

# RT<sup>2</sup> Profiler PCR Array (Rotor-Gene® Format)

## Human Fatty Liver

Cat. no. 330231 PAHS-157ZR

For pathway expression analysis

Format	For use with the following real-time cyclers
RT <sup>2</sup> Profiler PCR Array, Format R	Rotor-Gene Q, other Rotor-Gene cyclers

### Description

The Human Fatty Liver RT<sup>2</sup> Profiler PCR Array profiles the expression of 84 key genes involved in the mechanisms of nonalcoholic fatty liver disease (NAFLD) and hepatic insulin resistance. NAFLD is caused by excessive uptake of lipids by the liver and, if left untreated, can result in chronic inflammation and eventually steatohepatitis (NASH). This progressive hepatic disease often accompanies obesity, and has a complex set of causes that include insulin resistance as well as signaling effects from adipose tissue, pancreatic islets, and skeletal muscle. Insulin resistance is the primary symptom of non-insulin dependent diabetes mellitus (NIDDM), or type 2 diabetes. During food consumption, insulin release activates insulin signaling and cellular uptake of glucose, resulting in synthesis and storage of carbohydrates and lipids. Insulin-resistant individuals are vulnerable to multiple pathophysiologies as a result of residual blood glucose, including development of NIDDM. Individuals with NIDDM are often obese, and many have additional related pathologies (i. e., cardiovascular disease), collectively called the metabolic syndrome. Obesity upregulates adipokine secretion from adipose tissue, activating hepatic adipokine signaling while inhibiting hepatic insulin signaling. These 2 signaling pathways control the expression of many enzymes and transporters necessary for carbohydrate and lipid metabolism. In addition, hepatic oxidative phosphorylation is often disrupted during NAFLD and insulin resistance. This array includes hepatic genes involved in adipokine and insulin signaling, metabolic enzymes and transporters, genes commonly dysregulated in NIDDM, and genes involved in inflammation and apoptosis. The results of this array can yield insights into the mechanisms of insulin resistance and metabolic dysregulation in the liver. Using real-time PCR, researchers can easily and reliably analyze the expression of a focused panel of genes involved in NAFLD mechanisms with this array.

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

## Shipping and storage

RT<sup>2</sup> Profiler PCR Arrays in the Rotor-Gene format are shipped at ambient temperature, on dry ice, or blue ice packs depending on destination and accompanying products.

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

The 96 real-time assays in the Rotor-Gene format are located in wells 1–96 of the Rotor-Disc™ (plate A1–A12=Rotor-Disc 1–12, plate B1–B12=Rotor-Disc 13–24, etc.). To maintain data analysis compatibility, wells 97–100 do not contain real-time assays but will contain master mix to account for weight balance.

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

Position	UniGene	GenBank	Symbol	Description
A01	Hs.429294	NM_005502	ABCA1	ATP-binding cassette, sub-family A (ABC1), member 1
A02	Hs.160556	NM_198834	ACACA	Acetyl-CoA carboxylase alpha
A03	Hs.471277	NM_001608	ACADL	Acyl-CoA dehydrogenase, long chain
A04	Hs.387567	NM_001096	ACLY	ATP citrate lyase
A05	Hs.464137	NM_004035	ACOX1	Acyl-CoA oxidase 1, palmitoyl
A06	Hs.11638	NM_016234	ACSL5	Acyl-CoA synthetase long-chain family member 5
A07	Hs.706754	NM_005622	ACSM3	Acyl-CoA synthetase medium-chain family member 3
A08	Hs.5298	NM_015999	ADIPOR1	Adiponectin receptor 1
A09	Hs.371642	NM_024551	ADIPOR2	Adiponectin receptor 2
A10	Hs.525622	NM_005163	AKT1	V-akt murine thymoma viral oncogene homolog 1
A11	Hs.633003	NM_000039	APOA1	Apolipoprotein A-I
A12	Hs.120759	NM_000384	APOB	Apolipoprotein B (including Ag(x) antigen)
B01	Hs.73849	NM_000040	APOC3	Apolipoprotein C-III
B02	Hs.654439	NM_000041	APOE	Apolipoprotein E
B03	Hs.271135	NM_005174	ATP5C1	ATP synthase, H <sup>+</sup> transporting, mitochondrial F1 complex, gamma polypeptide 1
B04	Hs.141125	NM_004346	CASP3	Caspase 3, apoptosis-related cysteine peptidase
B05	Hs.120949	NM_000072	CD36	CD36 molecule (thrombospondin receptor)
B06	Hs.517106	NM_005194	CEBPB	CCAAT/enhancer binding protein (C/EBP), beta
B07	Hs.518249	NM_003418	CNBP	CCHC-type zinc finger, nucleic acid binding protein
B08	Hs.503043	NM_001876	CPT1A	Carnitine palmitoyltransferase 1A (liver)
B09	Hs.705379	NM_000098	CPT2	Carnitine palmitoyltransferase 2
B10	Hs.12907	NM_000773	CYP2E1	Cytochrome P450, family 2, subfamily E, polypeptide 1
B11	Hs.1644	NM_000780	CYP7A1	Cytochrome P450, family 7, subfamily A, polypeptide 1
B12	Hs.334305	NM_032564	DGAT2	Diacylglycerol O-acyltransferase 2
C01	Hs.380135	NM_001443	FABP1	Fatty acid binding protein 1, liver
C02	Hs.657242	NM_004102	FABP3	Fatty acid binding protein 3, muscle and heart (mammary-derived growth inhibitor)
C03	Hs.408061	NM_001444	FABP5	Fatty acid binding protein 5 (psoriasis-associated)
C04	Hs.244139	NM_000043	FAS	Fas (TNF receptor superfamily, member 6)
C05	Hs.83190	NM_004104	FASN	Fatty acid synthase
C06	Hs.155651	NM_021784	FOXA2	Forkhead box A2
C07	Hs.370666	NM_002015	FOXO1	Forkhead box O1
C08	Hs.212293	NM_000151	G6PC	Glucose-6-phosphatase, catalytic subunit
C09	Hs.461047	NM_000402	G6PD	Glucose-6-phosphate dehydrogenase
C10	Hs.1270	NM_000162	GCK	Glucokinase (hexokinase 4)
C11	Hs.1466	NM_000167	GK	Glycerol kinase
C12	Hs.445733	NM_002093	GSK3B	Glycogen synthase kinase 3 beta
D01	Hs.643495	NM_000859	HMGCR	3-hydroxy-3-methylglutaryl-CoA reductase
D02	Hs.116462	NM_178849	HNF4A	Hepatocyte nuclear factor 4, alpha
D03	Hs.856	NM_000619	IFNG	Interferon, gamma
D04	Hs.160562	NM_000618	IGF1	Insulin-like growth factor 1 (somatomedin C)
D05	Hs.642938	NM_000596	IGFBP1	Insulin-like growth factor binding protein 1
D06	Hs.193717	NM_000572	IL10	Interleukin 10
D07	Hs.126256	NM_000576	IL1B	Interleukin 1, beta
D08	Hs.654458	NM_000600	IL6	Interleukin 6 (interferon, beta 2)
D09	Hs.465744	NM_000208	INSR	Insulin receptor
D10	Hs.471508	NM_005544	IRS1	Insulin receptor substrate 1
D11	Hs.213289	NM_000527	LDLR	Low density lipoprotein receptor
D12	Hs.705413	NM_002303	LEPR	Leptin receptor
E01	Hs.180878	NM_000237	LPL	Lipoprotein lipase
E02	Hs.431850	NM_002745	MAPK1	Mitogen-activated protein kinase 1
E03	Hs.138211	NM_002750	MAPK8	Mitogen-activated protein kinase 8
E04	Hs.647055	NM_032951	MLXIP	MLX interacting protein-like
E05	Hs.338207	NM_004958	MTOR	Mechanistic target of rapamycin (serine/threonine kinase)
E06	Hs.493668	NM_182739	NDUFB6	NADH dehydrogenase (ubiquinone) 1 beta subcomplex, 6, 17kDa
E07	Hs.654408	NM_003998	NFKB1	Nuclear factor of kappa light polypeptide gene enhancer in B-cells 1

Position	UniGene	GenBank	Symbol	Description
E08	Hs.432976	NM_007121	NR1H2	Nuclear receptor subfamily 1, group H, member 2
E09	Hs.438863	NM_005693	NR1H3	Nuclear receptor subfamily 1, group H, member 3
E10	Hs.282735	NM_005123	NR1H4	Nuclear receptor subfamily 1, group H, member 4
E11	Hs.75812	NM_004563	PCK2	Phosphoenolpyruvate carboxykinase 2 (mitochondrial)
E12	Hs.8364	NM_002612	PK4	Pyruvate dehydrogenase kinase, isozyme 4
F01	Hs.553498	NM_006218	PIK3CA	Phosphoinositide-3-kinase, catalytic, alpha polypeptide
F02	Hs.132225	NM_181504	PIK3R1	Phosphoinositide-3-kinase, regulatory subunit 1 (alpha)
F03	Hs.95990	NM_000298	PKLR	Pyruvate kinase, liver and RBC
F04	Hs.654800	NM_025225	PNPLA3	Patatin-like phospholipase domain containing 3
F05	Hs.437403	NM_021129	PPA1	Pyrophosphatase (inorganic) 1
F06	Hs.103110	NM_005036	PPARA	Peroxisome proliferator-activated receptor alpha
F07	Hs.162646	NM_015869	PPARG	Peroxisome proliferator-activated receptor gamma
F08	Hs.527078	NM_013261	PPARGC1A	Peroxisome proliferator-activated receptor gamma, coactivator 1 alpha
F09	Hs.43322	NM_006251	PRKAA1	Protein kinase, AMP-activated, alpha 1 catalytic subunit
F10	Hs.417549	NM_002827	PTPN1	Protein tyrosine phosphatase, non-receptor type 1
F11	Hs.50223	NM_006744	RBP4	Retinol binding protein 4, plasma
F12	Hs.590886	NM_002957	RXRA	Retinoid X receptor, alpha
G01	Hs.558396	NM_005063	SCD	Arylacetamide deacetylase
G02	Hs.414795	NM_000602	SERPINE1	Serpin peptidase inhibitor, clade E (nexin, plasminogen activator inhibitor type 1), member 1
G03	Hs.292177	NM_012254	SLC27A5	Solute carrier family 27 (fatty acid transporter), member 5
G04	Hs.473721	NM_006516	SLC2A1	Solute carrier family 2 (facilitated glucose transporter), member 1
G05	Hs.167584	NM_000340	SLC2A2	Solute carrier family 2 (facilitated glucose transporter), member 2
G06	Hs.380691	NM_001042	SLC2A4	Solute carrier family 2 (facilitated glucose transporter), member 4
G07	Hs.527973	NM_003955	SOCS3	Suppressor of cytokine signaling 3
G08	Hs.592123	NM_004176	SREBF1	Sterol regulatory element binding transcription factor 1
G09	Hs.443258	NM_004599	SREBF2	Sterol regulatory element binding transcription factor 2
G10	Hs.463059	NM_003150	STAT3	Signal transducer and activator of transcription 3 (acute-phase response factor)
G11	Hs.241570	NM_000594	TNF	Tumor necrosis factor
G12	Hs.437638	NM_005080	XBP1	X-box binding protein 1
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 ROX <sup>™</sup> FAST Mastermix (2)*	For 2 x 96 assays in 96-well plates; suitable for use with the Rotor-Gene Q and other Rotor-Gene cyclers	330620

\* Larger kit sizes available; please inquire.

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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.

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