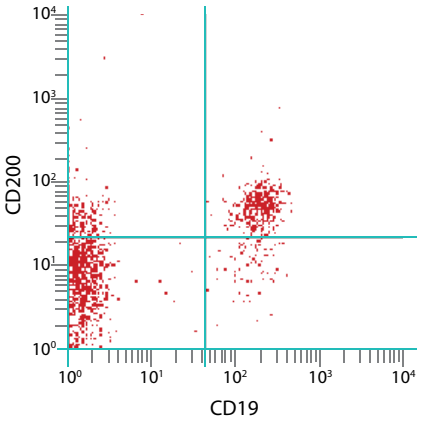


Figure 2. CD19⁺/CD200⁺ lymphocytes detected by flow cytometry. Human CD19⁺ lymphocytes were stained with anti-CD200 monoclonal antibody (Catalog # MAB27241) followed by PE-conjugated anti-mouse secondary antibody (Catalog # F0102B).

TGF-β1 Inhibits IL-4-induced Proliferation

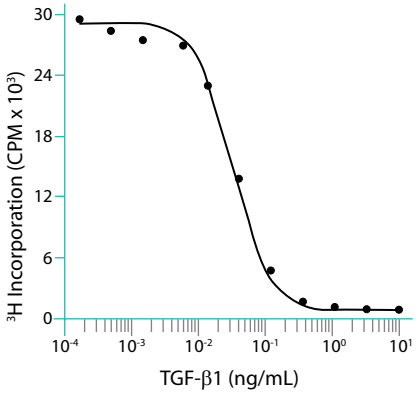


Figure 3. Human TGF-β1 (Catalog # 100-B) inhibits HT-2 cell (mouse T cell line) proliferation stimulated by recombinant mouse IL-4 (Catalog # 404-ML).

Receptor Tyrosine Kinases & Oncogenic Transformation

An oncogene (from Greek *onkos*, meaning "mass/tumor", and *gennan*, meaning "to produce") is a gene that brings about, or contributes to, neoplastic transformation. The term oncogene is often used for an aberrantly performing gene that has either arisen spontaneously or been induced by external influences. The precursor of a cellular oncogene is termed a proto-oncogene, which typically plays a role in normal growth, differentiation, and repair. The receptor tyrosine kinases (RTKs) are a large group of proto-oncogenes that contain more than 50 members. All have constitutively inactive kinase domains; however, mutation or gene amplification can result in inappropriate receptor activation. This is often considered the underlying cause of neoplastic transformation. R&D Systems offers a wide variety of reagents for the investigation of RTK expression and activation.

Receptor Tyrosine Kinase Products

MOLECULE	PROTEINS	ANTIBODIES	ELISAs/ASSAYs
Axl	H M	H M	H M
DDR1, DDR2		H	
EGF R	H M	H M	H
EphA1, EphA2	H M	H M	
EphA3, EphA4	M	M	
EphA5	H M R	M R	
EphA6, EphA7, EphA8	M	M	
EphB1	R	R	
EphB2, EphB3	M	M	
EphB4	H M	H M	
EphB6	H M	M	
ErbB2, B3, B4	H	H	H

MOLECULE	PROTEINS	ANTIBODIES	ELISAs/ASSAYs
FGF R1	H	H	
FGF R2, FGF R3	H M	H M	H
FGF R4	H	H M	
Flt-3	H M	H M	H
HGF R	H M	V	H M
IGF-I R	H	H	H
IGF-II R	H	H	
INSRR		H	
Insulin R/ CD220	H	H	H
M-CSF R	H M	H	H
Mer	H M	H M	
MSP R/Ron	H M	H M	H

MOLECULE	PROTEINS	ANTIBODIES	ELISAs/ASSAYs
MuSK		H R	
PDGF Rα, Rβ	H M	H M	H
Ret	H M	H M	
ROR1, ROR2		H	
SCF R/c-kit	H	H M	H
Tie-1	H	H	
Tie-2	H M Z	H M Z	H M
TrkA	H R	H M R	H
TrkB, C	H M	H M	
VEGF R1, R2, R3	H M	H M	H M

Key: H Human M Mouse R Rat V Viral Z Zebrafish

Phospho-EGF R Cell-Based Assay

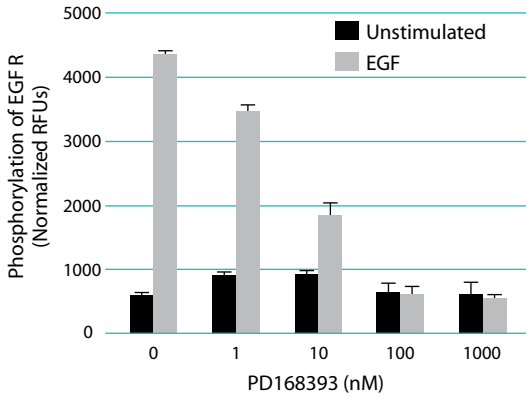


Figure 1. Phosphorylation of EGF R (Y1068) was determined in whole cells using the human Phospho-EGF R (Y1068) Cell-Based ELISA Kit (Catalog # KCB1095) and normalized to total EGF R in the same well. A431 cells (epidermoid carcinoma) were pretreated with PD168393 (tyrosine kinase inhibitor), and then incubated with or without EGF (Catalog # 236-EG). Values represent mean ± the range of duplicate determinations.

Phospho-EGF R by Flow Cytometry

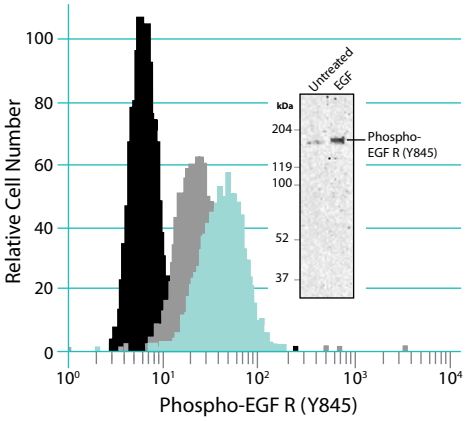


Figure 3. A431 cells were untreated (gray histogram) or treated with EGF (light aqua histogram). Phosphorylated EGF R was detected by flow cytometry using carboxyfluorescein (CFS)-conjugated anti-phospho-EGF R (Y845) antibody (Catalog # IC3394F). Cells were also stained with an isotype control antibody (Catalog # IC105F; black histogram). The inset shows Western blot detection of phosphorylated EGF R using anti-human phospho-EGF R (Y845) polyclonal antibody (Catalog # AF3394).

Receptor Tyrosine Kinase Array

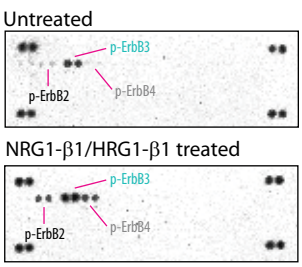
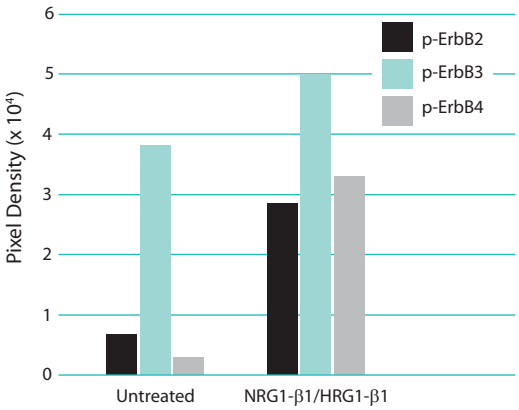


Figure 2. Relative phosphorylation was measured simultaneously in 42 RTKs using the Proteome Profiler™ RTK Array (Catalog # ARY001). MDA-MB-453 cells (human breast cancer) were left untreated or treated with recombinant human NRG1-β1/HRG1-β1 (Catalog # 396-HB).



Please see our website for our wide selection of antibodies for total and phosphorylated RTKs.

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Signaling through the TOR Pathway

Mammalian TOR (target of rapamycin) is a serine/threonine kinase and member of the PI 3-kinase-related kinase (PIKK) family. TOR is the protein target of rapamycin, an anti-rejection drug used in transplantation and is also a promising anti-cancer agent. The TOR kinase responds to growth factors and nutrient availability, controlling cell growth, proliferation, and survival. TOR is an effector of growth factor-induced PI 3-kinase/Akt and Ras/ERK signal transduction pathways, while nutrient availability signals are relayed through TOR by the LKB1/AMPK pathway. The major downstream effectors of the TOR kinase are 4E-BP1 and p70 S6 protein kinase 1 (S6K1), factors involved in translation initiation.

TOR is phosphorylated at S2448 in a wortmannin-sensitive manner, and the region of TOR surrounding S2448 has been shown to be part of a repressor domain. Incubation with an anti-TOR antibody against this region or deletion of this region enhances kinase activity. Recent evidence suggests that TOR is phosphorylated at S2448 by S6K1, rather than a direct phosphorylation by Akt protein kinase. Phosphorylation at S2448 activates TOR to effect the downstream control of cell growth and survival.

TOR-related Products

MOLECULE	ANTIBODIES	ELISAs/ ASSAYs
4EBP1	H M	
Akt	H M R	H M R
Akt1	H M R	H M R
Akt2	H M R	
Akt3	H	
AMPK α1/2	H	
AMPK α1	H M R	
AMPK α2	H M R	
AMPK β1	H M R	
AMPK β2	H M R	
B-Raf	H M R	
c-jun	H	
β-Catenin	H M R X	H
Elk-1	H M R	
ERK1/ERK2	H M R	H M R
ERK1	H M R	H M R
ERK2	H M R	H M R
ERK3	H	
ERK5/BMK1	H M	
GLI-1	H	
GSK-3α	H	
GSK-3β	H M R	H M R

MOLECULE	ANTIBODIES	ELISAs/ ASSAYs
HIF-1α	H M R	H M
MEK1/MEK2	H M R	H
MEK1	H M R	
MEK2	H M R	
MKK3/MKK6	H M R	
MKK3	H M R	
MKK4	H M R	
MKK6	H M R	
MKK7	H	
p70 S6 Kinase	H M R	H M R
p70 S6 Kinase β	H	
PDK-1	H	
PI 3-Kinase p85α	H M R	
PI 3-Kinase p110β	H	
PI 3-Kinase p110δ	H	
PI 3-Kinase p110γ	H	
PTEN	H M R	H M R
Raf-1	H M R X	
Ras	H M R	
Rheb	H M R	
TOR	H M R	H

Key: H Human M Mouse R Rat X *Xenopus*

Phospho-Akt Surveyor™ IC ELISA

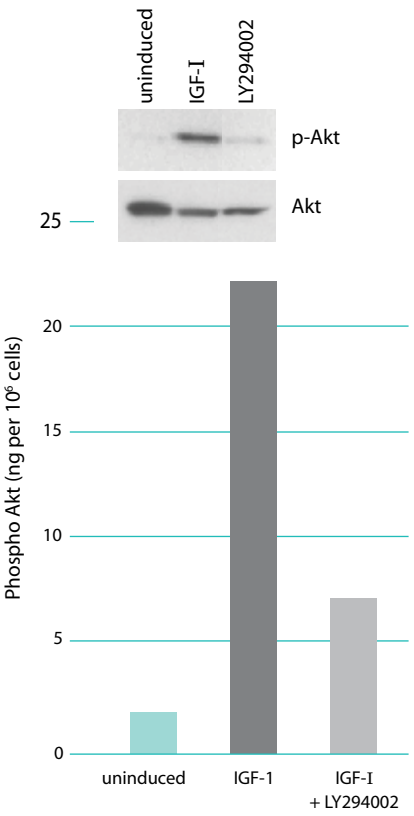

Figure 1. The Phospho-Akt (S473) Pan Specific Surveyor™ IC Immunoassay (Catalog # SUV887) was used to quantify Akt phosphorylation. MCF-7 cells were untreated, or treated with IGF-I, either with or without the PI 3-Kinase inhibitor LY294002. The Surveyor IC Immunoassay results correlate well with the amounts of phosphorylated Akt detected by Western blot.

Phospho-TOR Surveyor IC ELISA

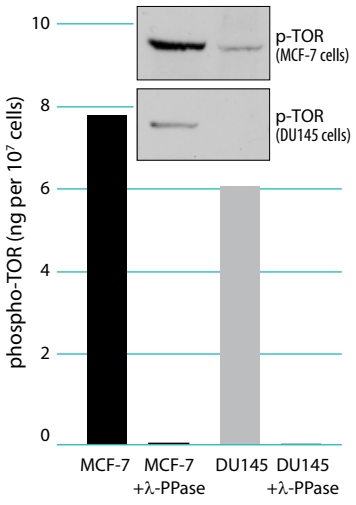

Figure 2. Phosphorylated TOR (S2448) quantified using the human Phospho-TOR (S2448) Surveyor IC Immunoassay (Catalog # SUV1665) is consistent with the amounts of phosphorylated TOR determined by qualitative Western blot analysis (inset). Exponentially growing MCF-7 and DU145 cells were harvested and the indicated cellular extracts were treated with λ-phosphatase (λ-PPase) prior to analysis.

Phospho-ERK1/2 Surveyor IC ELISA

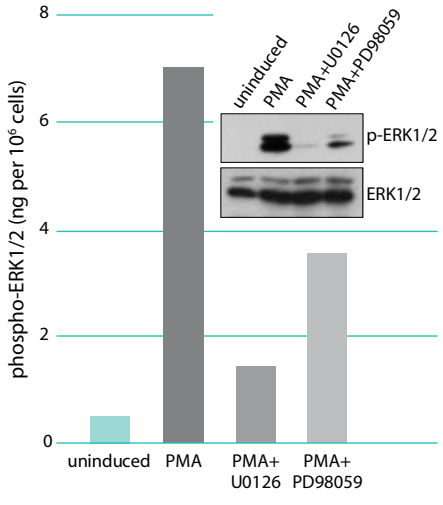

Figure 3. Phosphorylated ERK1 and ERK2 were quantified with the Surveyor IC Immunoassay (Catalog # SUV1018). HeLa cells were incubated with or without PMA for 20 minutes, either with or without the MEK1/2 inhibitors U0126 or PD98059. The Surveyor IC Immunoassay results correlate well with the total amounts of phosphorylated ERK1/2 detected by Western blot (inset).

The Pivotal Role of β-Catenin in Cancer

β-Catenin is a cytosolic protein that contributes to numerous cellular activities, including proliferation, differentiation, migration, and intercellular adhesion. This multifunctional molecule has the potential to affect tumorigenesis at several levels. Cytoplasmic β-catenin concentrations are regulated by GSK-3β-mediated phosphorylation and subsequent proteosomal β-catenin degradation. Activation of the canonical Wnt pathway inhibits GSK-3β activity, increasing cytoplasmic β-catenin and its downstream effects on transcription. β-catenin also links cadherins with the cytoskeleton where it contributes to intercellular adhesion. E-cadherin is an epithelial-expressed adhesion molecule that is commonly decreased in many carcinomas. Reduction of E-cadherin is correlated with the degree of tumor invasion/metastasis, likely due to a lack of cell-cell adhesion. However, loss of E-cadherin expression may also influence tumor progression by increasing free cytoplasmic β-catenin, leading to dysfunctional cell growth/survival.

E-Cadherin in Epidermoid Carcinoma Cells

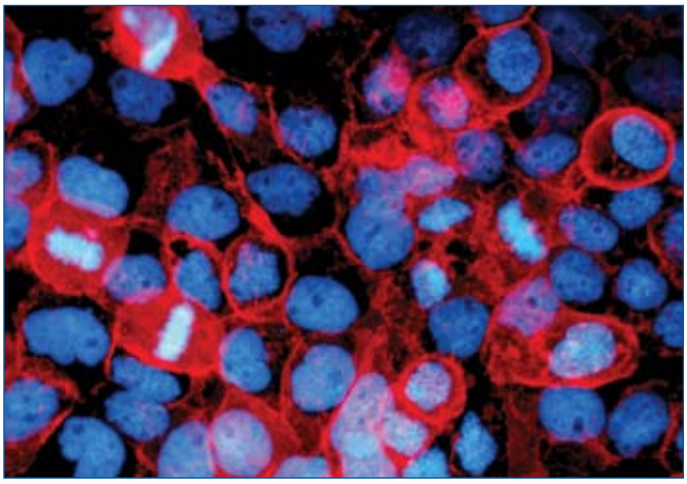

Figure 1. E-cadherin was detected at the junctions of human epidermoid carcinoma cells using goat anti-human E-cadherin affinity purified polyclonal antibody (Catalog # AF648). Cells were stained with NorthernLights™-547 anti-goat IgG secondary antibody (Catalog # NL004; red) and counterstained with DAPI (blue).

β-Catenin-related Products

MOLECULE	PROTEINS	ANTIBODIES	ELISAs/ASSAYs
Axin-1		H M R	
E-Cadherin	H M	H M	H M
N-Cadherin	H	H	
β-Catenin		H M R X	H
DEP-1/CD148	H	H M R	H
Dishevelled-1		H	
Frizzled-1	M	H M	
Frizzled-4	M	H M	
Frizzled-5	H	H	
Frizzled-6		H M	
Frizzled-7	M	H M	
Frizzled-8	M	M	
Fyn		H M R	
GSK-3 α/β		H M R	H M R
GSK-3α		H	
GSK-3β		H M R	H M R
LRP-6	H M	H M	
PTP1B	H	H M R	H
Pygopus-1		H M	
SHP-1		H M R	H M R
Src		H M R	
Wnt-1		M	
Wnt-3a	M	M	
Wnt-7a	H	H	
Wnt-7b		H	
Wnt-10b		M	
Yes		H M R	

Key: H Human M Mouse R Rat X *Xenopus*

Quantification of β-Catenin in Human Cell Lines

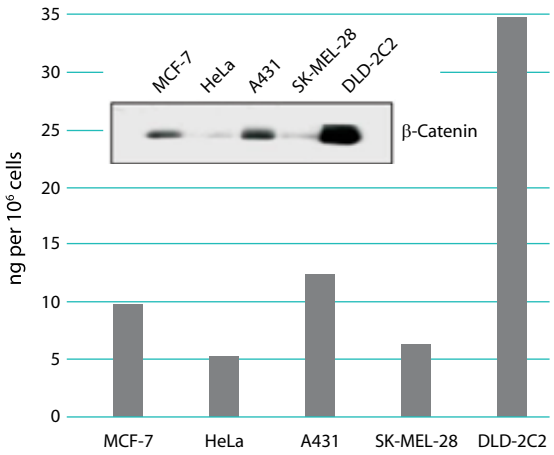

Figure 2. The levels of β-catenin were quantified with the DuoSet® IC ELISA (Catalog # DYC1329) from lysates prepared from human MCF-7, HeLa, A431, SK-MEL-28, and DLD-2C2 cells. The same lysates were also immunoblotted (inset) with an anti-β-catenin monoclonal antibody (Catalog # MAB1329). The DuoSet IC ELISA results correlate well with the total amounts of β-catenin detected by Western blot.

E-Cadherin Detection by Flow Cytometry

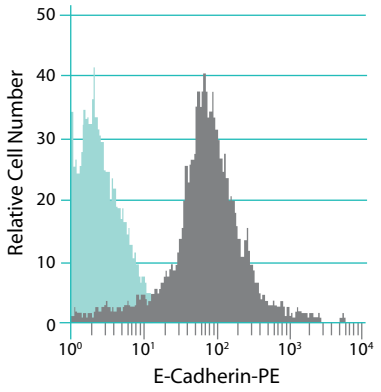

Figure 3. Human breast adenocarcinoma cells (MCF-7) stained with phycoerythrin (PE)-conjugated anti human E-Cadherin (Catalog # FAB18381P; charcoal) or an isotype control antibody (Catalog # IC0041P; light aqua).

The Hypoxia & Cancer Biomarker Carbonic Anhydrase IX/CA9

Hypoxia is an independent prognostic cancer indicator that influences tumor development, progression, and the response to therapy. One method used to gain insight into the oxygenation status of a tumor is through the measurement of surrogate biomarkers. Carbonic anhydrase IX (CA9) is a transmembrane carbonic anhydrase that regulates pH by catalyzing the reversible hydration of carbon dioxide to carbonic acid, which subsequently decomposes to HCO_3^- and H_3O^+. CA9 is one of the major targets of hypoxia-inducible factor (HIF-1). CA9 is up-regulated in many cancers and is associated with tumor aggressiveness where it may promote growth and metastasis through promotion of an acidic microenvironment. The ectodomain of CA9 can be released extracellularly and soluble CA9 has been detected in cell culture medium and biological fluids.

R&D Systems now offers several tools to facilitate CA9 research (Table 1; Figures 1-3). For instance, our new Quantikine® Immunoassay Kit allows for simple, fast, sensitive, and specific measurement of CA9 levels in blood and cell culture supernatant. It has a detection range of 15.6-1000 pg/mL and a typical minimum detectable dose of 2.28 pg/mL. This assay is designed specifically for CA9 and has no cross-reactivity with any of the other 14 known carbonic anhydrases.

Table 1. R&D Systems human CA9 research tools

REAGENTS	APPLICATIONS	CATALOG NUMBER
Recombinant protein	Enzymatic assays, etc.	2188-CA
Polyclonal antibody	WB, IP, FC, IHC	AF2188
Biotinylated antibody	WB	BAF2188
Monoclonal antibody	IP, FC, IHC	MAB2188
Quantikine ELISA Kit	Quantification	DCA900

Key: WB Western blot, IP immunoprecipitation, FC flow cytometry, IHC immunohistochemistry

CA9 Levels in Human Blood

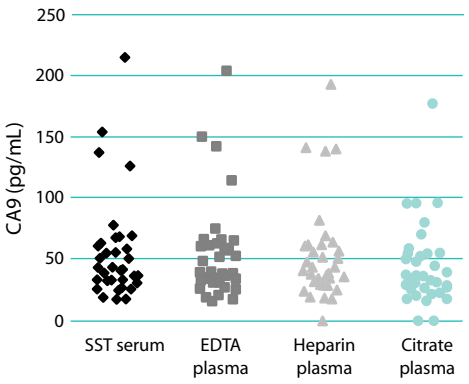

Figure 1. Quantification of CA9 using the Quantikine CA9 Immunoassay Kit (Catalog # DCA900) in different blood samples obtained from healthy individuals.

CA9 Detection by Flow Cytometry

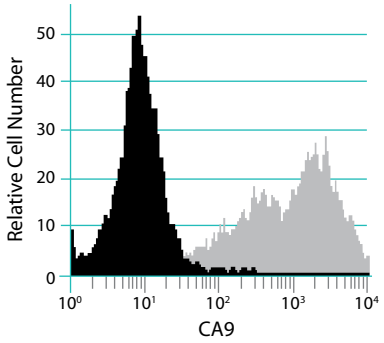

Figure 2. HeLa cells were incubated with anti-human monoclonal CA9 antibody (Catalog # MAB2188; light gray histogram) or isotype control (Catalog # MAB0031; black histogram). Cells were stained with goat anti-mouse allophycocyanin (APC) -conjugated secondary antibody (Catalog # F0101B).

CA9 in Colon Cancer Tissue

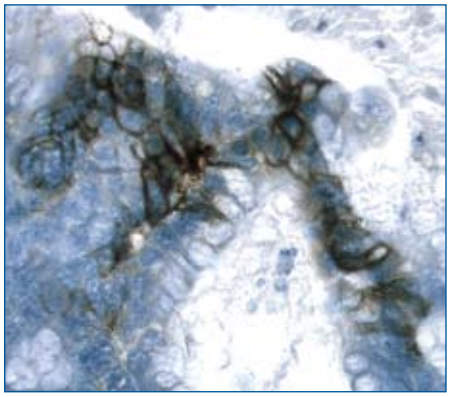

Figure 3. Detection of CA9 in a paraffin-embedded human colon cancer tissue section using goat anti-human CA9 affinity-purified polyclonal antibody (Catalog # AF2188). Tissue was stained using anti-goat HRP-DAB Cell and Tissue Staining Kit (Catalog # CTS008; brown) and counterstained with hematoxylin (blue).

Quality | Selection | Performance | Results

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