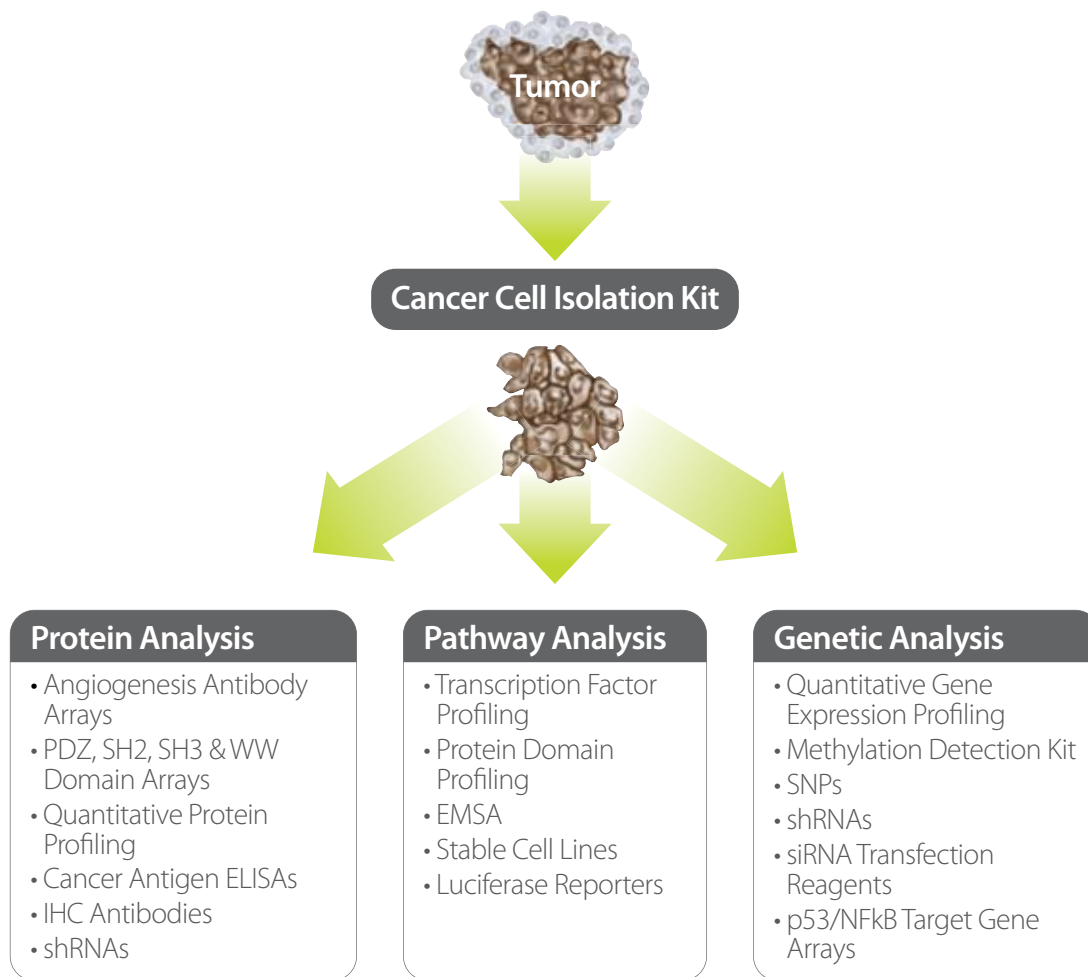


Solutions for Cancer Research



In the study of cancer biology, researchers have identified multiple proteins that are either associated with cancer susceptibility or commonly misregulated in cancer cells. Known as cancer biomarkers, many of these proteins have been identified as transcription factors and signaling molecules. Elucidating the mechanisms of action of these proteins will help researchers to understand cancer and design appropriate therapies.

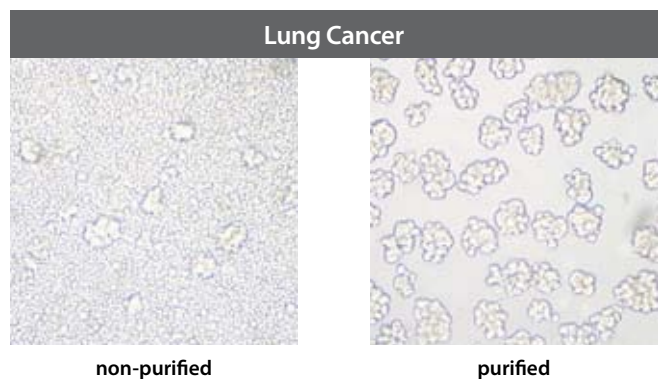
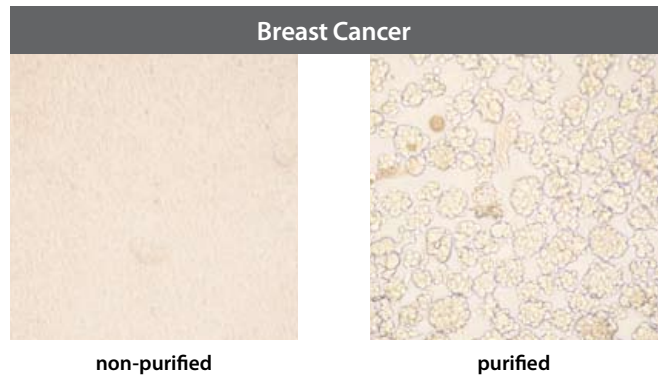
At Panomics, we have developed a variety of reliable and cost-effective novel technologies to facilitate multifunctional analysis of signaling pathways, transcriptional regulation, and gene expression in cancer cells. Whether you are engaged in basic or translational cancer research, our products are designed to help address all your research needs.

Purify Any Population of Cancer Cells

- Purify cancer cells from fresh biopsy samples
- Establish primary cell lines or use for biochemical assays
- Wide range of applications: genetic analysis, biomarker identification, etc.

With the same amount of starting biopsy material required for conventional methods, Panomics' **Cancer Cell Isolation Kit** can be used to isolate a much greater quantity of cancer cells. Unlike conventional techniques, this straightforward method requires no specialized skill set and no expensive equipment, and can be used to isolate any cancer cell type. Pure cancer cell populations can then be used directly for proteomics applications such as identification of biomarkers, or for RNA-based applications such as microarray hybridization and genetic analysis. Alternatively, because the whole cell isolation procedure preserves cell integrity, cells can be used to establish primary cell lines.

Product	Size	Catalog #
Cancer Cell Isolation Kit (2)	2 Assays	CI0002
Cancer Cell Isolation Kit (4)	4 Assays	CI0004
Cancer Cell Isolation Kit (10)	10 Assays	CI0010



Detect Multiple Angiogenesis Activator and Inhibitor Proteins Simultaneously

- Simultaneously profile expression of multiple proteins associated with angiogenesis
- Analyze the effects of different stimuli on the induction or inhibition of angiogenesis

With the **Angiogenesis Antibody Arrays**, you can profile 18 factors associated with angiogenesis in a single reaction. These arrays are compatible with cell and tissue extracts, conditioned cell culture media, sera and plasma samples.

Product	Size	Catalog #
Human Angiogenesis Antibody Array	Kit	MA6310
Mouse Angiogenesis Antibody Array	Kit	MA6320

Quickly Quantify Cancer Antigen Concentrations in Human Serum

Panomics' **Cancer Antigen ELISA Kits** allow rapid, simultaneous screening of up to 96 samples for quantitative determination of tumor marker concentration. We currently offer assays for the analysis of four different cancer antigens: AFP, CA125, CA15-3, and CA19-9.

Product	Size	Catalog #
AFP ELISA Kit	Kit	BC1009
CA125 ELISA Kit	Kit	BC1013
CA15-3 ELISA Kit	Kit	BC1015
CA19-9 ELISA Kit	Kit	BC1017

Perform High-Throughput Analysis of TF Activation

- Profile the binding activities of multiple transcription factors at once
- Monitor cross-talk between intracellular signaling cascades
- Characterize promoter regions of novel genes
- Determine new mechanisms of transcriptional regulation

Panomics offers two different technology platforms for the analysis of TF activation. Our membrane-based **Protein/DNA Arrays** offer an ideal system for monitoring the regulation of 345 different transcription factors simultaneously. These arrays can be used to analyze the effects of cancer-targeted therapies, shed light on key pathways involved in cancer misregulation, or identify novel pathways related to tumorigenesis.

Our second platform, **Procarta Multiplex Protein Profiling Assays**, employs a new multiplex assay format based on the Luminex microsphere technology. This highly sensitive assay allows accurate quantitation of transcription factor binding affinity.

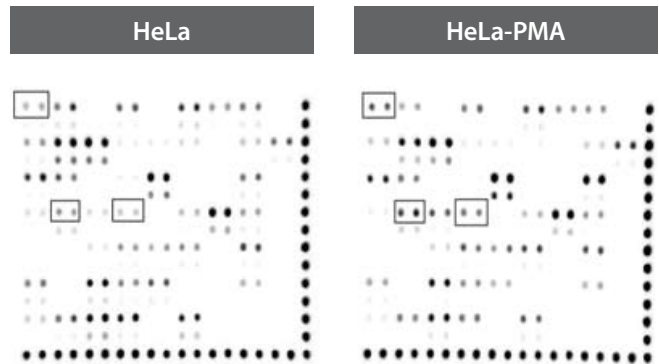
References:

Bone marrow stroma influences transforming growth factor- β production in breast cancer cells to regulate c-myc activation of the preprotachykinin-I gene in breast cancer cells. *Cancer Res.*, H. S. Oh et al., 2004, 64: 6327–6336.

CD95 ligand induces motility and invasiveness of apoptosis-resistant tumor cells. *EMBO J.*, B. C. Barnhart et al., 2004, 23: 3175–3185.

Malignant transformation of melanocytes to melanoma by constitutive activation of MAP kinase signaling. *J. Biol. Chem.*, B. Govindarajan, et al., 2003, 278 (11): 9790-9795.

Evidence that sequence homologous region in LRAT-like proteins possesses anti-proliferative activity and DNA binding properties: translational implications and mechanism of action. *Carcinogenesis*, D. P. Simmons et al., 2006, 27(4): 693-707.



Transcription factor activation profile. The activation of transcription factors is easily detected using 15 μ g of HeLa nuclear extract from untreated cells (HeLa) and cells treated with 20ng/ml PMA (HeLa-PMA)

Product	Size	Catalog #
Protein/DNA Array I	Kit	MA1210
Protein/DNA Array II	Kit	MA1211
Protein/DNA Array III	Kit	MA1212
Protein/DNA Array IV	Kit	MA1213
Protein/DNA Array V	Kit	MA1214
Combo Protein/DNA Array	Kit	MA1215

Refill kits are available for all the Protein/DNA Arrays. Call us for additional info or visit our website at www.panomics.com.

Profile the Expression Patterns of Genes Regulated by NF κ B or p53

- Monitor the expression of genes regulated by p53 & NF κ B
- Determine which target genes are transcribed upon cellular stimulation

Panomics' **NF κ B** and **p53 Target Gene Arrays** offer an easy-to-use, membrane-based assay format for analyzing transcription of multiple p53 or NF κ B target genes simultaneously.

Product	Size	Catalog #
Human p53 Target Gene Array	Kit	MA2010
Mouse p53 Target Gene Array	Kit	MA2011
Human NF κ B Target Gene Array	Kit	MA2020
Mouse NF κ B Target Gene Array	Kit	MA2021

Refill kits are available for all the Target Gene Arrays. Call us for additional info or visit our website at www.panomics.com.

References:

Activation of the nuclear factor kappa B pathway following ischemia-reperfusion of the murine testis. *J Androl.*, J. J. Lysiak et al., 2005, 26: 129–135.

Expression of angiogenic factors vascular endothelial growth factor and interleukin-8/CXCL8 is highly responsive to ambient glutamine availability: Role of nuclear factor-kappaB and activating protein-1. *Cancer Res.*, E. V. Bobrovnikova-Marjon et al., 2004, 64: 4858–4869.

p53 gene targets are regulated by laminin-2 in conjunctival epithelium. *Invest. Ophthalmol. Vis. Sci.*, L.K. Mrock and L. Prach et al., 2004, 45: 1499.

NF κ B and p53 are the dominant apoptosis-inducing transcription factors elicited by the HIV-1 envelope. *J. Exp. Med.*, J. L. Perfettini et al., 2004, 199: 629–640.

Profile Gene Expression with Unparalleled Accuracy and Precision

- RNA quantitation directly from crude cell lysates or tissue homogenates
 - No RNA purification
 - No reverse transcription
 - No PCR
- Measure multiple RNA targets simultaneously
- Simple ELISA-like workflow
- Ideal for RNAi knockdown, microarray validation, predictive toxicology and secondary screening

QuantiGene® Reagent System is a sandwich nucleic acid hybridization assay that provides a unique approach for RNA detection and quantification by amplifying the reporter signal using branched DNA (bDNA) technology. By measuring RNA directly from crude cell lysates or tissue homogenates, the assay avoids variations or errors inherent to extraction and amplification of target sequences. Branched DNA technology is the basis of clinically proven viral load tests commercialized by Bayer Corporation and has been in practice for over a decade in drug discovery and development applications.

The **QuantiGene Plex** assay combines two technologies, branched DNA (bDNA signal amplification technology) and xMAP® (multi-analyte profiling beads). Together they enable simultaneous detection and quantification of 3-30 RNA targets directly from cell lysates, tissue homogenates (animal or plant) or purified RNA.

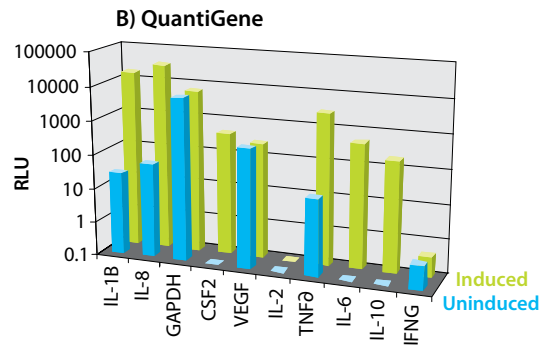
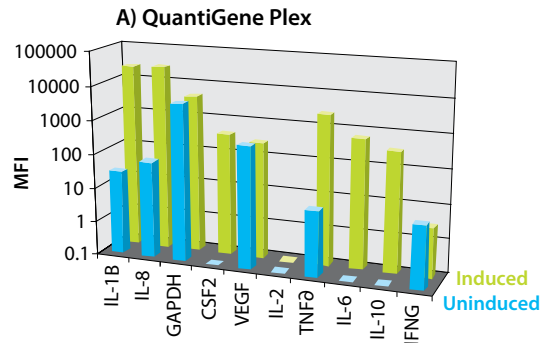
References

Small interfering RNA and gene expression analysis using a multiplex branched DNA assay without RNA purification. *J. Biomol. Screen.*, A. Zhang et al., 2005, 10(6): 549-556.

RNAi of FACE1 protease results in growth inhibition of human cells expressing lamin A: implications for Hutchinson-Gilford progeria syndrome. *J. Cell Sci.*, J. Gruber et al., 2005, 118: 689-696.

Differential expression of mouse hepatic transporter genes in response to acetaminophen and carbon tetrachloride. *Tox. Sci.*, M. Aleksunes et al., 2005, 83: 44-52.

Therapeutic silencing of an endogenous gene by systemic administration of modified siRNAs. *Nature*, J. Soutschek et al., 2004, 432: 173-178.



Induction of cytokine gene expression in U937 cells treated with PMA/LPS. The quantitation of cytokine gene expression was made by multi- (A) or single-plex QuantiGene (B).

Product	Size	Catalog #
QuantiGene Explore Kit	192 assays	QG0001
QuantiGene Discover Kit	960 assays	QG0002
QuantiGene Discover-XL Kit	4800 assays	QG0003
QuantiGene Screen Kit	4800 assays	QG0004

Product	Size	Catalog #
QuantiGene Plex Assay Kit	96 assays	QGP-000-001
QuantiGene Plex Assay Kit	3 x 96 assays	QGP-000-003
QuantiGene Plex Assay Kit	10 x 96 assays	QGP-000-010
QuantiGene Plex Set, By Request	03-30 plex 96 assays	QGP-001-Z##
QuantiGene Plex Set, By Request	03-30 plex 3 x 96 assays	QGP-003-Z##
QuantiGene Plex Set, By Request	03-30 plex 10 x 96 assays	QGP-010-Z##

defines the number of plex

Transfect siRNA into Difficult-to-Transfect Cell Types

- Efficient siRNA delivery into difficult-to-transfect cell types
- Novel peptide-based, non-endosomal delivery mechanism
- High cell viability at optimal delivery conditions
- Validated cell protocols for many cell types

DeliverX™ Transfection Reagent is based on novel “MPG” delivery technology developed at Centre de Recherches en Biochimie Macromoléculaire (CNRS) in Montpellier (France) in the laboratory of Dr. F. Heitz and Dr. G. Divita.

MPG technology uses virus-derived amphipathic peptides that directly interact with nucleic acid cargos to form nanoparticles (150-200 nm) capable of diffusing through plasma membranes and releasing their contents inside the cell. The mechanism of entry is receptor-independent, involves MPG/lipid interactions and avoids the endocytic pathway, thereby preventing endosomal or lysosomal degradation of cargos.

DeliverX Plus siRNA Transfection Kits contain validated cell specific protocols and a certificate of analysis. In addition, these kits undergo stringent quality control and functional testing.

References

- Cytoplasmic and nuclear retained DMPK mRNAs are targets for RNA interference in myotonic dystrophy cells. *J. Biol. Chem.* M. A. Langlois et al., 2005, 280(17): 16949-16954.
- Small interfering RNA induced transcriptional gene silencing in human cells. *Science.* K. V. Morris et al., 2004, 305: 1289-1291.
- On mechanism of non-endosomal peptide-mediated cellular delivery of nucleic acids. *Biochem. Biophys. Acta.* S. Deshayes et al., 2004, 1667(2): 141-7.
- An insight into the mechanism of the peptide-based gene delivery system MPG: implications for delivery of siRNA into mammalian cells. *Nucleic Acid Res.* F. Simeoni et al., 2003, 31: 2717-2724.

Product	Size	Catalog #
DeliverX—siRNA Transfection Evaluation Kit	0.12 mL	DX0001
DeliverX—siRNA Transfection Kit	0.4 mL	DX0002
DeliverX—siRNA Transfection Kit	1.0 mL	DX0003
DeliverX—siRNA Transfection Kit	4 x 1 mL	DX0004
DeliverX Plus—siRNA Transfection Evaluation Kit	0.12 mL	DX0051
DeliverX Plus—siRNA Transfection Kit	0.4 mL	DX0052
DeliverX Plus—siRNA Transfection Kit	1.0 mL	DX0053
DeliverX Plus—siRNA Transfection Kit	4 x 1 mL	DX0054
FAM-labeled siRNA Control	0.16 mL	DX0100
Human GAPDH siRNA Control	0.06 mL	DX0101
Sonicator X100		DX0400

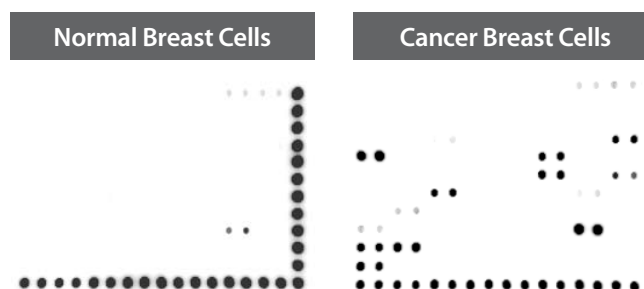
Determine the Methylation Status of Multiple Promoter Regions

- Profiles methylation status of 80+ promoter regions

To improve upon time-consuming, tedious, and expensive methods that allow the analysis of only one promoter at a time, Panomics has developed a new technology for the high-throughput analysis of promoter methylation, allowing simultaneous profiling of the methylation status of multiple different promoter regions.

The **Methylation Promoter Array** can be used to study abnormal methylation, which causes transcriptional repression of numerous genes, leading to tumor development.

We also offer **Methylation Promoter PCR Kit** for fast and easy detection of methylation status of your promoter of interest, without the hassle of chemical modification with sodium bisulfate. The kits can also be used to validate your results obtained with the Methylation Promoter Array. For a complete list of all the Methylation Promoter PCR Primers available, please visit our website at www.panomics.com/methylPCR.cfm



Data generated with the Methylation Promoter Array comparing normal vs. cancer breast cells.

Product	Size	Catalog #
Methylation Promoter Array	Kit	MA7010
Methylation Promoter PCR Kit	Kit	MP1100
PCR primers (sold separately)		MPxxxx

xxxx defines the number of primer

Perform High-Throughput Measurement of Biologically Important Readout

- Perform cell-based assays without transfection
- Screen compounds that inhibit or activate pathway components
- Evaluate uncharacterized growth factors, extracellular stimuli and upstream events in NFκB, Stat, NFAT, CREB, HIF, SRF, TAD and AP1 signaling pathways

Panomics offers **NFκB, Stat, NFAT, CREB, AP1, SRF, TAD and HIF Reporter Stable Cell Lines** for high-throughput analysis of in vivo drug efficacy and specificity. These cells also provide a reproducible, ready-to-use method for performing cell-based assays.

We currently offer NFκB Reporter Stable Cell Lines in five different cell lines: human 293T, A549, HeLa, 293, NIH3T3, and C2C12 cells. The Stat3, Stat1 Reporter Stable Cell Lines are available in HeLa cells, NFAT in HeLa & K562, CREB in CHO & 293 cells, AP1 in 293 cells, SRF in HeLa, and HIF in NIH3T3 cells. We are in the process of developing Reporter Stable Cell Lines for many other transcription factors in a variety of cell lines.

We also offer a variety of **Reporter Vectors** that provide readout for other transcription factors commonly misregulated in cancer, such as p53, E2F, GATA 1–4, Myc, and Stats 1–6. Visit our Website at <http://www.panomics.com/LR1000.cfm> for a complete list of all the Luciferase Reporter Vectors available.

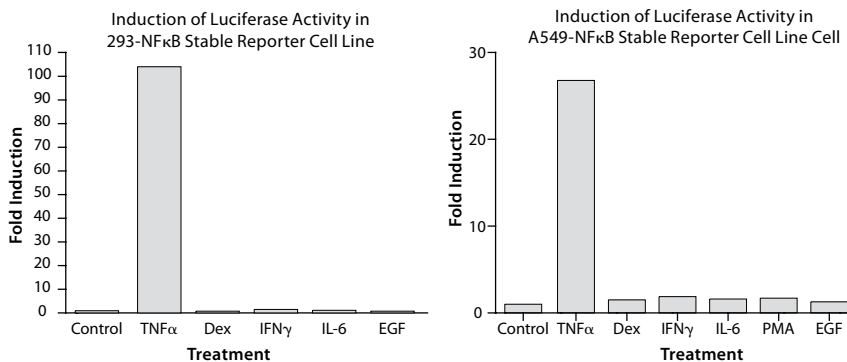
References:

Glycogen synthase kinase-3β participates in nuclear factor kappa B-mediated gene transcription and cell survival in pancreatic cancer cells. *Cancer Res.*, A. V. Ougolkov et al., 2005, 65: 2076–2081.

Product	Size	Catalog #
NFκB 293T Reporter Stable Cell Line	each	RC0001
NFκB A549 Reporter Stable Cell Line	each	RC0002
NFκB HeLa Reporter Stable Cell Line	each	RC0013
NFκB 293 Reporter Stable Cell Line	each	RC0014
NFκB NIH3T3 Reporter Stable Cell Line	each	RC0015
NFκB C2C12 Reporter Stable Cell Line	each	RC0016
Stat3 HeLa Reporter Stable Cell Line	each	RC0003
Stat1 HeLa Reporter Stable Cell Line	each	RC0004
NFAT HeLa Reporter Stable Cell Line	each	RC0005
NFAT K562 Reporter Stable Cell Line	each	RC0009

Product	Size	Catalog #
Reporter Vectors	10 μg	LRxxxx

xxxx defines the number of luciferase vector



Identify Proteins that Interact with DNA

Panomics offers more than 400 different **EMSA (Gel-Shift) Kits** for analysis of interactions of transcription factors with DNA. Our selection includes many common cancer targets, including E2F, CREB, NFκB, p53, Stat3, smad2, c-myc, AP1, and TCF/LEF.

For a complete list of all 423 available EMSA Kits, please visit our website at <http://www.panomics.com/emsakit.cfm>

References:

Rituximab (chimeric anti-CD20 monoclonal antibody) inhibits the constitutive nuclear factor-κB signaling pathway in non-Hodgkin's lymphoma B-cell lines: Role in sensitization to chemotherapeutic drug-induced apoptosis. *Cancer Res.*, A. R. Jazirehi et al., 2005, 65: 264–276.

Advanced glycation end products enhance expression of pro-apoptotic genes and stimulate fibroblast apoptosis through cytoplasmic and mitochondrial pathways. *J. Biol. Chem.*, Z. Alikhani et al., 2005, 280 (13): 12087–12095.

Interferon regulatory factor 1 binding to p300 stimulates DNA-dependent acetylation of p53. *Mol. Cell. Biol.*, D. Dorman et al., 2004, 24: 10083–10098.

Inhibition of the Raf–MEK1/2–ERK1/2 signaling pathway, Bcl-xL down-regulation, and chemosensitization of non-Hodgkin's lymphoma B Cells by Rituximab. *Cancer Res.*, A. R. Jazirehi et al., 2004, 64: 7117–7126.

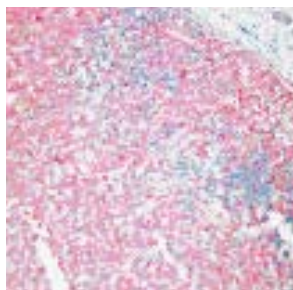
A CBP binding transcriptional repressor produced by the PS1/epsilon-cleavage of N-cadherin is inhibited by PS1 FAD mutations. *Cell*, P. Marambaud et al., 2003, 114: 635–645.

Evidence that sequence homologous region in LRAT-like proteins possesses anti-proliferative activity and DNA binding properties: translational implications and mechanism of action. *Carcinogenesis*, D. P. Simmons et al., 2006, 27(4): 693-707.

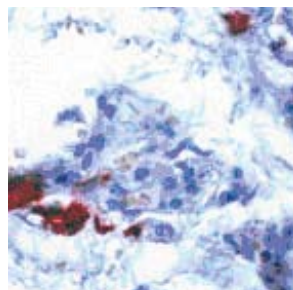
RNA interference-directed knockdown of urokinase plasminogen activator and urokinase plasminogen activator receptor inhibits prostate cancer cell invasion, survival, and tumorigenicity in vivo. *J. Biol. Chem.*, S. M. Pulukuri et al., 2005, 280 (43): 36529-36540.

Antibodies for Cancer Diagnostics and Basic Research

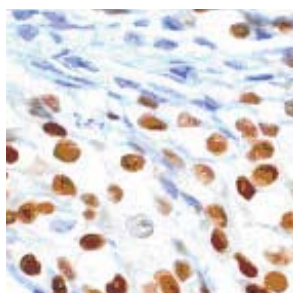
Panomics offers 900 antibodies ideal for use in immunohistochemistry, Western blotting, immunoprecipitation, and immunofluorescence. For a complete list of our available antibodies, please visit our website at www.panomics.com/Antibodies.cfm



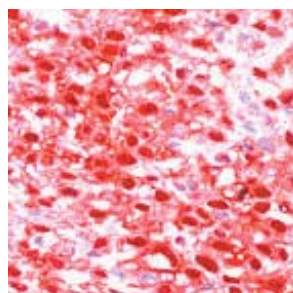
Anaplastic Lymphoma
Stained with Anti-ALK antibody (Cat. # E1094)



Human Thyroid
Stained with Anti-Calcitonin antibody (Cat. # E1151)



Breast Carcinoma
Stained with Anti-ER antibody (Cat. # E1641)



Human Mesothelioma
Stained with Anti-Calretinin antibody (Cat. # E1171)

Elucidate Cell Signaling Pathways and Potential Cross-Talk

■ Identify interactions between your protein of interest and multiple PDZ, SH2, SH3, and WW binding domains

Panomics **Domain Arrays** offer a simple membrane-based system for screening interactions between your protein of interest and over 375 different protein domains. Results from these studies will enable you to elucidate cell signaling pathways and uncover potential cross-talk induced by your protein.

We also offer **Procarta Multiplex Protein Domain Profiling Assays**, which employ fluorescent microsphere-based technology for high-throughput screening of protein-protein interactions.

References:

Bcr (breakpoint cluster region) protein binds to PDZ-domains of scaffold protein PDZK1 and vesicle coat protein Mint3. *J. Cell Sci.*, E. Malmberg et al., 2004, 117: 5535–5541.

Bi-directional regulation between tyrosine kinase Etk/BMX and tumor suppressor p53 in response to DNA damage. *J. Biol. Chem.*, T. Jiang et al., 2004, 279: 50181–50189.

Purification of ATP-binding cassette transporter A1 and associated binding proteins reveals the importance of beta1-syntrophin in cholesterol efflux. *J. Biol. Chem.*, K. Okuhira et al., 2005, 280(47): 39653–39664.

Product	Size	Catalog #
PDZ Domain Array	Kit	MA3020
PDZ Domain Array II	Kit	MA3022
PDZ Domain Array III	Kit	MA3023
PDZ Domain Array IV	Kit	MA3024
SH2 Domain Array	Kit	MA3040
SH3 Domain Array I	Kit	MA3010
SH3 Domain Array II	Kit	MA3011
SH3 Domain Array III	Kit	MA3012
SH3 Domain Array IV	Kit	MA3014
WW Domain Array I	Kit	MA3030
WW Domain Array II	Kit	MA3032

Achieve Effective, Specific Gene Knockdown

We offer an array of shRNA targets for cancer biology research, including CBP, E2F, Jun, GATA 1-3, NFκB, IKK, JAK, p53, and Stats 1–6. For a complete list of all **shRNA Vector Mixes**, please visit our website at <http://www.panomics.com/SR1000.cfm>

References:

Elimination of hepatic metastases of colon cancer cells via p53-independent cross-talk between irinotecan and Apo2 ligand/TRAIL. *Cancer Res.*, R. Ravi et al., 2004, 64(24): 9105–9114.

p21WAF1/CIP1 selectively controls the transcriptional activity of estrogen receptor. *Mol. Cell. Biol.*, A. Fritah et al., 2005, 25: 2419–2430.

7,12-Dimethylbenzanthracene-dependent transcriptional regulation of adenomatous polyposis coli (APC) gene expression in normal breast epithelial cells is mediated by GC-box binding protein Sp3. *Carcinogenesis*, A. S. Jaiswal et al., 2006, 27(2): 252–61.

Product	Size	Catalog #
TF shRNA Vector Mix	Trial (15 µg)	SRxxxx
TF shRNA Vector Mix (includes Ab and Western Detection Kit)	Trial (15 µg)	SRxxxx
TF shRNA Vector Mix	Standard (60 µg)	SRxxxx
TF shRNA Vector Mix (includes Ab and Western Detection Kit)	Standard (60 µg)	SRxxxx



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