

# RT<sup>2</sup> Profiler™ PCR Array:

## Human Endothelial Cell Biology

**Catalog Number**

PAHS-015A

PAHS-015C

PAHS-015D

PAHS-015E

PAHS-015F

PAHS-015G

**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 Endothelial Cell Biology RT<sup>2</sup> Profiler PCR Array profiles the expression of 84 genes related to endothelial cell biology. Endothelial cells play a critical role in the progression of disease processes including inflammation, atherosclerosis, and tumor angiogenesis. This array includes genes involved in permissibility and vessel tone, angiogenesis, endothelial cell activation and endothelial cell injury. Using real-time PCR, you can easily and reliably analyze expression of a focused panel of genes related to the atherosclerosis with this array.

**Functional Gene Groupings****Permissibility and Vessel Tone:**Angiotensin System: AGTR1, BLR1.NO System: NOS2A, NOS3.Prostacyclin System: PTGIS.Endothelin System: EDNRA.Oxidoreductase Activity: ALOX5, NOS2A, NOS3, PTGIS, SOD1.Regulation of Blood Pressure: ACE, AGT, EDN1, EDN2, EDNRA, NPPB, NPR1.Regulation of Vascular Permeability: NPPB, NPR1.Vasoconstriction: EDN1, EDN2.**Angiogenesis:**Negative Regulation of Angiogenesis: KLK3, NPPB, NPR1, PF4.Positive Regulation of Angiogenesis: RHOB, SPHK1.Other Genes Involved in Angiogenesis: ANGPT1, ECGF1, FGF1, FLT1, KDR, PGF, VEGFA.**Endothelial Cell Activation:**Adhesion Molecules: CCL2, CCL5, CDH5, COL18A1, CX3CL1, FN1, ICAM1, ITGA5, ITGAV, ITGB1, ITGB3, OCLN, PECAM1, RHOB, SELE, SELPLG, TEK, THBS1, TNF, VCAM1, VWF.Extracellular Matrix (ECM) Molecules: ACE, ADAM17, AGT, CCL2, CCL5, COL18A1, CPB2, CSF2, ECGF1, EDN1, EDN2, FASLG (TNFSF6), FGF1, FLT1, FN1, IL1B, IL3, IL6, IL7, KLK3, MMP1, MMP2, MMP9, NPPB, PLAT, PLAU, SERPINE1, TFPI, THBS1, TIMP1, VWF.Cytokine Activity: CCL5, CSF2, CX3CL1, FASLG (TNFSF6), IFNB1, IL11, IL1B, IL3, IL6, IL7, PF4, TNF, TNFSF10.Thrombin Activity: ANXA5, PLAT, PLAU, PLG, THBD.Vascular Endothelial Growth Factor (VEGFA) Receptor Activity: FLT1, KDR, KIT, PDGFRA, VEGFA.Other Genes Involved in Cell Growth: BAX, BCL2, COL18A1, CSF2, ECGF1, EDN1, EDN2, EDNRA, FGF1, IFNB1, IL11, IL1B, IL3, IL6, IL7, NOS2A, NPPB, PGF, PLG, RHOB, SPHK1, TIMP1, VWF.

## Product Specification Sheet

### **Endothelial Cell Injury:**

Response to Stress: ALOX5, BCL2, CCL2, CCL5, CSF2, CX3CL1, FN1, IFNB1, IL1B, IL6, IL7, ITGB1, NOS2A, PF4, PLA2G4C, SELE, SELPLG, SOD1, TNF, VEGFA, VWF.

Anti-Apoptosis: BAX, BCL2, BCL2A1, BCL2L1, CCL2, CFLAR, FAS (TNFRSF6), FASLG (TNFSF6), SPHK1, TNF, TNFAIP3.

Caspase Activation: CASP1, CASP3, CASP6, CFLAR, IFNB1.

Induction of Apoptosis: BAX, CASP3, CASP6, CFLAR, CRADD, FAS (TNFRSF6), FASLG (TNFSF6), TNFSF10.

Other Genes Related to Apoptosis: IL1B, RHOB, RIPK1, TNFRSF10C, VEGFA.

### **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. Leeder JS. (2001) Pharmacogenetics and Pharmacogenomics. *Pediatr Clin North Am.* **48:** 765-81.
2. Gram TE, Okine LK, Gram RA (1986). The Metabolism of Xenobiotics By Certain Extrahepatic Organs And Its Relation To Toxicity. *Annu Rev Pharmacol Toxicol.* **26:**259-91.
3. Anders MW, editor (1985). *Bioactivation Of Foreign Compounds.* New York Academic.
4. Brodie BB, Axelrod J, Cooper JR, et al (1955). Detoxication Of Drugs And Other Foreign Compounds By Liver Microsomes. *Science* **121:** 603-604.
5. Nelson DR, Koymans L, Kamataki T, et al (1996). P450 Superfamily: Update On New Sequences, Gene Mapping, Accession Numbers And Nomenclature. *Pharmacogenetics* **6:**1-42.
6. Gonzalez FJ, Nebert DW (1990). Evolution Of The P450 Gene Superfamily: Animal-Plant "Warfare", Molecular Drive And Human Genetic Differences In Drug Oxidation. *Trends Genet* **6:** 182-186.
7. Parkinson A (1996) An Overview Of Current Cytochrome P450 Technology For Assessing The Safety And Efficacy Of New Materials. *Toxicol Pathol* **24:** 45-57.
8. Schwab M, Klotz U. (2001). Pharmacokinetic Considerations In The Treatment Of Inflammatory Bowel Disease. *Clin Pharmacokinet.* **40:** 723-51.
9. Silverman JA. Related Articles (1999) Multidrug-Resistance Transporters. *Pharm Biotechnol.* **12:** 353-86.
10. Weinshilboum R. (1989) Methyltransferase Pharmacogenetics. *Pharmacol Ther* **43:** 77-90.
11. Kaufmann FC, editor (1994). *Conjugation-deconjugation in drug metabolism Sulfotransferase enzymes handbook of experimental pharmacology, Vol 112.*
12. Falany CN (1997) Enzymology of Human Cytosolic Sulfotransferase *FASEB J* **11:** 206-216.
13. Daujat M, Pichard L, Fabre I, et al (1991) Induction Protocols For Cytochrome P450 IIIA *in vivo* and in Primary Cultures of Animal and Human Hepatocytes. *Methods Enzymol* **206:** 345-353.
14. King CD, Rios GR, Green MD, Tephly TR. (2000) UDP-Glucuronosyltransferases. *Curr Drug Metab.* **1:** 143-61.
15. Fretland AJ, Omiecinski CJ (2000). Epoxide Hydrolases: Biochemistry And Molecular Biology. *Chem Biol Interact.* **129:** 41-59.

## Product Specification Sheet

### Array Layout: Human Endothelial Cell Biology PCR Array

	1	2	3	4	5	6	7	8	9	10	11	12
A	ACE	ADAM17	AGT	AGTR1	ALOX5	ANGPT1	ANXA5	BAX	BCL2	BCL2A1	BCL2L1	BLR1
B	CASP1	CASP3	CASP6	CCL2	CCL5	CDH5	CFLAR	COL18A1	CPB2	CRADD	CSF2	CX3CL1
C	ECGF1	EDN1	EDN2	EDNRA	FAS	FASLG	FGF1	FLT1	FN1	ICAM1	IFNB1	IL11
D	IL1B	IL3	IL6	IL7	ITGA5	ITGAV	ITGB1	ITGB3	KDR	KIT	KLK3	MMP1
E	MMP2	MMP9	NOS2A	NOS3	NPPB	NPR1	OCLN	PDGFRA	PECAM1	PF4	PGF	PLA2G4C
F	PLAT	PLAU	PLG	PTGIS	RHOB	RIPK1	SELE	SELL	SELPLG	SERPINE1	SOD1	SPHK1
G	TEK	TFPI	THBD	THBS1	TIMP1	TNF	TNFAIP3	TNFRSF10C	TNFSF10	VCAM1	VEGFA	VWF
H	B2M	HPRT1	RPL13A	GAPDH	ACTB	HGDC	RTC	RTC	RTC	PPC	PPC	PPC

### Gene Table

Position	UniGene	GenBank	Symbol	Description
A01	Hs.298469	NM_152831	ACE	Angiotensin I converting enzyme (peptidyl-dipeptidase A) 1
A02	Hs.404914	NM_003183	ADAM17	ADAM metalloproteinase domain 17 (tumor necrosis factor, alpha, converting enzyme)
A03	Hs.19383	NM_000029	AGT	Angiotensinogen (serpin peptidase inhibitor, clade A, member 8)
A04	Hs.477887	NM_031850	AGTR1	Angiotensin II receptor, type 1
A05	Hs.89499	NM_000698	ALOX5	Arachidonate 5-lipoxygenase
A06	Hs.369675	NM_001146	ANGPT1	Angiopietin 1
A07	Hs.480653	NM_001154	ANXA5	Annexin A5
A08	Hs.159428	NM_004324	BAX	BCL2-associated X protein
A09	Hs.150749	NM_000633	BCL2	B-cell CLL/lymphoma 2
A10	Hs.227817	NM_004049	BCL2A1	BCL2-related protein A1
A11	Hs.516966	NM_138578	BCL2L1	BCL2-like 1
A12	Hs.113916	NM_001716	BLR1	Burkitt lymphoma receptor 1, GTP binding protein (chemokine (C-X-C motif) receptor 5)
B01	Hs.2490	NM_033292	CASP1	Caspase 1, apoptosis-related cysteine peptidase (interleukin 1, beta, convertase)
B02	Hs.141125	NM_004346	CASP3	Caspase 3, apoptosis-related cysteine peptidase
B03	Hs.389452	NM_032992	CASP6	Caspase 6, apoptosis-related cysteine peptidase
B04	Hs.303649	NM_002982	CCL2	Chemokine (C-C motif) ligand 2
B05	Hs.514821	NM_002985	CCL5	Chemokine (C-C motif) ligand 5
B06	Hs.76206	NM_001795	CDH5	Cadherin 5, type 2, VE-cadherin (vascular epithelium)
B07	Hs.390736	NM_003879	CFLAR	CASP8 and FADD-like apoptosis regulator
B08	Hs.517356	NM_030582	COL18A1	Collagen, type XVIII, alpha 1
B09	Hs.512937	NM_001872	CPB2	Carboxypeptidase B2 (plasma)
B10	Hs.38533	NM_003805	CRADD	CASP2 and RIPK1 domain containing adaptor with death domain
B11	Hs.1349	NM_000758	CSF2	Colony stimulating factor 2 (granulocyte-macrophage)
B12	Hs.531668	NM_002996	CX3CL1	Chemokine (C-X3-C motif) ligand 1
C01	Hs.592212	NM_001953	ECGF1	Endothelial cell growth factor 1 (platelet-derived)
C02	Hs.511899	NM_001955	EDN1	Endothelin 1
C03	Hs.1407	NM_001956	EDN2	Endothelin 2
C04	Hs.183713	NM_001957	EDNRA	Endothelin receptor type A
C05	Hs.244139	NM_000043	FAS	Fas (TNF receptor superfamily, member 6)
C06	Hs.2007	NM_000639	FASLG	Fas ligand (TNF superfamily, member 6)
C07	Hs.483635	NM_000800	FGF1	Fibroblast growth factor 1 (acidic)
C08	Hs.507621	NM_002019	FLT1	Fms-related tyrosine kinase 1 (vascular endothelial growth factor/vascular permeability factor receptor)
C09	Hs.203717	NM_002026	FN1	Fibronectin 1
C10	Hs.643447	NM_000201	ICAM1	Intercellular adhesion molecule 1 (CD54), human rhinovirus receptor
C11	Hs.93177	NM_002176	IFNB1	Interferon, beta 1, fibroblast
C12	Hs.467304	NM_000641	IL11	Interleukin 11
D01	Hs.126256	NM_000576	IL1B	Interleukin 1, beta
D02	Hs.694	NM_000588	IL3	Interleukin 3 (colony-stimulating factor, multiple)
D03	Hs.512234	NM_000600	IL6	Interleukin 6 (interferon, beta 2)
D04	Hs.591873	NM_000880	IL7	Interleukin 7
D05	Hs.505654	NM_002205	ITGA5	Integrin, alpha 5 (fibronectin receptor, alpha polypeptide)

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Position	UniGene	GenBank	Symbol	Description
D06	Hs.436873	NM_002210	ITGAV	Integrin, alpha V (vitronectin receptor, alpha polypeptide, antigen CD51)
D07	Hs.643813	NM_002211	ITGB1	Integrin, beta 1 (fibronectin receptor, beta polypeptide, antigen CD29 includes MDF2, MSK12)
D08	Hs.218040	NM_000212	ITGB3	Integrin, beta 3 (platelet glycoprotein IIIa, antigen CD61)
D09	Hs.479756	NM_002253	KDR	Kinase insert domain receptor (a type III receptor tyrosine kinase)
D10	Hs.479754	NM_000222	KIT	V-kit Hardy-Zuckerman 4 feline sarcoma viral oncogene homolog
D11	Hs.171995	NM_001648	KLK3	Kallikrein-related peptidase 3
D12	Hs.83169	NM_002421	MMP1	Matrix metalloproteinase 1 (interstitial collagenase)
E01	Hs.513617	NM_004530	MMP2	Matrix metalloproteinase 2 (gelatinase A, 72kDa gelatinase, 72kDa type IV collagenase)
E02	Hs.297413	NM_004994	MMP9	Matrix metalloproteinase 9 (gelatinase B, 92kDa gelatinase, 92kDa type IV collagenase)
E03	Hs.462525	NM_000625	NOS2A	Nitric oxide synthase 2A (inducible, hepatocytes)
E04	Hs.653170	NM_000603	NOS3	Nitric oxide synthase 3 (endothelial cell)
E05	Hs.219140	NM_002521	NPPB	Natriuretic peptide precursor B
E06	Hs.490330	NM_000906	NPR1	Natriuretic peptide receptor A/guanylate cyclase A (atriuretic peptide receptor A)
E07	Hs.592605	NM_002538	OCLN	Occludin
E08	Hs.74615	NM_006206	PDGFRA	Platelet-derived growth factor receptor, alpha polypeptide
E09	Hs.514412	NM_000442	PECAM1	Platelet/endothelial cell adhesion molecule (CD31 antigen)
E10	Hs.81564	NM_002619	PF4	Platelet factor 4 (chemokine (C-X-C motif) ligand 4)
E11	Hs.252820	NM_002632	PGF	Placental growth factor, vascular endothelial growth factor-related protein
E12	Hs.631562	NM_003706	PLA2G4C	Phospholipase A2, group IVC (cytosolic, calcium-independent)
F01	Hs.491582	NM_000930	PLAT	Plasminogen activator, tissue
F02	Hs.77274	NM_002658	PLAU	Plasminogen activator, urokinase
F03	Hs.143436	NM_000301	PLG	Plasminogen
F04	Hs.302085	NM_000961	PTGIS	Prostaglandin I2 (prostacyclin) synthase
F05	Hs.502876	NM_004040	RHOB	Ras homolog gene family, member B
F06	Hs.519842	NM_003804	RIPK1	Receptor (TNFRSF)-interacting serine-threonine kinase 1
F07	Hs.89546	NM_000450	SELE	Selectin E (endothelial adhesion molecule 1)
F08	Hs.82848	NM_000655	SELL	Selectin L (lymphocyte adhesion molecule 1)
F09	Hs.591014	NM_003006	SELPLG	Selectin P ligand
F10	Hs.414795	NM_000602	SERPINE1	Serpin peptidase inhibitor, clade E (nexin, plasminogen activator inhibitor type 1), member 1
F11	Hs.443914	NM_000454	SOD1	Superoxide dismutase 1, soluble (amyotrophic lateral sclerosis 1 (adult))
F12	Hs.68061	NM_021972	SPHK1	Sphingosine kinase 1
G01	Hs.89640	NM_000459	TEK	TEK tyrosine kinase, endothelial (venous malformations, multiple cutaneous and mucosal)
G02	Hs.516578	NM_006287	TFPI	Tissue factor pathway inhibitor (lipoprotein-associated coagulation inhibitor)
G03	Hs.2030	NM_000361	THBD	Thrombomodulin
G04	Hs.164226	NM_003246	THBS1	Thrombospondin 1
G05	Hs.522632	NM_003254	TIMP1	TIMP metalloproteinase inhibitor 1
G06	Hs.241570	NM_000594	TNF	Tumor necrosis factor (TNF superfamily, member 2)
G07	Hs.211600	NM_006290	TNFAIP3	Tumor necrosis factor, alpha-induced protein 3
G08	Hs.655801	NM_003841	TNFRSF10C	Tumor necrosis factor receptor superfamily, member 10c, decoy without an intracellular domain
G09	Hs.478275	NM_003810	TNFSF10	Tumor necrosis factor (ligand) superfamily, member 10
G10	Hs.109225	NM_001078	VCAM1	Vascular cell adhesion molecule 1
G11	Hs.73793	NM_003376	VEGFA	Vascular endothelial growth factor A
G12	Hs.440848	NM_000552	VWF	Von Willebrand factor
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