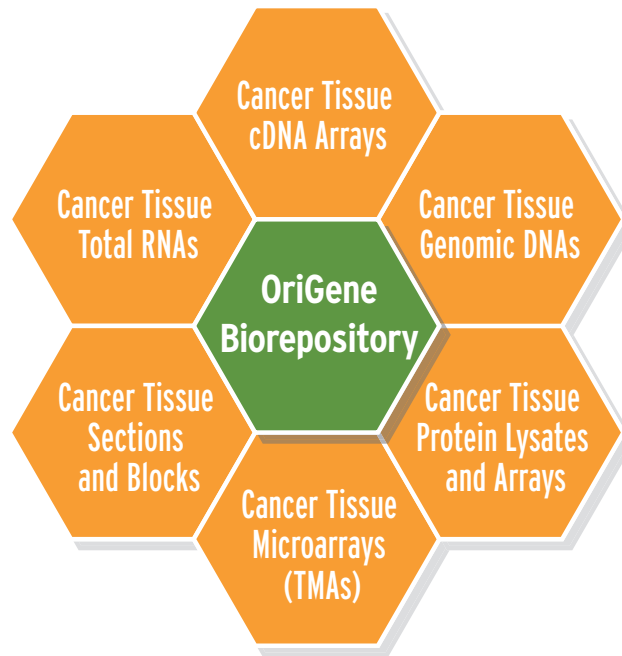


Comprehensive Human Cancer and Normal Tissue Products

Linking genes and proteins to cancer biology



Over 140,000 human tissue collections from major US institutions

Broad coverage of >20 cancer types at different stages

Paired cancer and normal tissue products from same donors

Each sample is pathologist-verified and annotated with clinical data

Application/Assay-ready in individual and array formats

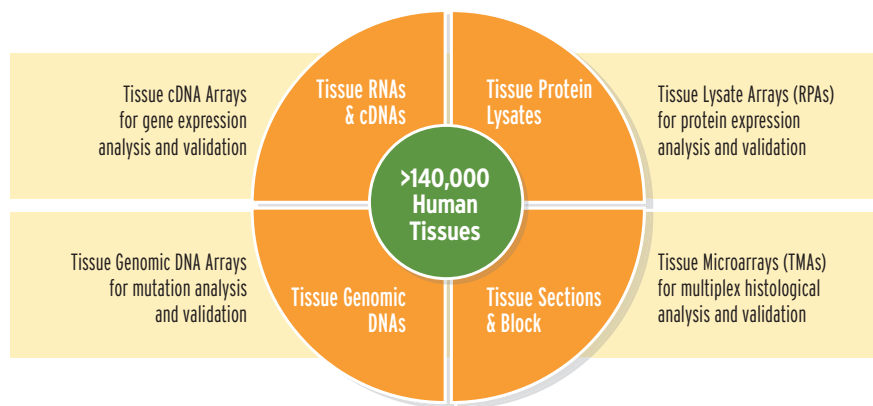
Human Cancer and Normal Tissue Products

Linking genes and proteins to cancer biology

COMPREHENSIVE HUMAN TISSUE PRODUCTS

OriGene has the comprehensive human cancer and normal tissue products developed from its biorepository of over 140,000 human tissues representing over 12,000 donors.

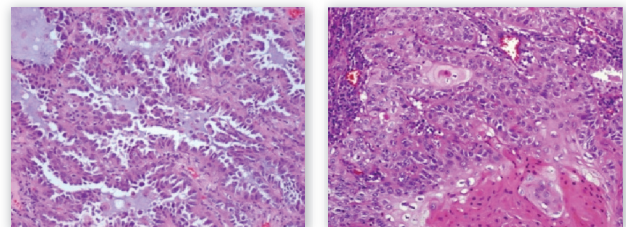
- TissueScan™ Arrays: cDNA arrays, genomic DNA arrays, protein lysate arrays (RPAs), and tissue microarrays (TMAs)
- TissueFocus™ individual products: total RNAs, genomic DNAs, protein lysates, sections, and blocks
- All products are provided in assay/application ready formats



UNPARALLELED QUALITY OF HUMAN TISSUE PRODUCTS

All tissue products are developed from OriGene's high quality tissues, which are banked under strict collection protocols and undergo rigorous quality control to ensure each source block's unparalleled quality.

- Collected from major US institutions under strict IRB and ethical consenting practices
- Maintained in a monitored environment and bar-coded for tracking purposes
- Each tissue source block includes following clinical information
 - Abstracted pathology report
 - Disease staging
 - Digital H&E image
 - Donor's basic demographic information
 - More clinical data available for review through an on-line database

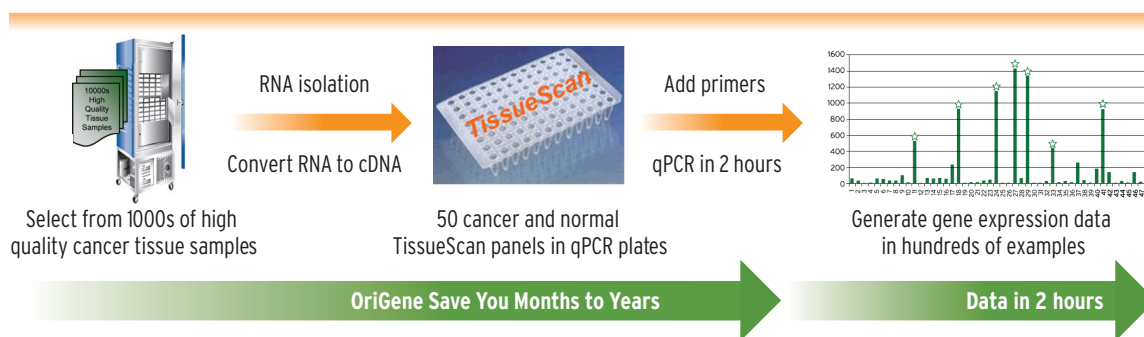


TissueScan™ Cancer Tissue cDNA Arrays

qPCR gene expression results of hundreds of tissues in 2 hours

TissueScan™ Cancer Tissue cDNA Arrays are developed for differential gene expression analysis and validation among hundreds of different tissues. Tissue cDNAs of each array are synthesized from high quality total RNAs of pathologist-verified tissues, normalized and validated with β -actin in two sequential qPCR analyses, and provided with QC data.

- Cancer survey array contains over 20 different cancer types from 381 donors
- Cancer specific arrays cover almost all major cancers
- Normal tissue arrays include major tissues from human, mouse, rat, and Drosophila



qPCR-READY TissueScan™ cDNA ARRAYS FOR IMMEDIATE DELIVERY

	Cancer Survey Panels	Cancer Specific Panels	Normal Panels
Coverage	Adrenal gland, Breast, Cervix, Colon, Endometrium, Esophagus, Gastroesophageal, Kidney, Liver, Lung, Lymphoid, Ovary, Pancreas, Prostate, Stomach, Testis, Thyroid gland, Urinary bladder, Uterus, etc.	Bladder, Brain, Breast, Colon, Crohns, Endometrium, Gastroesophageal, Kidney, Liver, Lung, Lymphoma, Melanoma, Ovarian, Pancreas, Prostate, Sarcoma, Thyroid	Human Normal, Human Brain, Mouse Normal, Mouse Development, Rat Normal, Drosophila
Panels	4	40	6
Format	384- or 96-well	96-well	96-well

KEY PUBLICATIONS

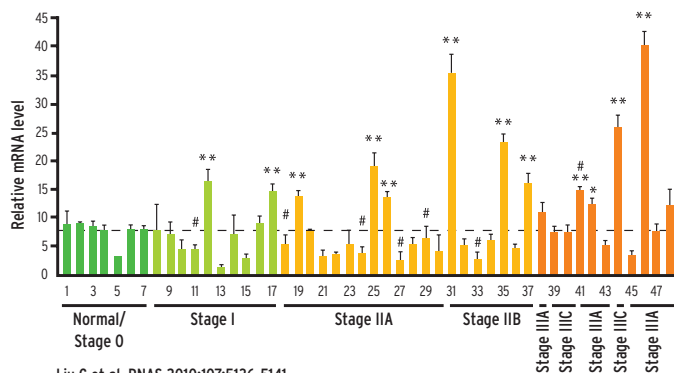
1. Liu Y, et al. (2010). The protein kinase Pak4 disrupts mammary acinar architecture and promotes mammary tumorigenesis. *Oncogene* doi:10.1038/onc.2010.329 **Original Article** [Cancer Survey Panel]
2. Trimmer C, et al. (2010). CAV1 Inhibits Metastatic Potential in Melanomas through Suppression of the Integrin/Src/FAK Signaling Pathway. *Cancer Res.*, 70: 7489 - 7499 [Melanoma Panel]
3. Noor A, et al. (2010). Disruption at the PTCHD1 Locus on Xp22.11 in Autism Spectrum Disorder and Intellectual Disability. *Science Translational Medicine*, 2: 49ra68 [Brain Normal Panel]
4. Beverly LJ and Varmus HE (2009). MYC-induced myeloid leukemogenesis is accelerated by all six members of the antiapoptotic BCL family. *Oncogene* doi: 10.1038/onc.2008.466

TissueScan™ cDNA Arrays For Biomarker Discovery

DISCOVERY OF A NEW CANCER BIOMARKER FOR A NEW SUBTYPE OF BREAST CANCER

Researchers at Washington University School of Medicine discovered a new cancer biomarker that could define a new subtype of breast cancer as well as offer a potential way to treat it and their work was published in the *Proceedings of the National Academy of Sciences*.

- LRP6 expression is frequently up-regulated in a subset of human breast cancer tissues and cell lines
- LRP6 was significantly over-expressed in 20-36% of human breast cancer tissue samples
- LRP6 was increased more frequently in triple (ER, HER2 and PR) negative breast tumor samples

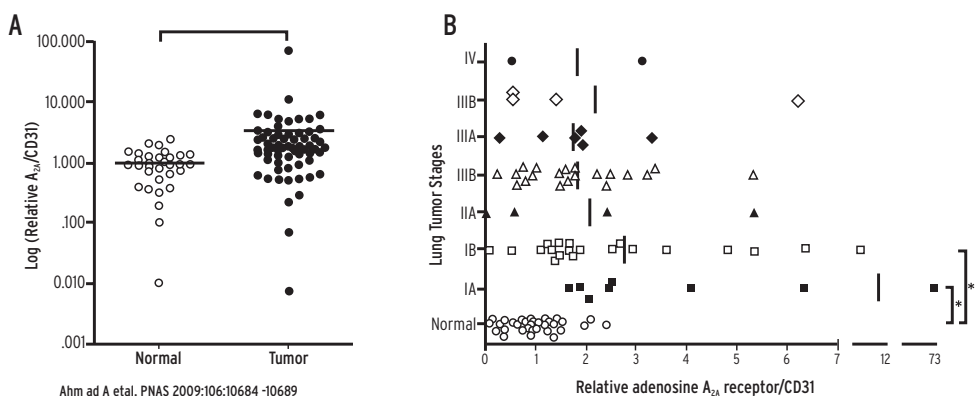


TissueScan™ cDNA Array results clearly indicated LRP6 expression was up-regulated in a subset of human breast cancer tissues. ** P < 0.01.

DISCOVERY OF A NEW PROGNOSIS BIOMARKER FOR LUNG CANCER

Scientists at National Jewish Health have discovered the Adenosine A_{2A} (ADORA2A) receptor as a prognosis and companion diagnostic marker for lung cancer and their work was published in the *Proceedings of the National Academy of Sciences*.

- ADORA2A receptor was significantly over-expressed during the early, stages of tumor growth
- ADORA2A receptor was expressed only in response to HIF-2alpha activation
- A potential new target for an anti-angiogenic approach to treating lung cancer



TissueScan™ cDNA Array results clearly indicated Adenosine A_{2A} receptor expression was increased in lung tumor samples at different stages.

*Statistically different from the normal lung tissue.

Cancer Tissue Protein Lysate Arrays

Large scale, quantitative tools for protein biomarker discovery and validation

Cancer Lysate Arrays are high-density reverse-phase protein arrays (RPPA, or RPA) assembled from 432 cancer and normal tissue protein lysates. With protein-specific antibodies, TissueScan™ Cancer Lysate Arrays enable quantitative identification and validation of protein expression profiles and post-translation modifications among normal tissues and 11 types of cancer in a single experiment.

UTILITIES

- High density array containing triplet of four dilutions of 432 tissue lysates covering 11 types of cancer
- Differential protein expression profiling among normal and different cancers on a single slide
- Protein biomarker and drug target discovery and validation
- Easy to follow protocols for enhanced colorimetric and fluorescence assays
- No special equipment needed and validated detection kits are available for purchase

SIMPLE PROTOCOL

If you can do Western blot, you can do RPPA easily.

Step 1: Primary antibody



Step 2: Secondary antibody



Step 3: Signal amplification (e.g., TSA system)



Step 4: Read and analyze results

Figure 1

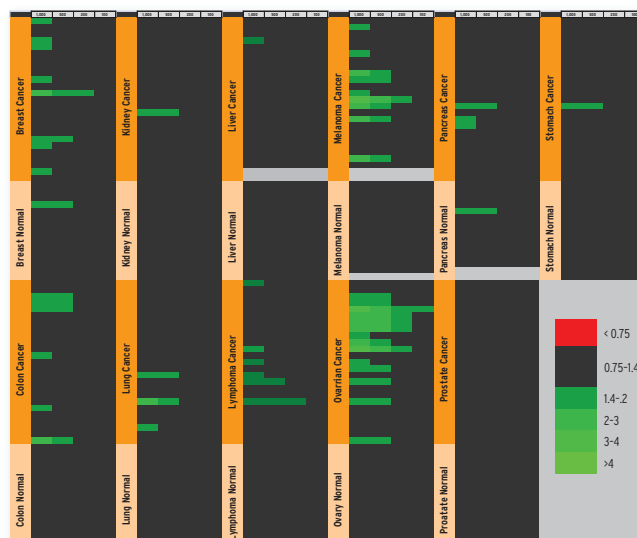
Anti TP53 reactivity with cancer RPPAs tested with colorimetric TSA enhancement protocol.



Figure 2

Simple analysis of cancer differential expression index (sample readout divided by median of the tissue normal samples) for four different proteins presented in heat map format.

Column 1 ERBB2, Column 2 BIRC5, Column 3 TP53, Column 4, Phospho cMyc



TissueFocus™ Tissue Derivative Products

Tissue total RNAs, genomic DNAs, and protein lysates

OriGene's TissueFocus™ tissue total RNA, genomic DNA, and protein lysate samples are produced from our pathologist-verified high quality tissue blocks and undergo rigorous quality control testing to ensure the sample integrity and preservation.

TISSUE TOTAL RNAs AND GENOMIC DNAs

A proprietary set of standard operating procedures is utilized to extract RNA or DNA from tissues to ensure intact total RNA, genomic DNA, free of protein contamination.

- Paired normal and cancer total RNAs and genomic DNAs from same patients
- Over 5,000 searchable tissue RNAs and genomic DNAs available for immediate delivery
- Agilent Bioanalyzer 28S/18S ratio, Electropherogram, A260/A280 ratio and PCR images
- Abstracted pathology report for each sample

SKU	Description	Case ID	Staging	Race/Gender/Age	Price
CR559726	RNA (5 µg); Fallopian tube; Within normal limits	CI0000000001	Not applicable	Black or African American Female, 71	\$ 289
CR559792	RNA (5 µg); Myometrium; Within normal limits	CI0000000001	Not applicable	Female, 71	\$ 289
CR560321	RNA (5 µg); Endometrium; Adenocarcinoma of endometrium, endometrioid, squamous features	CI0000000001	IB	Black or African American Female, 71	\$ 289
CR560345	RNA (5 µg); Ovary; left; Within normal limits	CI0000000001	Not applicable	Female, 71	\$ 289
CR560371	RNA (5 µg); Lung; Carcinoma of lung, sarcomatoid	CI0000000003	IIIB	White or Caucasian Male, 81	\$ 289
CR560384	RNA (5 µg); Lung; left upper lobe; Adenocarcinoma of lung	CI0000000006	IIIA	Female, 70	\$ 289
CR560385	RNA (5 µg); Lung; Within normal limits	CI0000000006	Not applicable	White or Caucasian Female, 70	\$ 289
CD563240	DNA (5 µg); Seminal vesicle; Within normal limits	CI0000000007	Not applicable	Male, 71	\$ 209

TISSUE PROTEIN LYSATES

OriGene's Tissue Protein Lysates are obtained from frozen OCT-embedded tissue samples in the Biorepository. Lysates are routinely generated using a Modified RIPA buffer (no SDS) in the presence of protease and phosphatase inhibitors. Protein quantification is performed using the BCA Protein Assay.

- Paired normal and cancer tissue protein lysates from same patients
- Qualification data provided
 - A PAGE gel image visualized by SYPRO Ruby
 - A Western Blot image using a beta-Actin monoclonal antibody



CUSTOMIZED TissueScan™ cDNA, GENOMIC DNA, AND PROTEIN LYSATE ARRAYS

OriGene has built a state-of-the-art facility to quickly turn our TissueFocus™ derivative products into customized TissueScan™ cDNA, genomic DNA, protein lysate arrays upon request.

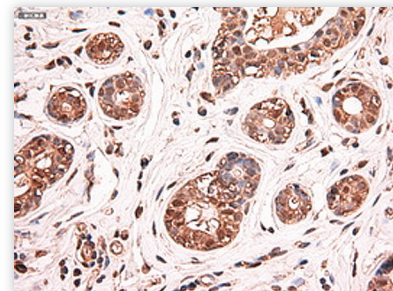


Tissue Sections and Blocks

Quality tissues for your research needs

OriGene's high quality tissues are banked under strict and rigorous collection protocols and are available in either formalin-fixed, paraffin embedded (FFPE) or frozen, OCT-embedded formats.

- >140,000 cancer, normal and other diseased tissues available for immediate delivery
- All sections and blocks include pathology verification data, clinical annotation, abstracted pathology reports and digital H&E images of the source block
- Ideal for immunohistochemistry (IHC), in-situ hybridization (ISH), laser capture microscopy (LCM) and RNA/DNA/Protein extractions

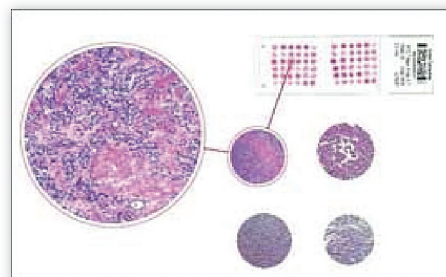


Cancer Tissue Microarray (TMAs)

Quality tissue microarrays for your high-throughput molecular analysis

Tissue microarrays (TMAs) are developed from formalin-fixed paraffin-embedded (FFPE) tissue samples selected from the OriGene's tissue biorepository of over >140,000 tissue samples, which represent hundreds of pathology diagnoses.

- Sample cores selected by board-certified pathologists
- TMA Datasheet/Map includes H&E images and detailed pathology reports
- Fully qualified for IHC analysis and suitable for in situ hybridization (ISH) analysis
- TMA sections freshly-cut prior to shipment



AVAILABLE TMAs FOR IMMEDIATE DELIVERY

Cancer Survey Tissue Microarray: FFPE, 165 x 1 mm cores, 110 tumors and 55 normals, Covering 11 cancer types: Breast, Colon, Lung, Kidney, Ovarian, Endometrial, Stomach, Prostate, Melanoma, Liver, Lymphoma. (5 um section x 1 slide)

Breast Cancer Tissue Microarray: FFPE, 42 x 1 mm cores, 36 tumors and 6 normals. (5 um section x 1 slide)

Ovarian Cancer Tissue Microarray: FFPE, 48 x 1 mm cores, 41 tumors and 7 normals. (5 um section x 1 slide)

OriGene, Your Partner in Gene Research and Beyond

KEY TECHNOLOGIES AND PRODUCTS

- Full-length cDNA clones, ORF clones in expression-ready vectors
- Gene synthesis: any gene, any variant, any vector
- RNAi research reagents: shRNA, siRNA, and miRNA function and detection
- SYBR Green qPCR assays for mRNA and miRNA detection, primer panels
- Recombinant human proteins
- TrueMAB™ monoclonal antibodies
- Luminex multiplex immunoassays
- Cancer tissue biorepository, TMA, RPPA, and TissueScan qPCR arrays



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