

# RT<sup>2</sup> Profiler™ PCR Array: Human Cancer PathwayFinder™

**Catalog Number****For Real-Time Instruments:**

PAHS-033A	ABI Standard Blocks; Bio-Rad iCycler, MyiQ, and (MJ Research) Chromo 4 and Stratagene Mx3005p, Mx3000p
PAHS-033C	ABI 7500 and 7900HT FAST 96-Well Blocks, ABI StepOnePlus
PAHS-033D	Bio-Rad (MJ Research) Opticon and Opticon 2, Stratagene Mx4000
PAHS-033E	ABI 7900HT 384-Well Block
PAHS-033F	Roche LightCycler 480 96-well Block
PAHS-033G	Roche LightCycler 480 384-well Block

**Description**

The Human Cancer PathwayFinder™ RT<sup>2</sup> Profiler PCR Array profiles the expression of 84 genes representative of the six biological pathways involved in transformation and tumorigenesis listed below. You can first determine which of the six pathways is involved in your experimental treatment with this array. Then, you can perform even more focused profiling experiments with one of our other pathway-specific PCR Arrays. Using real-time PCR, you can easily and reliably analyze expression of a focused panel of genes related to oncogenesis with this array.

**Functional Gene Groupings****Cell Cycle Control and DNA Damage Repair:**

ATM, BRCA1, CCNE1 (cyclin E1), CDC25A, CDK2, CDK4, CDKN1A (p21Waf1), CDKN2A (p16Ink4), CHEK2 (chk2 / Rad53), E2F1, MDM2, RB1, S100A4, TP53 (p53).

**Apoptosis and Cell Senescence:**

APAF1, BAD, BAX, BCL2, BCL2L1 (bcl-X), CASP8, CFLAR (CASPER), GZMA, HTATIP2, TERT (telomerase), TNFRSF1A (TNF- $\alpha$  receptor), TNFRSF10B (DR5), TNFRSF25 (DR3).

**Signal Transduction Molecules and Transcription Factors:**

AKT1, ERBB2, ETS2, FOS, JUN, MAP2K1 (MEK), MYC, NFKB1 (NF $\kappa$ B), NFKBIA (I $\kappa$ B $\alpha$ ), PIK3R1 (PI3K p85 $\alpha$ ), RAF1, S100A4, S100A5, S100A6, S100A7, S100A8, S100A9, S100B, S100C, S100D, S100E, S100F, S100G, S100H, S100I, S100J, S100K, S100L, S100M, S100N, S100O, S100P, S100Q, S100R, S100S, S100T, S100U, S100V, S100W, S100X, S100Y, S100Z, S100AA1, S100AA2, S100AA3, S100AA4, S100AA5, S100AA6, S100AA7, S100AA8, S100AA9, S100AA10, S100AA11, S100AA12, S100AA13, S100AA14, S100AA15, S100AA16, S100AA17, S100AA18, S100AA19, S100AA20, S100AA21, S100AA22, S100AA23, S100AA24, S100AA25, S100AA26, S100AA27, S100AA28, S100AA29, S100AA30, S100AA31, S100AA32, S100AA33, S100AA34, S100AA35, S100AA36, S100AA37, S100AA38, S100AA39, S100AA40, S100AA41, S100AA42, S100AA43, S100AA44, S100AA45, S100AA46, S100AA47, S100AA48, S100AA49, S100AA50, S100AA51, S100AA52, S100AA53, S100AA54, S100AA55, S100AA56, S100AA57, S100AA58, S100AA59, S100AA60, S100AA61, S100AA62, S100AA63, S100AA64, S100AA65, S100AA66, S100AA67, S100AA68, S100AA69, S100AA70, S100AA71, S100AA72, S100AA73, S100AA74, S100AA75, S100AA76, S100AA77, S100AA78, S100AA79, S100AA80, S100AA81, S100AA82, S100AA83, S100AA84, S100AA85, S100AA86, S100AA87, S100AA88, S100AA89, S100AA90, S100AA91, S100AA92, S100AA93, S100AA94, S100AA95, S100AA96, S100AA97, S100AA98, S100AA99, S100AA100.

**Adhesion:**

ITGA1 (integrin  $\alpha$ 1), ITGA2 (integrin  $\alpha$ 2), ITGA3 (integrin  $\alpha$ 3), ITGA4 (integrin  $\alpha$ 4), ITGAV (integrin  $\alpha$ V), ITGB1 (integrin  $\beta$ 1), ITGB3 (integrin  $\beta$ 3), ITGB5 (integrin  $\beta$ 5), MCAM, MTSS1, PNN, SYK, UCC1.

**Angiogenesis:**

ANGPT1 (angiopoietin-1), ANGPT2 (angiopoietin-2), COL18A1 (endostatin), FGFR2, IFNA1 (IFN $\alpha$ ), IFNB1 (IFN $\beta$ ), IGF1, IL8, PDGFA, PDGFB, TEK (tie-2), TGF $\beta$ 1, TGFBR1 (ALK-5), THBS1 (thrombospondin-1), TNF, VEGFA.

**Invasion and Metastasis:**

MET, MMP1 (collagenase-1), MMP2 (gelatinase A), MMP9 (gelatinase B), MTA1, MTA2, NME1, NME4, PLAU, PLAUR, S100A4, SERPINB5 (maspin), SERPINE1 (PAI1), TIMP1, TIMP3, TWIST1.

## Product Specification Sheet

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### **Storage Conditions**

Please check the kit components immediately after you receive this package. We are only responsible for missing items reported within two (2) business days of receipt.

**Storage Conditions:** PCR Arrays are shipped at ambient temperature. Keep plates at -20 °C for long-term storage.

**NOTE:** Be sure that you have the correct PCR Array format for your instrument before starting the experiment.

### **References**

1. Hanahan, D. and Weinberg, R.A. (2000) The Hallmarks Of Cancer. *Cell* **100**: 57-70.
2. Tsatsanis, C. and Spandidos, D.A. (2000) The Role Of Oncogenic Kinases In Human Cancer. *Int J Mol Med* **5**: 583-590.
3. Meyer, T. and Hart, I.R. (1998) Mechanisms Of Tumour Metastasis. *Eur J Cancer* **34**: 214-221.
4. Detmar, M. (2000) Tumor Angiogenesis. *JID Symposium Proceedings* **5**: 20-23.
5. Klingelhutz, A.J. (1999) The Roles Of Telomeres And Telomerase In Cellular Immortalization And The Development Of Cancer. *Anticancer Res* **19**: 4823-4830.
6. Kaufmann, S.H. and Gores, G.J. (2000) Apoptosis In Cancer: Cause And Cure. *BioEssays* **22**: 1007-1017.
7. Lowe, S.W. and Lin, A.W. (2000) Apoptosis In Cancer. *Carcinogenesis* **21**: 485-495.
8. Funk, J.O. (1999) Cancer Cell Cycle Control. *Anticancer Res* **19**: 4772-4780.
9. Molinari, M. (2000) Cell Cycle Checkpoints And Their Inactivation In Human Cancer. *Cell Prolif* **33**: 261-274.
10. Clezardin, P. (1998) Recent Insights Into The Role Of Integrins In Cancer Metastasis. *Cell Mol Life Sci* **54**: 541-548.

## Product Specification Sheet

### Array Layout: Human Cancer PathwayFinder™ PCR Array

	1	2	3	4	5	6	7	8	9	10	11	12
A	AKT1	ANGPT1	ANGPT2	APAF1	ATM	BAD	BAX	BCL2	BCL2L1	BRCA1	CASP8	CCNE1
B	CDC25A	CDK2	CDK4	CDKN1A	CDKN2A	CFLAR	CHEK2	COL18A1	E2F1	ERBB2	ETS2	FAS
C	FGFR2	FOS	GZMA	HTATIP2	IFNA1	IFNB1	IGF1	IL8	ITGA1	ITGA2	ITGA3	ITGA4
D	ITGAV	ITGB1	ITGB3	ITGB5	JUN	MAP2K1	MCAM	MDM2	MET	MMP1	MMP2	MMP9
E	MTA1	MTA2	MTSS1	MYC	NFKB1	NFKBIA	NME1	NME4	PDGFA	PDGFB	PIK3R1	PLAU
F	PLAUR	PNN	RAF1	RB1	S100A4	SERPIN5	SERPINE1	SNCG	SYK	TEK	TERT	TGFB1
G	TGFBR1	THBS1	TIMP1	TIMP3	TNF	TNFRSF10B	TNFRSF1A	TNFRSF25	TP53	TWIST1	EPDR1	VEGFA
H	B2M	HPRT1	RPL13A	GAPDH	ACTB	HGDC	RTC	RTC	RTC	PPC	PPC	PPC

### Gene Table

Position	UniGene	GenBank	Symbol	Description
A01	Hs.525622	NM_005163	AKT1	V-akt murine thymoma viral oncogene homolog 1
A02	Hs.369675	NM_001146	ANGPT1	Angiopoietin 1
A03	Hs.553484	NM_001147	ANGPT2	Angiopoietin 2
A04	Hs.552567	NM_001160	APAF1	Apoptotic peptidase activating factor 1
A05	Hs.367437	NM_000051	ATM	Ataxia telangiectasia mutated (includes complementation groups A, C and D)
A06	Hs.370254	NM_004322	BAD	BCL2-antagonist of cell death
A07	Hs.159428	NM_004324	BAX	BCL2-associated X protein
A08	Hs.150749	NM_000633	BCL2	B-cell CLL/lymphoma 2
A09	Hs.516966	NM_138578	BCL2L1	BCL2-like 1
A10	Hs.194143	NM_007294	BRCA1	Breast cancer 1, early onset
A11	Hs.591630	NM_001228	CASP8	Caspase 8, apoptosis-related cysteine peptidase
A12	Hs.244723	NM_001238	CCNE1	Cyclin E1
B01	Hs.437705	NM_001789	CDC25A	Cell division cycle 25 homolog A (S. pombe)
B02	Hs.19192	NM_001798	CDK2	Cyclin-dependent kinase 2
B03	Hs.95577	NM_000075	CDK4	Cyclin-dependent kinase 4
B04	Hs.370771	NM_000389	CDKN1A	Cyclin-dependent kinase inhibitor 1A (p21, Cip1)
B05	Hs.512599	NM_000077	CDKN2A	Cyclin-dependent kinase inhibitor 2A (melanoma, p16, inhibits CDK4)
B06	Hs.390736	NM_003879	CFLAR	CASP8 and FADD-like apoptosis regulator
B07	Hs.291363	NM_007194	CHEK2	CHK2 checkpoint homolog (S. pombe)
B08	Hs.517356	NM_030582	COL18A1	Collagen, type XVIII, alpha 1
B09	Hs.96055	NM_005225	E2F1	E2F transcription factor 1
B10	Hs.446352	NM_004448	ERBB2	V-erb-b2 erythroblastic leukemia viral oncogene homolog 2, neuro/glioblastoma derived
B11	Hs.652288	NM_005239	ETS2	V-Ets erythroblastosis virus E26 oncogene homolog 2 (avian)
B12	Hs.244139	NM_000043	FAS	Fas (TNF receptor superfamily, member 6)
C01	Hs.533683	NM_000141	FGFR2	Fibroblast growth factor receptor 2 (bacteria-expressed kinase, keratinocyte growth factor receptor, craniofacial dysostosis 1, Crouzon syndrome, Pfeiffer syndrome, Jackson-Weiss syndrome)
C02	Hs.25647	NM_005252	FOS	V-fos FBJ murine osteosarcoma viral oncogene homolog
C03	Hs.90708	NM_006144	GZMA	Granzyme A (granzyme 1, cytotoxic T-lymphocyte-associated serine esterase 3)
C04	Hs.90753	NM_006410	HTATIP2	HIV-1 Tat interactive protein 2, 30kDa
C05	Hs.37026	NM_024013	IFNA1	Interferon, alpha 1
C06	Hs.93177	NM_002176	IFNB1	Interferon, beta 1, fibroblast
C07	Hs.160562	NM_000618	IGF1	Insulin-like growth factor 1 (somatomedin C)
C08	Hs.624	NM_000584	IL8	Interleukin 8
C09	Hs.652204	NM_181501	ITGA1	Integrin, alpha 1
C10	Hs.482077	NM_002203	ITGA2	Integrin, alpha 2 (CD49B, alpha 2 subunit of VLA-2 receptor)
C11	Hs.265829	NM_002204	ITGA3	Integrin, alpha 3 (antigen CD49C, alpha 3 subunit of VLA-3 receptor)
C12	Hs.440955	NM_000885	ITGA4	Integrin, alpha 4 (antigen CD49D, alpha 4 subunit of VLA-4 receptor)
D01	Hs.436873	NM_002210	ITGAV	Integrin, alpha V (vitronectin receptor, alpha polypeptide, antigen CD51)
D02	Hs.643813	NM_002211	ITGB1	Integrin, beta 1 (fibronectin receptor, beta polypeptide, antigen CD29 includes MDF2, MSK12)
D03	Hs.218040	NM_000212	ITGB3	Integrin, beta 3 (platelet glycoprotein IIIa, antigen CD61)
D04	Hs.536663	NM_002213	ITGB5	Integrin, beta 5
D05	Hs.525704	NM_002228	JUN	Jun oncogene

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Position	UniGene	GenBank	Symbol	Description
D06	Hs.145442	NM_002755	MAP2K1	Mitogen-activated protein kinase kinase 1
D07	Hs.599039	NM_006500	MCAM	Melanoma cell adhesion molecule
D08	Hs.567303	NM_002392	MDM2	Mdm2, transformed 3T3 cell double minute 2, p53 binding protein (mouse)
D09	Hs.132966	NM_000245	MET	Met proto-oncogene (hepatocyte growth factor receptor)
D10	Hs.83169	NM_002421	MMP1	Matrix metalloproteinase 1 (interstitial collagenase)
D11	Hs.513617	NM_004530	MMP2	Matrix metalloproteinase 2 (gelatinase A, 72kDa gelatinase, 72kDa type IV collagenase)
D12	Hs.297413	NM_004994	MMP9	Matrix metalloproteinase 9 (gelatinase B, 92kDa gelatinase, 92kDa type IV collagenase)
E01	Hs.525629	NM_004689	MTA1	Metastasis associated 1
E02	Hs.173043	NM_004739	MTA2	Metastasis associated 1 family, member 2
E03	Hs.336994	NM_014751	MTSS1	Metastasis suppressor 1
E04	Hs.202453	NM_002467	MYC	V-myc myelocytomatosis viral oncogene homolog (avian)
E05	Hs.431926	NM_003998	NFKB1	Nuclear factor of kappa light polypeptide gene enhancer in B-cells 1 (p105)
E06	Hs.81328	NM_020529	NFKBIA	Nuclear factor of kappa light polypeptide gene enhancer in B-cells inhibitor, alpha
E07	Hs.118638	NM_000269	NME1	Non-metastatic cells 1, protein (NM23A) expressed in
E08	Hs.9235	NM_005009	NME4	Non-metastatic cells 4, protein expressed in
E09	Hs.645488	NM_002607	PDGFA	Platelet-derived growth factor alpha polypeptide
E10	Hs.1976	NM_002608	PDGFB	Platelet-derived growth factor beta polypeptide (simian sarcoma viral (v-sis) oncogene)
E11	Hs.132225	NM_181504	PIK3R1	Phosphoinositide-3-kinase, regulatory subunit 1 (p85 alpha)
E12	Hs.77274	NM_002658	PLAU	Plasminogen activator, urokinase
F01	Hs.466871	NM_002659	PLAUR	Plasminogen activator, urokinase receptor
F02	Hs.409965	NM_002687	PNN	Pinin, desmosome associated protein
F03	Hs.159130	NM_002880	RAF1	V-raf-1 murine leukemia viral oncogene homolog 1
F04	Hs.408528	NM_000321	RB1	Retinoblastoma 1 (including osteosarcoma)
F05	Hs.81256	NM_002961	S100A4	S100 calcium binding protein A4
F06	Hs.55279	NM_002639	SERPINB5	Serpin peptidase inhibitor, clade B (ovalbumin), member 5
F07	Hs.414795	NM_000602	SERPINE1	Serpin peptidase inhibitor, clade E (nexin, plasminogen activator inhibitor type 1), member 1
F08	Hs.349470	NM_003087	SNCG	Synuclein, gamma (breast cancer-specific protein 1)
F09	Hs.371720	NM_003177	SYK	Spleen tyrosine kinase
F10	Hs.89640	NM_000459	TEK	TEK tyrosine kinase, endothelial (venous malformations, multiple cutaneous and mucosal)
F11	Hs.492203	NM_198253	TERT	Telomerase reverse transcriptase
F12	Hs.645227	NM_000660	TGFB1	Transforming growth factor, beta 1
G01	Hs.494622	NM_004612	TGFBRI	Transforming growth factor, beta receptor I (activin A receptor type II-like kinase, 53kDa)
G02	Hs.164226	NM_003246	THBS1	Thrombospondin 1
G03	Hs.522632	NM_003254	TIMP1	TIMP metalloproteinase inhibitor 1
G04	Hs.652397	NM_000362	TIMP3	TIMP metalloproteinase inhibitor 3 (Sorsby fundus dystrophy, pseudoinflammatory)
G05	Hs.241570	NM_000594	TNF	Tumor necrosis factor (TNF superfamily, member 2)
G06	Hs.521456	NM_003842	TNFRSF10B	Tumor necrosis factor receptor superfamily, member 10b
G07	Hs.279594	NM_001065	TNFRSF1A	Tumor necrosis factor receptor superfamily, member 1A
G08	Hs.462529	NM_003790	TNFRSF25	Tumor necrosis factor receptor superfamily, member 25
G09	Hs.408312	NM_000546	TP53	Tumor protein p53 (Li-Fraumeni syndrome)
G10	Hs.66744	NM_000474	TWIST1	Twist homolog 1 (acrocephalosyndactyly 3; Saethre-Chotzen syndrome) (Drosophila)
G11	Hs.563491	NM_017549	EPDR1	Ependymin related protein 1 (zebrafish)
G12	Hs.73793	NM_003376	VEGFA	Vascular endothelial growth factor A
H01	Hs.534255	NM_004048	B2M	Beta-2-microglobulin
H02	Hs.412707	NM_000194	HPRT1	Hypoxanthine phosphoribosyltransferase 1 (Lesch-Nyhan syndrome)
H03	Hs.546356	NM_012423	RPL13A	Ribosomal protein L13a
H04	Hs.544577	NM_002046	GAPDH	Glyceraldehyde-3-phosphate dehydrogenase
H05	Hs.520640	NM_001101	ACTB	Actin, beta
H06	N/A	N/A	HGDC	Human Genomic DNA Contamination
H07	N/A	N/A	RTC	Reverse Transcription Control
H08	N/A	N/A	RTC	Reverse Transcription Control
H09	N/A	N/A	RTC	Reverse Transcription Control
H10	N/A	N/A	PPC	Positive PCR Control
H11	N/A	N/A	PPC	Positive PCR Control
H12	N/A	N/A	PPC	Positive PCR Control