

# RT<sup>2</sup> Profiler™ PCR Array:

## Human G-Protein-Coupled Receptor Signaling PathwayFinder™

**Catalog Number**

PAHS-071A

PAHS-071C

PAHS-071D

PAHS-071E

PAHS-071F

PAHS-071G

**For Real-Time Instruments:**

ABI Standard Blocks; Bio-Rad iCycler, MyiQ, and (MJ Research) Chromo 4; Stratagene Mx3005p and Mx3000p

ABI 7500 and 7900HT FAST 96-Well Blocks, ABI StepOnePlus

Bio-Rad (MJ Research) Opticon and Opticon 2, Stratagene Mx4000

ABI 7900HT 384-Well Block

Roche LightCycler 480 96-well Blocks

Roche LightCycler 480 384-well Blocks

**Description**

The Human G-Protein-Coupled Receptor Signaling PathwayFinder™ RT<sup>2</sup> Profiler™ PCR Array profiles the expression of 84 genes representative of and involved in GPCR-mediated signal transduction pathways. G-protein Coupled Receptors (GPCRs) that are represented on this array include bioactive lipid receptors, metabotropic glutamate receptors (mGluRs), GABA-B-like receptors, rhodopsin-like receptors, and secretin-like receptors. Members of the intricate network of intracellular signaling pathways involved in GPCR-mediated signal transduction are also represented on this array including the cAMP / PKA Pathway, Calcium / PKC Pathway, Calcium / NFAT Pathway, PLC Pathway, Protein Tyrosine Kinase Pathway, PKC / MEK Pathway, p43 / p44MAP Pathway, p38 MAP Pathway, PI-3 Kinase Pathway, NO-cGMP Pathway, Rho Pathway, NFκB Pathway and Jak / Stat Pathway. Using real-time PCR, you can easily and reliably analyze expression of a focused panel of genes related to GPCR-mediated signaling with this array.

**Functional Gene Groupings****G-Protein-Coupled Receptors (GPCRs)**Bioactive Lipid Receptors: EDG1, EDG2, EDG3, EDG4, EDG5.Metabotropic Glutamate, GABA-B-like Receptors: CASR, GRM1, GRM2, GRM4, GRM5, GRM7.Rhodopsin-like Receptors: ADORA2A, ADRB1, ADRB2, AGTR1, AGTR2, AGTRAP, DRD1, DRD2, EDG1, EDG2, EDG3, EDG4, EDG5, GALR2, LHCGR, OPRD1, OPRK1, PTGDR, RHO, TSHR.Secretin-like Receptors: ADORA2A, BAI1, CALCR, CALCRL, CRHR1, CRHR2, GCGR, PTHR1, SCTR.Other G-protein Coupled Receptors: EDN1.**Pathways Related to G-Protein-Coupled Receptor Protein Signaling**Dopamine Receptor Pathway: DRD1, DRD2, OPRD1.G-protein Signaling, Coupled to cAMP Nucleotide Second Messenger (cAMP / PKA): ADCY5, ADORA2A, ADRB1, ADRB2, CALCR, CALCRL, CCL2, COL1A1, CRHR1, CRHR2, CYP19A1, DRD1, EDG1, EDG3, EDN1, GALR2, GCGR, GNAQ, GNAS, GRM2, GRM4, IL1R1, IL1R2, LHCGR, NOS2A, OPRD1, OPRK1, PTGS2, PTHR1, RGS2, TSHR, UCP1, VEGFA.G-protein Signaling, Coupled to IP3 Second Messenger (PLC): AGTR1, CALCR, CASR, EDG2, EDG4, EDN1, GNAQ, GRM5, PIK3CG.Metabotropic Glutamate Receptor Pathway: GRM1, GRM2, GRM4, GRM5, GRM7.Neuropeptide Signaling Pathway: BAI1, OPRD1.Adenosine Receptor Signaling Pathway: ADCY5, ADORA2A.Calcium Signaling Pathway (PKC, NFAT, etc.): CCL2, CCL4, COL1A1, EGR1, ELK1, ELK4, PTGS2.PKC Pathway (Ca<sup>2+</sup>, MEK, etc.): AGTR2, COL1A1, DUSP14, EGR1, FGF2, FOS, IL1R1, IL1R2, JUN, JUNB, MMP9, MYC, NOS2A, PRKCA, PTGS2, RGS2, SERPINE1, SOCS1.

## Product Specification Sheet

Protein Tyrosine Kinase Pathway: ADRB2, AKT1, CCL4, CTGF, PDPK1, PRKCA, RGS2, SOCS1, YWHAZ.

Protein Serine / Threonine Kinase Pathway: AKT1, CDKN1B, PDPK1, PTGDR.

MAPKKK Cascade: ADRB2, AGT, EDG5, FGF2, GRM1, GRM4, PRKCA, TNF, UCP1.

PI-3 Kinase Pathway: AKT1, BCL2, BCL2L1, CCND1, CDKN1B, CFLAR, PDPK1, PIK3CG, PTGS2.

NO-cGMP Pathway: AGTR2, NOS2A, PTGS2, TNF.

Rho Pathway: CDKN1B, CTGF, FOS, IL1B, PTGS2, RHO, SERPINE1.

IκB Kinase / NFκB Cascade: AGT, CFLAR, EDG2, ICAM1, IL1B, IL2, MAX, NOS2A, PTGS2, TNF, VCAM1.

JAK-STAT Cascade: CCL2, CDKN1A, SOCS1.

Other Genes Related to G-Protein-Coupled Receptor Protein Signaling: ARRB1, ARRB2, CCNE1, CCNE2.

### **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. Marinissen MJ, Gutkind JS. G-protein-coupled receptors and signaling networks: emerging paradigms. *Trends Pharmacol Sci* 2001 Jul; **22** (7): 368-76
2. Albert PR, Tiberi M. Receptor signaling and structure: insights from serotonin-1 receptors. *Trends Endocrinol Metab* 2001 Dec; **12** (10): 453-60
3. Liebmann C. Regulation of MAP kinase activity by peptide receptor signalling pathway: paradigms of multiplicity. *Cell Signal* 2001 Nov; **13** (11): 777-85
4. Kranenburg O, Moolenaar WH. Ras-MAP kinase signaling by lysophosphatidic acid and other G protein-coupled receptor agonists. *Oncogene* 2001 Mar 26; **20** (13): 1540-6

## Product Specification Sheet

### Array Layout:

### Human G-Protein-Coupled Receptor Signaling PathwayFinder™ RT<sup>2</sup> Profiler™ PCR Array

	1	2	3	4	5	6	7	8	9	10	11	12
A	ADCY5	ADORA2A	ADRB1	ADRB2	AGT	AGTR1	AGTR2	AGTRAP	AKT1	ARRB1	ARRB2	BAI1
B	BCL2	BCL2L1	CALCR	CALCRL	CASR	CCL2	CCL4	CCND1	CCNE1	CCNE2	CDKN1A	CDKN1B
C	CFLAR	COL1A1	CRHR1	CRHR2	CTGF	CYP19A1	DRD1	DRD2	DUSP14	EDG1	EDG2	EDG3
D	EDG4	EDG5	EDN1	EGR1	ELK1	ELK4	FGF2	FOS	GALR2	GCGR	GNAQ	GNAS
E	GRM1	GRM2	GRM4	GRM5	GRM7	ICAM1	IL1B	IL1R1	IL1R2	IL2	JUN	JUNB
F	LHCGR	MAX	MMP9	MYC	NOS2A	OPRD1	OPRK1	PDPK1	PIK3CG	PRKCA	PTGDR	PTGS2
G	PTH1R1	RGS2	RHO	SCTR	SERPINE1	SOCS1	TNF	TSHR	UCP1	VCAM1	VEGFA	YWHAZ
H	B2M	HPRT1	RPL13A	GAPDH	ACTB	HGDC	RTC	RTC	RTC	PPC	PPC	PPC

### Gene Table

Position	UniGene	GenBank	Symbol	Description
A01	Hs.129493	NM_183357	ADCY5	Adenylate cyclase 5
A02	Hs.197029	NM_000675	ADORA2A	Adenosine A2a receptor
A03	Hs.642658	NM_000684	ADRB1	Adrenergic, beta-1-, receptor
A04	Hs.591251	NM_000024	ADRB2	Adrenergic, beta-2-, receptor, surface
A05	Hs.19383	NM_000029	AGT	Angiotensinogen (serpin peptidase inhibitor, clade A, member 8)
A06	Hs.477887	NM_031850	AGTR1	Angiotensin II receptor, type 1
A07	Hs.405348	NM_000686	AGTR2	Angiotensin II receptor, type 2
A08	Hs.464438	NM_020350	AGTRAP	Angiotensin II receptor-associated protein
A09	Hs.525622	NM_005163	AKT1	V-akt murine thymoma viral oncogene homolog 1
A10	Hs.503284	NM_004041	ARRB1	Arrestin, beta 1
A11	Hs.435811	NM_004313	ARRB2	Arrestin, beta 2
A12	Hs.194654	NM_001702	BAI1	Brain-specific angiogenesis inhibitor 1
B01	Hs.150749	NM_000633	BCL2	B-cell CLL/lymphoma 2
B02	Hs.516966	NM_138578	BCL2L1	BCL2-like 1
B03	Hs.489127	NM_001742	CALCR	CALCITONIN RECEPTOR
B04	Hs.470882	NM_005795	CALCRL	Calcitonin receptor-like
B05	Hs.435615	NM_000388	CASR	Calcium-sensing receptor (hypocalciuric hypercalcemia 1, severe neonatal hyperparathyroidism)
B06	Hs.303649	NM_002982	CCL2	Chemokine (C-C motif) ligand 2
B07	Hs.75703	NM_002984	CCL4	Chemokine (C-C motif) ligand 4
B08	Hs.523852	NM_053056	CCND1	Cyclin D1
B09	Hs.244723	NM_001238	CCNE1	Cyclin E1
B10	Hs.567387	NM_057749	CCNE2	Cyclin E2
B11	Hs.370771	NM_000389	CDKN1A	Cyclin-dependent kinase inhibitor 1A (p21, Cip1)
B12	Hs.238990	NM_004064	CDKN1B	Cyclin-dependent kinase inhibitor 1B (p27, Kip1)
C01	Hs.390736	NM_003879	CFLAR	CASP8 and FADD-like apoptosis regulator
C02	Hs.172928	NM_000088	COL1A1	Collagen, type I, alpha 1
C03	Hs.417628	NM_004382	CRHR1	Corticotropin releasing hormone receptor 1
C04	Hs.546246	NM_001883	CRHR2	Corticotropin releasing hormone receptor 2
C05	Hs.410037	NM_001901	CTGF	Connective tissue growth factor
C06	Hs.511367	NM_000103	CYP19A1	Cytochrome P450, family 19, subfamily A, polypeptide 1
C07	Hs.2624	NM_000794	DRD1	Dopamine receptor D1
C08	Hs.73893	NM_000795	DRD2	Dopamine receptor D2
C09	Hs.91448	NM_007026	DUSP14	Dual specificity phosphatase 14
C10	Hs.154210	NM_001400	EDG1	Endothelial differentiation, sphingolipid G-protein-coupled receptor, 1
C11	Hs.126667	NM_057159	EDG2	Endothelial differentiation, lysophosphatidic acid G-protein-coupled receptor, 2
C12	Hs.585118	NM_005226	EDG3	Endothelial differentiation, sphingolipid G-protein-coupled receptor, 3
D01	Hs.122575	NM_004720	EDG4	Endothelial differentiation, lysophosphatidic acid G-protein-coupled receptor, 4
D02	Hs.458474	NM_004230	EDG5	Endothelial differentiation, sphingolipid G-protein-coupled receptor, 5
D03	Hs.511899	NM_001955	EDN1	Endothelin 1
D04	Hs.326035	NM_001964	EGR1	Early growth response 1
D05	Hs.181128	NM_005229	ELK1	ELK1, member of ETS oncogene family
D06	Hs.497520	NM_001973	ELK4	ELK4, ETS-domain protein (SRF accessory protein 1)
D07	Hs.284244	NM_002006	FGF2	Fibroblast growth factor 2 (basic)
D08	Hs.25647	NM_005252	FOS	V-fos FBJ murine osteosarcoma viral oncogene homolog
D09	Hs.158351	NM_003857	GALR2	GALANIN RECEPTOR 2
D10	Hs.208	NM_000160	GCGR	Glucagon receptor
D11	Hs.269782	NM_002072	GNAQ	Guanine nucleotide binding protein (G protein), q polypeptide
D12	Hs.125898	NM_080425	GNAS	GNAS complex locus
E01	Hs.32945	NM_000838	GRM1	Glutamate receptor, metabotropic 1
E02	Hs.121510	NM_000839	GRM2	Glutamate receptor, metabotropic 2

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Position	UniGene	GenBank	Symbol	Description
E03	Hs.429018	NM_000841	GRM4	Glutamate receptor, metabotropic 4
E04	Hs.147361	NM_000842	GRM5	Glutamate receptor, metabotropic 5
E05	Hs.570608	NM_000844	GRM7	Glutamate receptor, metabotropic 7
E06	Hs.643447	NM_000201	ICAM1	Intercellular adhesion molecule 1 (CD54), human rhinovirus receptor
E07	Hs.126256	NM_000576	IL1B	Interleukin 1, beta
E08	Hs.557403	NM_000877	IL1R1	Interleukin 1 receptor, type I
E09	Hs.25333	NM_004633	IL1R2	Interleukin 1 receptor, type II
E10	Hs.89679	NM_000586	IL2	Interleukin 2
E11	Hs.525704	NM_002228	JUN	Jun oncogene
E12	Hs.25292	NM_002229	JUNB	Jun B proto-oncogene
F01	Hs.468490	NM_000233	LHCGR	Luteinizing hormone/choriogonadotropin receptor
F02	Hs.285354	NM_002382	MAX	MYC associated factor X
F03	Hs.297413	NM_004994	MMP9	Matrix metalloproteinase 9 (gelatinase B, 92kDa gelatinase, 92kDa type IV collagenase)
F04	Hs.202453	NM_002467	MYC	V-myc myelocytomatosis viral oncogene homolog (avian)
F05	Hs.462525	NM_000625	NOS2A	Nitric oxide synthase 2A (inducible, hepatocytes)
F06	Hs.372	NM_000911	OPRD1	Opioid receptor, delta 1
F07	Hs.106795	NM_000912	OPRK1	Opioid receptor, kappa 1
F08	Hs.459691	NM_002613	PDPK1	3-phosphoinositide dependent protein kinase-1
F09	Hs.32942	NM_002649	PIK3CG	Phosphoinositide-3-kinase, catalytic, gamma polypeptide
F10	Hs.531704	NM_002737	PRKCA	Protein kinase C, alpha
F11	Hs.306831	NM_000953	PTGDR	Prostaglandin D2 receptor (DP)
F12	Hs.196384	NM_000963	PTGS2	Prostaglandin-endoperoxide synthase 2 (prostaglandin G/H synthase and cyclooxygenase)
G01	Hs.1019	NM_000316	PTH1R	Parathyroid hormone receptor 1
G02	Hs.78944	NM_002923	RGS2	Regulator of G-protein signalling 2, 24kDa
G03	Hs.247565	NM_000539	RHO	Rhodopsin (opsin 2, rod pigment) (retinitis pigmentosa 4, autosomal dominant)
G04	Hs.42091	NM_002980	SCTR	Secretin receptor
G05	Hs.414795	NM_000602	SERPINE1	Serpin peptidase inhibitor, clade E (nexin, plasminogen activator inhibitor type 1), member 1
G06	Hs.50640	NM_003745	SOCS1	Suppressor of cytokine signaling 1
G07	Hs.241570	NM_000594	TNF	Tumor necrosis factor (TNF superfamily, member 2)
G08	Hs.160411	NM_000369	TSHR	Thyroid stimulating hormone receptor
G09	Hs.249211	NM_021833	UCP1	Uncoupling protein 1 (mitochondrial, proton carrier)
G10	Hs.109225	NM_001078	VCAM1	Vascular cell adhesion molecule 1
G11	Hs.73793	NM_003376	VEGFA	Vascular endothelial growth factor A
G12	Hs.492407	NM_003406	YWHAZ	Tyrosine 3-monooxygenase/tryptophan 5-monooxygenase activation protein, zeta polypeptide
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	SA_00105	HGDC	Human Genomic DNA Contamination
H07	N/A	SA_00104	RTC	Reverse Transcription Control
H08	N/A	SA_00104	RTC	Reverse Transcription Control
H09	N/A	SA_00104	RTC	Reverse Transcription Control
H10	N/A	SA_00103	PPC	Positive PCR Control
H11	N/A	SA_00103	PPC	Positive PCR Control
H12	N/A	SA_00103	PPC	Positive PCR Control