

# RT<sup>2</sup> Profiler PCR Array (96-Well Format and 384-Well [4 x 96] Format)

## Human Insulin Resistance

Cat. no. 330231 PAHS-156ZA

For pathway expression analysis

Format	For use with the following real-time cyclers
RT <sup>2</sup> Profiler PCR Array, Format A	Applied Biosystems® models 5700, 7000, 7300, 7500, 7700, 7900HT, ViiA™ 7 (96-well block); Bio-Rad® models iCycler®, iQ™ 5, MyiQ™, MyiQ2; Bio-Rad/MJ Research Chromo4™; Eppendorf® Mastercycler® ep realplex models 2, 2s, 4, 4s; Stratagene® models Mx3005P®, Mx3000P®; Takara TP-800
RT <sup>2</sup> Profiler PCR Array, Format C	Applied Biosystems models 7500 (Fast block), 7900HT (Fast block), StepOnePlus™, ViiA 7 (Fast block)
RT <sup>2</sup> Profiler PCR Array, Format D	Bio-Rad CFX96™; Bio-Rad/MJ Research models DNA Engine Opticon®, DNA Engine Opticon 2; Stratagene Mx4000®
RT <sup>2</sup> Profiler PCR Array, Format E	Applied Biosystems models 7900HT (384-well block), ViiA 7 (384-well block); Bio-Rad CFX384™
RT <sup>2</sup> Profiler PCR Array, Format F	Roche® LightCycler® 480 (96-well block)
RT <sup>2</sup> Profiler PCR Array, Format G	Roche LightCycler 480 (384-well block)
RT <sup>2</sup> Profiler PCR Array, Format H	Fluidigm® BioMark™



Sample & Assay Technologies

## Description

The Human Insulin Resistance RT<sup>2</sup> Profiler PCR Array profiles the expression of 84 key genes involved in the mechanisms behind non-insulin dependent diabetes mellitus (NIDDM) in adipose tissue. During food consumption, insulin release activates insulin signaling and cellular uptake of glucose, resulting in synthesis and storage of carbohydrates and lipids. Resistance to insulin can develop late in life, especially after a prolonged high-calorie diet and in association with other risk factors. Insulin-resistant individuals are vulnerable to multiple pathophysiologies as a result of residual blood glucose, including development of NIDDM, or type 2 diabetes. NIDDM is frequently accompanied by obesity and additional related pathologies (i.e., cardiovascular disease), collectively called the metabolic syndrome. Insulin resistance is a key link between obesity and NIDDM, and may be caused by dysregulation of the complex signaling between adipose tissue, pancreatic islets, liver, and skeletal muscle. Adipose tissue modulates food intake, as well as carbohydrate and lipid metabolism, through release of hormones called adipokines. In addition, activation of the innate immune system has been linked to adipose tissue inflammation and the development of insulin resistance via the NLRP3 inflammasome. This tissue is chronically inflamed during obesity, marked by an increase of inflammatory cytokines and infiltrating leukocytes. This array includes adipose genes involved in insulin and adipokine signaling, genes commonly dysregulated in NIDDM, genes involved in innate immunity and inflammatory processes, and enzymes and transporters important for carbohydrate and lipid metabolism. The results of this array can yield insights into the dysregulated mechanisms of insulin resistance using adipose tissue as a model system. Using real-time PCR, research studies can easily and reliably analyze the expression of a focused panel of genes involved in adipose tissue insulin resistance mechanisms with this array.

For further details, consult the *RT<sup>2</sup> Profiler PCR Array Handbook*.

## Shipping and storage

RT<sup>2</sup> Profiler PCR Arrays in formats A, C, D, E, F, and G are shipped at ambient temperature, on dry ice, or blue ice packs depending on destination and accompanying products. RT<sup>2</sup> Profiler PCR Arrays in format H are shipped on dry ice or blue ice packs.

For long term storage, keep plates at –20°C.

**Note:** Ensure that you have the correct RT<sup>2</sup> Profiler PCR Array format for your real-time cycler (see table above).

**Note:** Open the package and store the products appropriately immediately on receipt.

---

## Array layout (96-well)

For 384-well 4 x 96 PCR arrays, genes are present in a staggered format. Refer to the *RT<sup>2</sup> Profiler PCR Array Handbook* for layout.

	1	2	3	4	5	6	7	8	9	10	11	12
A	ACACA	ACACB	ACSL1	ACSL4	ADIPOQ	ADIPOR1	ADIPOR2	AKT3	ALOX5	APOE	CASP1	CCL2
B	CCR4	CCR5	CCR6	CD36	CD3E	CEBPA	CHUK	CNBP	CRLF2	CS	CXCR3	CXCR4
C	EMR1	FABP4	FASN	HK2	IFNG	IGF1	IGF1R	IKKBK	IL18R1	IL1B	IL1R1	IL23R
D	IL6	IL8	INSR	IRS1	IRS2	JAK2	LEP	LEPR	LIPE	LPL	LTA4H	MAP2K1
E	MAPK3	MAPK9	MTOR	NAMPT	NFKBIA	NLRP3	OLR1	PCK1	PDE3B	PDK2	PDX1	PIK3CA
F	PIK3R1	PPARA	PPARG	PPARGC1A	PTPN1	PYCARD	RBP4	RELA	RETN	RP56KB1	SCD	SERPINE1
G	SLC27A1	SLC2A4	SOC3	SREBF1	SREBF2	STAT3	TLR4	TNF	TNFRSF1A	TNFRSF1B	UCP1	VLDLR
H	ACTB	B2M	GAPDH	HPRT1	RPLP0	HGDC	RTC	RTC	RTC	PPC	PPC	PPC

## Gene table: RT<sup>2</sup> Profiler PCR Array

Position	UniGene	GenBank	Symbol	Description
A01	Hs.160556	NM_198834	ACACA	Acetyl-CoA carboxylase alpha
A02	Hs.234898	NM_001093	ACACB	Acetyl-CoA carboxylase beta
A03	Hs.406678	NM_001995	ACSL1	Acyl-CoA synthetase long-chain family member 1
A04	Hs.268785	NM_004458	ACSL4	Acyl-CoA synthetase long-chain family member 4
A05	Hs.80485	NM_004797	ADIPOQ	Adiponectin, C1Q and collagen domain containing
A06	Hs.5298	NM_015999	ADIPOR1	Adiponectin receptor 1
A07	Hs.371642	NM_024551	ADIPOR2	Adiponectin receptor 2
A08	Hs.498292	NM_005465	AKT3	V-akt murine thymoma viral oncogene homolog 3 (protein kinase B, gamma)
A09	Hs.89499	NM_000698	ALOX5	Arachidonate 5-lipoxygenase
A10	Hs.654439	NM_000041	APOE	Apolipoprotein E
A11	Hs.2490	NM_033292	CASP1	Caspase 1, apoptosis-related cysteine peptidase (interleukin 1, beta, convertase)
A12	Hs.303649	NM_002982	CCL2	Chemokine (C-C motif) ligand 2
B01	Hs.184926	NM_005508	CCR4	Chemokine (C-C motif) receptor 4
B02	Hs.450802	NM_000579	CCR5	Chemokine (C-C motif) receptor 5
B03	Hs.46468	NM_004367	CCR6	Chemokine (C-C motif) receptor 6
B04	Hs.120949	NM_000072	CD36	CD36 molecule (thrombospondin receptor)
B05	Hs.3003	NM_000733	CD3E	CD3e molecule, epsilon (CD3-TCR complex)
B06	Hs.699463	NM_004364	CEBPA	CCAAT/enhancer binding protein (C/EBP), alpha
B07	Hs.198998	NM_001278	CHUK	Conserved helix-loop-helix ubiquitous kinase
B08	Hs.518249	NM_003418	CNBP	CCHC-type zinc finger, nucleic acid binding protein
B09	Hs.287729	NM_001012288	CRLF2	Cytokine receptor-like factor 2
B10	Hs.430606	NM_004077	CS	Citrate synthase
B11	Hs.198252	NM_001504	CXCR3	Chemokine (C-X-C motif) receptor 3
B12	Hs.593413	NM_003467	CXCR4	Chemokine (C-X-C motif) receptor 4
C01	Hs.2375	NM_001974	EMR1	Egf-like module containing, mucin-like, hormone receptor-like 1
C02	Hs.391561	NM_001442	FABP4	Fatty acid binding protein 4, adipocyte
C03	Hs.83190	NM_004104	FASN	Fatty acid synthase
C04	Hs.406266	NM_000189	HK2	Hexokinase 2
C05	Hs.856	NM_000619	IFNG	Interferon, gamma
C06	Hs.160562	NM_000618	IGF1	Insulin-like growth factor 1 (somatomedin C)
C07	Hs.643120	NM_000875	IGF1R	Insulin-like growth factor 1 receptor
C08	Hs.597664	NM_001556	IKKBK	Inhibitor of kappa light polypeptide gene enhancer in B-cells, kinase beta
C09	Hs.469521	NM_003855	IL18R1	Interleukin 18 receptor 1
C10	Hs.126256	NM_000576	IL1B	Interleukin 1, beta
C11	Hs.701982	NM_000877	IL1R1	Interleukin 1 receptor, type I
C12	Hs.677426	NM_144701	IL23R	Interleukin 23 receptor
D01	Hs.654458	NM_000600	IL6	Interleukin 6 (interferon, beta 2)
D02	Hs.624	NM_000584	IL8	Interleukin 8
D03	Hs.465744	NM_000208	INSR	Insulin receptor
D04	Hs.471508	NM_005544	IRS1	Insulin receptor substrate 1
D05	Hs.442344	NM_003749	IRS2	Insulin receptor substrate 2
D06	Hs.656213	NM_004972	JAK2	Janus kinase 2
D07	Hs.194236	NM_000230	LEP	Leptin
D08	Hs.705413	NM_002303	LEPR	Leptin receptor
D09	Hs.656980	NM_005357	LIPE	Lipase, hormone-sensitive

Position	UniGene	GenBank	Symbol	Description
D10	Hs.180878	NM_000237	LPL	Lipoprotein lipase
D11	Hs.524648	NM_000895	LTA4H	Leukotriene A4 hydrolase
D12	Hs.145442	NM_002755	MAP2K1	Mitogen-activated protein kinase kinase 1
E01	Hs.861	NM_002746	MAPK3	Mitogen-activated protein kinase 3
E02	Hs.484371	NM_002752	MAPK9	Mitogen-activated protein kinase 9
E03	Hs.338207	NM_004958	MTOR	Mechanistic target of rapamycin (serine/threonine kinase)
E04	Hs.489615	NM_005746	NAMPT	Nicotinamide phosphoribosyltransferase
E05	Hs.81328	NM_020529	NFKBIA	Nuclear factor of kappa light polypeptide gene enhancer in B-cells inhibitor, alpha
E06	Hs.159483	NM_183395	NLRP3	NLR family, pyrin domain containing 3
E07	Hs.412484	NM_002543	OLR1	Oxidized low density lipoprotein (lectin-like) receptor 1
E08	Hs.1872	NM_002591	PKC1	Phosphoenolpyruvate carboxykinase 1 (soluble)
E09	Hs.445711	NM_000922	PDE3B	Phosphodiesterase 3B, cGMP-inhibited
E10	Hs.256667	NM_002611	PDK2	Pyruvate dehydrogenase kinase, isozyme 2
E11	Hs.32938	NM_000209	PDX1	Pancreatic and duodenal homeobox 1
E12	Hs.553498	NM_006218	PIK3CA	Phosphoinositide-3-kinase, catalytic, alpha polypeptide
F01	Hs.132225	NM_181504	PIK3R1	Phosphoinositide-3-kinase, regulatory subunit 1 (alpha)
F02	Hs.103110	NM_005036	PPARA	Peroxisome proliferator-activated receptor alpha
F03	Hs.162646	NM_015869	PPARG	Peroxisome proliferator-activated receptor gamma
F04	Hs.527078	NM_013261	PPARGC1A	Peroxisome proliferator-activated receptor gamma, coactivator 1 alpha
F05	Hs.417549	NM_002827	PTPN1	Protein tyrosine phosphatase, non-receptor type 1
F06	Hs.499094	NM_013258	PYCARD	PYD and CARD domain containing
F07	Hs.50223	NM_006744	RBP4	Retinol binding protein 4, plasma
F08	Hs.502875	NM_021975	RELA	V-rel reticuloendotheliosis viral oncogene homolog A (avian)
F09	Hs.283091	NM_020415	RETN	Resistin
F10	Hs.463642	NM_003161	RPS6KB1	Ribosomal protein S6 kinase, 70kDa, polypeptide 1
F11	Hs.558396	NM_005063	SCD	Stearoyl-CoA desaturase (delta-9-desaturase)
F12	Hs.414795	NM_000602	SERPINE1	Serpin peptidase inhibitor, clade E (nexin, plasminogen activator inhibitor type 1), member 1
G01	Hs.363138	NM_198580	SLC27A1	Solute carrier family 27 (fatty acid transporter), member 1
G02	Hs.380691	NM_001042	SLC2A4	Solute carrier family 2 (facilitated glucose transporter), member 4
G03	Hs.527973	NM_003955	SOCS3	Suppressor of cytokine signaling 3
G04	Hs.592123	NM_004176	SREBF1	Sterol regulatory element binding transcription factor 1
G05	Hs.443258	NM_004599	SREBF2	Sterol regulatory element binding transcription factor 2
G06	Hs.463059	NM_003150	STAT3	Signal transducer and activator of transcription 3 (acute-phase response factor)
G07	Hs.174312	NM_138554	TLR4	Toll-like receptor 4
G08	Hs.241570	NM_000594	TNF	Tumor necrosis factor
G09	Hs.279594	NM_001065	TNFRSF1A	Tumor necrosis factor receptor superfamily, member 1A
G10	Hs.256278	NM_001066	TNFRSF1B	Tumor necrosis factor receptor superfamily, member 1B
G11	Hs.249211	NM_021833	UCP1	Uncoupling protein 1 (mitochondrial, proton carrier)
G12	Hs.370422	NM_003383	VLDLR	Very low density lipoprotein receptor
H01	Hs.520640	NM_001101	ACTB	Actin, beta
H02	Hs.534255	NM_004048	B2M	Beta-2-microglobulin
H03	Hs.592355	NM_002046	GAPDH	Glyceraldehyde-3-phosphate dehydrogenase
H04	Hs.412707	NM_000194	HPRT1	Hypoxanthine phosphoribosyltransferase 1
H05	Hs.546285	NM_001002	RPLP0	Ribosomal protein, large, P0
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

## Related products

For optimal performance, RT<sup>2</sup> Profiler PCR Arrays should be used together with the RT<sup>2</sup> First Strand Kit for cDNA synthesis and RT<sup>2</sup> SYBR<sup>®</sup> Green qPCR Mastermixes for PCR.

Product	Contents	Cat. no.
RT <sup>2</sup> First Strand Kit (12)	Enzymes and reagents for cDNA synthesis	330401
RT <sup>2</sup> SYBR Green qPCR Mastermix (2)*	For 2 x 96 assays in 96-well plates; suitable for use with real-time cyclers that do not require a reference dye, including: Bio-Rad models CFX96, CFX384, DNA Engine Opticon 2; Bio-Rad/MJ Research Chromo4; Roche LightCycler 480 (96-well and 384-well); all other cyclers	330500
RT <sup>2</sup> SYBR Green ROX™ qPCR Mastermix (2)*	For 2 x 96 assays in 96-well plates; suitable for use with the following real-time cyclers: Applied Biosystems models 5700, 7000, 7300, 7500 [Standard and FAST], 7700, 7900HT 96-well block [Standard and FAST] and 384-well block, StepOnePlus; Eppendorf Mastercycler ep realplex models 2, 2S, 4, 4S; Stratagene models Mx3000P, Mx3005P, Mx4000; Takara TP-800	330520
RT <sup>2</sup> SYBR Green Fluor qPCR Mastermix (2)*	For 2 x 96 assays in 96-well plates; suitable for use with the following real-time cyclers: Bio-Rad models iCycler, iQ5, MyiQ, MyiQ2	330510

\* Larger kit sizes available; please inquire.

RT<sup>2</sup> Profiler PCR Array products are intended for molecular biology applications. These products are not intended for the diagnosis, prevention, or treatment of a disease.

For up-to-date licensing information and product-specific disclaimers, see the respective QIAGEN kit handbook or user manual. QIAGEN kit handbooks and user manuals are available at [www.qiagen.com](http://www.qiagen.com) or can be requested from QIAGEN Technical Services or your local distributor.

Trademarks: QIAGEN® (QIAGEN Group); Applied Biosystems®, ViiA™, StepOnePlus™, ROX™ (Applied Biosystems Corporation or its subsidiaries); Bio-Rad®, iCycler®, iQ™, MyiQ™, Chromo4™, CFX96™, DNA Engine Opticon®, CFX384™ (Bio-Rad Laboratories, Inc.); Stratagene®, Mx3005P®, Mx3000P®, Mx4000® (Stratagene); Eppendorf®, Mastercycler® (Eppendorf AG); Roche®, LightCycler® (Roche Group); Fluidigm® BioMark™ (Fluidigm Corporation); SYBR® (Molecular Probes, Inc.).

1066029 03/2011 © 2011 QIAGEN, all rights reserved.

[www.qiagen.com](http://www.qiagen.com)

Canada ■ 800-572-9613

Ireland ■ 1800 555 049

Norway ■ 800-18859

China ■ 8621-3865-3865

Italy ■ 800-787980

Singapore ■ 1800-742-4368

Denmark ■ 80-885945

Japan ■ 03-6890-7300

Spain ■ 91-630-7050

Australia ■ 1-800-243-800

Finland ■ 0800-914416

Korea (South) ■ 080-000-7145

Sweden ■ 020-790282

Austria ■ 0800/281010

France ■ 01-60-920-930

Luxembourg ■ 8002 2076

Switzerland ■ 055-254-22-11

Belgium ■ 0800-79612

Germany ■ 02103-29-12000

Mexico ■ 01-800-7742-436

UK ■ 01293-422-911

Brazil ■ 0800-557779

Hong Kong ■ 800 933 965

The Netherlands ■ 0800 0229592

USA ■ 800-426-8157



Sample & Assay Technologies