

# RT<sup>2</sup> Profiler™ PCR Array:

## Human Hypoxia Signaling Pathway

**Catalog Number**

PAHS-032A

PAHS-032C

PAHS-032D

PAHS-032E

PAHS-032F

PAHS-032G

**For Real-Time Instruments:**

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

Roche LightCycler 480 384-well Block

**Description**

The Human Hypoxia Signaling Pathway RT<sup>2</sup> Profiler PCR Array profiles the expression of 84 genes involved in hypoxia-related signaling. This array includes genes directly involved in the response to hypoxia and oxidative stress. Genes associated with the hemoglobin complex are represented as well as genes involved in oxidoreductase activity. Transcription factors and genes involved in regulating transcription are included. Genes involved in the physiological and pathophysiological processes affected by hypoxia on the array include those involved in apoptosis, signal transduction, and protein metabolism as well as genes involved in cell growth and metabolism, extracellular matrix and adhesion molecules, and genes involved in cardiac excitation-contraction coupling. Using real-time PCR, you can easily and reliably analyze expression of a focused panel of genes related to the hypoxia signaling pathway with this array.

**Functional Gene Groupings****Response to Stress:**Response to Hypoxia: ANGPTL4, ARNT2, CREBBP, EP300, HIF1A, MT3, PRKAA1.Response to Oxidative Stress: CAT, CYGB, GPX1, PIP3-E.Immune Response: GPI, IL1A, IL6, IL6ST, NOS2A, NOTCH1, PTX3, RARA.Other Genes Related to Stress Response: ADM, EPO, HYOU1, VEGFA.**Hemoglobin Complex Associated Genes:** CYGB, EPO, HBB, HMOX1, NOS2A, PIP3-E.**Oxidoreductase:**Peroxidase: CAT, CYGB, GPX1, PIP3-E.Other Oxidoreductase-Related Genes: HIF1AN, HMOX1, MT3, NOS2A, PLOD3, TH.**Transcription Factors and Regulators:**Transcription Cofactors: CREBBP, DR1, ENO1, EP300, EPAS1, HTATIP, RARA.Transcription Factors: ARNT2, BHLHB2, CREBBP, ENO1, EP300, EPAS1, HIF1A, HIF3A, KHSRP, MYBL2, PPARA, RARA.Other Transcription Factors and Regulators: HIF1AN, NOTCH1.**Apoptosis:**Anti-apoptosis: BAX, ANGPTL4, BIRC5, IL1A, MYBL2, PEA15, PRKAA1, VEGFA.Caspase Activity: BIRC5, CASP1.Induction of Apoptosis: BAX, DAPK3, NUDT2.Other Apoptosis Genes: EP300.**Continued** (next page)

## Product Specification Sheet

**Signal Transduction:** ADM, ARNT2, CASP1, CDC42, CREBBP, EP300, EPAS1, EPO, GNA11, HIF1A, HIF3A, HMOX1, IGFBP1, IL1A, IL6, IL6ST, IQGAP1, KIT, LEP, PLAU, RARA, VEGFA.

**Protein Metabolism:**

Protein Biosynthesis: EEF1A1, PDIA2 (PDIP), PRKAA1, RPL28, RPL32, RPS2, RPS7.

Protein Heterodimerization: ARNT2, HIF1A, RARA, SAE1.

Protein Homodimerization: ARNT2, RARA, VEGFA.

Protein Amino Acid Phosphorylation: DAPK3, KIT, PRKAA1.

Protein Binding: CASP1, CREBBP, ENO1, EP300, IQGAP1, NOS2A, PEA15, PPP2CB, RARA.

Other Genes Related to Protein Metabolism: ARD1A, CDC42, GNA11, HYOU1, MAN2B1, PLOD3, PSMB3, SUMO2, TUBA4A (TUBA1)

**Extracellular Matrix (ECM)-Related Molecules:**

Protease Inhibitors: BIRC5, CSTB.

Protease Molecules: AGTPBP1, CASP1, ECE1, PLAU, PSMB3.

Other Extracellular Molecules: ADM, ANGPTL4, CHGA, COL1A1, EPO, IGF2, IGFBP1, IL1A, IL6, LEP, NPY, PTX3, VEGFA.

**Cytoskeleton:** DCTN2, SPTBN1.

**Cell Growth:**

Cell Cycle: BAX, BIRC5, EP300, HK2, IGF2, IL1A, MYBL2, SSSCA1, VEGFA.

Cell Proliferation: DCTN2, IGF2, IL1A, IL6, MT3, NPY, RARA, VEGFA.

Growth Factors: GPI, IGF2, IGFBP1, IL1A, IL6, KIT, VEGFA.

Other Genes Related to Cell Growth: ENO1.

**Metabolism:**

Carbohydrate Metabolism: GPI, HK2, LCT, MAN2B1, PEA15, PRKAA1, SLC2A1, SLC2A4.

Lipid Metabolism: AGPAT2, ANGPTL4, PPARA, PRKAA1.

One-carbon Compound Metabolism: CA1.

Superoxide Metabolism: MT3, NOS2A.

RNA Metabolism: PRPF40A (FBNP3), KHSRP, RARA, RPL28, RPS2, SNRP70.

Other Genes Related to Metabolism: ADM, AGPAT2, MOCS3, NUDT2, TH, TST, UCP2.

**Cardiac Excitation-Contraction (E-C) Coupling:** ARNT2, CHGA, DAPK3, GNA11, IQGAP1, KIT, NOS2A, NOTCH1, NPY, PRKAA1, SPTBN1.

## 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.

## Product Specification Sheet

### Array Layout: Human Hypoxia Signaling Pathway PCR Array

	1	2	3	4	5	6	7	8	9	10	11	12
A	ADM	AGPAT2	AGTPBP1	ANGPTL4	ARD1A	ARNT2	BAX	BHLHB2	BIRC5	CA1	CASP1	CAT
B	CDC42	CHGA	COL1A1	CREBBP	CSTB	CYGB	DAPK3	DCTN2	DR1	ECE1	EEF1A1	ENO1
C	EP300	EPAS1	EPO	PRPF40A	GNA11	GPI	GPX1	HBB	HIF1A	HIF1AN	HIF3A	HK2
D	HMOX1	HTATIP	HYOU1	IGF2	IGFBP1	IL1A	IL6	IL6ST	IQGAP1	KHSRP	KIT	LCT
E	LEP	MAN2B1	MOCOS3	MT3	MYBL2	NOS2A	NOTCH1	NPY	NUDT2	PDI2	PEA15	PIP3-E
F	PLAU	PLOD3	PPARA	PPP2CB	PRKAA1	PSMB3	PTX3	RARA	RPL28	RPL32	RPS2	RPS7
G	SAE1	SLC2A1	SLC2A4	SNRP70	SPTBN1	SSSCA1	SUMO2	TH	TST	TUBA4A	UCP2	VEGFA
H	B2M	HPRT1	RPL13A	GAPDH	ACTB	HGDC	RTC	RTC	RTC	PPC	PPC	PPC

### Gene Table

Position	UniGene	GenBank	Symbol	Description
A01	Hs.441047	NM_001124	ADM	Adrenomedullin
A02	Hs.320151	NM_006412	AGPAT2	1-acylglycerol-3-phosphate O-acyltransferase 2 (lysophosphatidic acid acyltransferase, beta)
A03	Hs.494321	NM_015239	AGTPBP1	ATP/GTP binding protein 1
A04	Hs.9613	NM_139314	ANGPTL4	Angiotensin-like 4
A05	Hs.433291	NM_003491	ARD1A	ARD1 homolog A, N-acetyltransferase (S. cerevisiae)
A06	Hs.459070	NM_014862	ARNT2	Aryl-hydrocarbon receptor nuclear translocator 2
A07	Hs.159428	NM_004324	BAX	BCL2-associated X protein
A08	Hs.171825	NM_003670	BHLHB2	Basic helix-loop-helix domain containing, class B, 2
A09	Hs.645371	NM_001168	BIRC5	Baculoviral IAP repeat-containing 5 (survivin)
A10	Hs.23118	NM_001738	CA1	Carbonic anhydrase I
A11	Hs.2490	NM_033292	CASP1	Caspase 1, apoptosis-related cysteine peptidase (interleukin 1, beta, convertase)
A12	Hs.502302	NM_001752	CAT	Catalase
B01	Hs.597524	NM_001791	CDC42	Cell division cycle 42 (GTP binding protein, 25kDa)
B02	Hs.150793	NM_001275	CHGA	Chromogranin A (parathyroid secretory protein 1)
B03	Hs.172928	NM_000088	COL1A1	Collagen, type I, alpha 1
B04	Hs.459759	NM_004380	CREBBP	CREB binding protein (Rubinstein-Taybi syndrome)
B05	Hs.695	NM_000100	CSTB	Cystatin B (stefin B)
B06	Hs.95120	NM_134268	CYGB	Cytoglobin
B07	Hs.631844	NM_001348	DAPK3	Death-associated protein kinase 3
B08	Hs.289123	NM_006400	DCTN2	Dynactin 2 (p50)
B09	Hs.348418	NM_001938	DR1	Down-regulator of transcription 1, TBP-binding (negative cofactor 2)
B10	Hs.195080	NM_001397	ECE1	Endothelin converting enzyme 1
B11	Hs.520703	NM_001402	EEF1A1	Eukaryotic translation elongation factor 1 alpha 1
B12	Hs.517145	NM_001428	ENO1	Enolase 1, (alpha)
C01	Hs.517517	NM_001429	EP300	E1A binding protein p300
C02	Hs.468410	NM_001430	EPAS1	Endothelial PAS domain protein 1
C03	Hs.2303	NM_000799	EPO	Erythropoietin
C04	Hs.591637	XM_371575	PRPF40A	PRP40 pre-mRNA processing factor 40 homolog A (S. cerevisiae)
C05	Hs.515056	NM_002067	GNA11	Guanine nucleotide binding protein (G protein), alpha 11 (Gq class)
C06	Hs.466471	NM_000175	GPI	Glucose phosphate isomerase
C07	Hs.76686	NM_000581	GPX1	Glutathione peroxidase 1
C08	Hs.523443	NM_000518	HBB	Hemoglobin, beta
C09	Hs.509554	NM_001530	HIF1A	Hypoxia-inducible factor 1, alpha subunit (basic helix-loop-helix transcription factor)
C10	Hs.500788	NM_017902	HIF1AN	Hypoxia-inducible factor 1, alpha subunit inhibitor
C11	Hs.420830	NM_152794	HIF3A	Hypoxia inducible factor 3, alpha subunit
C12	Hs.406266	NM_000189	HK2	Hexokinase 2
D01	Hs.517581	NM_002133	HMOX1	Heme oxygenase (decycling) 1
D02	Hs.528299	NM_006388	HTATIP	HIV-1 Tat interacting protein, 60kDa
D03	Hs.277704	NM_006389	HYOU1	Hypoxia up-regulated 1
D04	Hs.523414	NM_000612	IGF2	Insulin-like growth factor 2 (somatomedin A)
D05	Hs.642938	NM_000596	IGFBP1	Insulin-like growth factor binding protein 1
D06	Hs.1722	NM_000575	IL1A	Interleukin 1, alpha
D07	Hs.512234	NM_000600	IL6	Interleukin 6 (interferon, beta 2)

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Position	UniGene	GenBank	Symbol	Description
D08	Hs.532082	NM_002184	IL6ST	Interleukin 6 signal transducer (gp130, oncostatin M receptor)
D09	Hs.430551	NM_003870	IQGAP1	IQ motif containing GTPase activating protein 1
D10	Hs.91142	NM_003685	KHSRP	KH-type splicing regulatory protein (FUSE binding protein 2)
D11	Hs.479754	NM_000222	KIT	V-kit Hardy-Zuckerman 4 feline sarcoma viral oncogene homolog
D12	Hs.551506	NM_002299	LCT	Lactase
E01	Hs.194236	NM_000230	LEP	Leptin (obesity homolog, mouse)
E02	Hs.356769	NM_000528	MAN2B1	Mannosidase, alpha, class 2B, member 1
E03	Hs.159410	NM_014484	MOCS3	Molybdenum cofactor synthesis 3
E04	Hs.73133	NM_005954	MT3	Metallothionein 3
E05	Hs.179718	NM_002466	MYBL2	V-myb myeloblastosis viral oncogene homolog (avian)-like 2
E06	Hs.462525	NM_000625	NOS2A	Nitric oxide synthase 2A (inducible, hepatocytes)
E07	Hs.495473	NM_017617	NOTCH1	Notch homolog 1, translocation-associated (Drosophila)
E08	Hs.1832	NM_000905	NPY	Neuropeptide Y
E09	Hs.493767	NM_001161	NUDT2	Nudix (nucleoside diphosphate linked moiety X)-type motif 2
E10	Hs.66581	NM_006849	PDIA2	Protein disulfide isomerase family A, member 2
E11	Hs.517216	NM_003768	PEA15	Phosphoprotein enriched in astrocytes 15
E12	Hs.146100	NM_015553	PIP3-E	Phosphoinositide-binding protein PIP3-E
F01	Hs.77274	NM_002658	PLAU	Plasminogen activator, urokinase
F02	Hs.153357	NM_001084	PLOD3	Procollagen-lysine, 2-oxoglutarate 5-dioxygenase 3
F03	Hs.103110	NM_005036	PPARA	Peroxisome proliferative activated receptor, alpha
F04	Hs.491440	NM_004156	PPP2CB	Protein phosphatase 2 (formerly 2A), catalytic subunit, beta isoform
F05	Hs.43322	NM_006251	PRKAA1	Protein kinase, AMP-activated, alpha 1 catalytic subunit
F06	Hs.82793	NM_002795	PSMB3	Proteasome (prosome, macropain) subunit, beta type, 3
F07	Hs.567326	NM_002852	PTX3	Pentraxin-related gene, rapidly induced by IL-1 beta
F08	Hs.137731	NM_000964	RARA	Retinoic acid receptor, alpha
F09	Hs.652114	NM_000991	RPL28	Ribosomal protein L28
F10	Hs.265174	NM_000994	RPL32	Ribosomal protein L32
F11	Hs.498569	NM_002952	RPS2	Ribosomal protein S2
F12	Hs.546287	NM_001011	RPS7	Ribosomal protein S7
G01	Hs.515500	NM_005500	SAE1	SUMO1 activating enzyme subunit 1
G02	Hs.653218	NM_006516	SLC2A1	Solute carrier family 2 (facilitated glucose transporter), member 1
G03	Hs.380691	NM_001042	SLC2A4	Solute carrier family 2 (facilitated glucose transporter), member 4
G04	Hs.467097	NM_003089	SNRP70	Small nuclear ribonucleoprotein 70kDa polypeptide (RNP antigen)
G05	Hs.503178	NM_003128	SPTBN1	Spectrin, beta, non-erythrocytic 1
G06	Hs.25723	NM_006396	SSSCA1	Sjogren's syndrome/scleroderma autoantigen 1
G07	Hs.380973	NM_006937	SUMO2	SMT3 suppressor of mif two 3 homolog 2 (S. cerevisiae)
G08	Hs.435609	NM_000360	TH	Tyrosine hydroxylase
G09	Hs.474783	NM_003312	TST	Thiosulfate sulfurtransferase (rhodanese)
G10	Hs.75318	NM_006000	TUBA4A	Tubulin, alpha 4a
G11	Hs.80658	NM_003355	UCP2	Uncoupling protein 2 (mitochondrial, proton carrier)
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	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