RT² Profiler PCR Array (96-Well Format and 384-Well [4 x 96] Format)

Mouse AMPK Signaling

Cat. no. 330231 PAMM-175ZA

For pathway expression analysis

Format	For use with the following real-time cyclers
RT² 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
RT² Profiler PCR Array, Format C	Applied Biosystems models 7500 (Fast block), 7900HT (Fast block), StepOnePlus™, ViiA 7 (Fast block)
RT² Profiler PCR Array, Format D	Bio-Rad CFX96™; Bio-Rad/MJ Research models DNA Engine Opticon®, DNA Engine Opticon 2; Stratagene Mx4000®
RT² Profiler PCR Array, Format E	Applied Biosystems models 7900HT (384-well block), ViiA 7 (384-well block); Bio-Rad CFX384™
RT² Profiler PCR Array, Format F	Roche® LightCycler® 480 (96-well block)
RT² Profiler PCR Array, Format G	Roche LightCycler 480 (384-well block)
RT² Profiler PCR Array, Format H	Fluidigm® BioMark™

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Description

The Mouse AMPK Signaling RT² Profiler PCR Array profiles the expression of 84 key genes involved in signal transduction by the AMP-activated protein kinase complex (AMPK). AMPK is a heterotrimeric complex composed of a catalytic alpha subunit and regulatory beta and gamma subunits. AMP binds the regulatory gamma subunit to allosterically open the alpha subunit for phosphorylation and activation by LKB1 (STK11) or calcium/calmodulin-dependent protein kinases (CAMKK). Cellular stresses that inhibit ATP production (such as low glucose, hypoxia, ischemia, and heat shock), hormone signaling (via AKT and PI3 kinase), and cAMP-dependent protein kinase all activate AMPK complex. AMPK activity then stimulates ATP synthetic processes (such as fatty acid oxidation and autophagy) and suppresses ATP consumptive processes (such as gluconeogenesis, lipid synthesis, and protein synthesis). AMPK signaling exerts its control at both the post-translational and transcriptional levels by phosphorylating either the proteins directly involved in these processes or the transcription factors regulating their expression, respectively. Its role in controlling both glucose and lipid metabolism makes AMPK a potential therapeutic target for treating type II diabetes mellitus, obesity, and cancer. AMPK also plays critical roles in models of aging by modulating mTOR signaling. Analyzing the expression of AMPK signaling genes can help to clarify its role in these normal and pathophysiological processes at the molecular level. The genes on this array encode the components of the kinase complex itself, its upstream regulators, and its targets in several key biological processes. A set of controls present on each array enables data analysis using the ΔΔCT method of relative quantification and assessment of reverse transcription performance, genomic DNA contamination, and PCR performance. Using real-time PCR, research studies can easily and reliably analyze the expression of a focused panel of genes responsive to AMPK signaling with this array.

For further details, consult the *RT² Profiler PCR Array Handbook*.

Shipping and storage

RT² 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. RT² 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 RT² 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 *RT² Profiler PCR Array Handbook* for layout.

	1	2	3	4	5	6	7	8	9	10	11	12
A	Acaca	Acacb	Adipor1	Adipor2	Adra1a	Adra1b	Adra1d	Adra2a	Adra2b	Adra2c	Ak1	Ak2
B	Ak3	Akt1	Akt2	Akt3	Atg13	Cab39	Camkk1	Camkk2	Chrna1	Chrnb1	Cpt1a	Cpt1b
C	Cpt1c	Cpt2	Crtc2	Cry1	Eef2k	Eif4ebp1	Elavl1	Fasn	Foxo3	Gpam	Gpat2	Gys1
D	Gys2	Hmgcr	Hnf4a	Insr	Lepr	Lipe	Mlycd	Mtor	Pdpk1	Pfkfb1	Pfkfb2	Pfkfb3
E	Pfkfb4	Pnpla2	Ppargc1a	Ppargc1b	Ppp2ca	Ppp2cb	Ppp2r1a	Ppp2r1b	Ppp2r2b	Ppp2r4	Prkaa1	Prkaa2
F	Prkab1	Prkab2	Prkaca	Prkacb	Prkag1	Prkag2	Prkag3	Prkar1a	Prkar1b	Prkar2a	Prkar2b	Rb1cc1
G	Rps6kb1	Rps6kb2	Rptor	Slc2a4	Srebf1	Stk11	Strada	Stradb	Trp53	Tsc1	Tsc2	Ulk1
H	Actb	B2m	Gapdh	Gusb	Hsp90ab1	MGDC	RTC	RTC	RTC	PPC	PPC	PPC

Gene table: RT² Profiler PCR Array

Position	UniGene	GenBank	Symbol	Description
A01	Mm.31374	NM_133360	Acaca	Acetyl-Coenzyme A carboxylase alpha
A02	Mm.81793	NM_133904	Acacb	Acetyl-Coenzyme A carboxylase beta
A03	Mm.259976	NM_028320	Adipor1	Adiponectin receptor 1
A04	Mm.291826	NM_197985	Adipor2	Adiponectin receptor 2
A05	Mm.57064	NM_013461	Adra1a	Adrenergic receptor, alpha 1a
A06	Mm.39086	NM_007416	Adra1b	Adrenergic receptor, alpha 1b
A07	Mm.389380	NM_013460	Adra1d	Adrenergic receptor, alpha 1d
A08	Mm.235195	NM_007417	Adra2a	Adrenergic receptor, alpha 2a
A09	Mm.347390	NM_009633	Adra2b	Adrenergic receptor, alpha 2b
A10	Mm.57205	NM_007418	Adra2c	Adrenergic receptor, alpha 2c
A11	Mm.29189	NM_021515	Ak1	Adenylate kinase 1
A12	Mm.29460	NM_016895	Ak2	Adenylate kinase 2
B01	Mm.196067	NM_021299	Ak3	Adenylate kinase 3
B02	Mm.6645	NM_009652	Akt1	Thymoma viral proto-oncogene 1
B03	Mm.177194	NM_007434	Akt2	Thymoma viral proto-oncogene 2
B04	Mm.235194	NM_011785	Akt3	Thymoma viral proto-oncogene 3
B05	Mm.28492	NM_145528	Atg13	ATG13 autophagy related 13 homolog (S. cerevisiae)
B06	Mm.26135	NM_133781	Cab39	Calcium binding protein 39
B07	Mm.9998	NM_018883	Camkk1	Calcium/calmodulin-dependent protein kinase kinase 1, alpha
B08	Mm.289237	NM_145358	Camkk2	Calcium/calmodulin-dependent protein kinase kinase 2, beta
B09	Mm.4583	NM_007389	Chrna1	Cholinergic receptor, nicotinic, alpha polypeptide 1 (muscle)
B10	Mm.86425	NM_009601	Chrnb1	Cholinergic receptor, nicotinic, beta polypeptide 1 (muscle)
B11	Mm.18522	NM_013495	Cpt1a	Carnitine palmitoyltransferase 1a, liver
B12	Mm.227738	NM_009948	Cpt1b	Carnitine palmitoyltransferase 1b, muscle
C01	Mm.231465	NM_153679	Cpt1c	Carnitine palmitoyltransferase 1c
C02	Mm.307620	NM_009949	Cpt2	Carnitine palmitoyltransferase 2
C03	Mm.35627	NM_028881	Crtc2	CREB regulated transcription coactivator 2
C04	Mm.26237	NM_007771	Cry1	Cryptochrome 1 (photolyase-like)
C05	Mm.25997	NM_007908	Eef2k	Eukaryotic elongation factor-2 kinase
C06	Mm.6700	NM_007918	Eif4ebp1	Eukaryotic translation initiation factor 4E binding protein 1
C07	Mm.119162	NM_010485	Elavl1	ELAV (embryonic lethal, abnormal vision, Drosophila)-like 1 (Hu antigen R)
C08	Mm.236443	NM_007988	Fasn	Fatty acid synthase
C09	Mm.338613	NM_019740	Foxo3	Forkhead box O3
C10	Mm.210196	NM_008149	Gpam	Glycerol-3-phosphate acyltransferase, mitochondrial
C11	Mm.440454	NM_001081089	Gpat2	Glycerol-3-phosphate acyltransferase 2, mitochondrial
C12	Mm.275654	NM_030678	Gys1	Glycogen synthase 1, muscle
D01	Mm.275975	NM_145572	Gys2	Glycogen synthase 2
D02	Mm.316652	NM_008255	Hmgcr	3-hydroxy-3-methylglutaryl-Coenzyme A reductase
D03	Mm.202383	NM_008261	Hnf4a	Hepatic nuclear factor 4, alpha
D04	Mm.268003	NM_010568	Insr	Insulin receptor
D05	Mm.259282	NM_010704	Lepr	Leptin receptor
D06	Mm.333679	NM_010719	Lipe	Lipase, hormone sensitive
D07	Mm.423037	NM_019966	Mlycd	Malonyl-CoA decarboxylase
D08	Mm.21158	NM_020009	Mtor	Mechanistic target of rapamycin (serine/threonine kinase)
D09	Mm.10504	NM_011062	Pdpk1	3-phosphoinositide dependent protein kinase 1

Position	UniGene	GenBank	Symbol	Description
D10	Mm.249131	NM_008824	Pfkfb1	6-phosphofructo-2-kinase/fructose-2,6-biphosphatase 1
D11	Mm.249861	NM_008825	Pfkfb2	6-phosphofructo-2-kinase/fructose-2,6-biphosphatase 2
D12	Mm.19669	NM_133232	Pfkfb3	6-phosphofructo-2-kinase/fructose-2,6-biphosphatase 3
E01	Mm.132391	NM_173019	Pfkfb4	6-phosphofructo-2-kinase/fructose-2,6-biphosphatase 4
E02	Mm.29998	NM_025802	Pnpla2	Patatin-like phospholipase domain containing 2
E03	Mm.259072	NM_008904	Ppargc1a	Peroxisome proliferative activated receptor, gamma, coactivator 1 alpha
E04	Mm.415302	NM_133249	Ppargc1b	Peroxisome proliferative activated receptor, gamma, coactivator 1 beta
E05	Mm.260288	NM_019411	Ppp2ca	Protein phosphatase 2 (formerly 2A), catalytic subunit, alpha isoform
E06	Mm.288765	NM_017374	Ppp2cb	Protein phosphatase 2 (formerly 2A), catalytic subunit, beta isoform
E07	Mm.294138	NM_016891	Ppp2r1a	Protein phosphatase 2 (formerly 2A), regulatory subunit A (PR 65), alpha isoform
E08	Mm.7726	NM_001034085	Ppp2r1b	Protein phosphatase 2 (formerly 2A), regulatory subunit A (PR 65), beta isoform
E09	Mm.26134	NM_028392	Ppp2r2b	Protein phosphatase 2 (formerly 2A), regulatory subunit B (PR 52), beta isoform
E10	Mm.275393	NM_138748	Ppp2r4	Protein phosphatase 2A, regulatory subunit B (PR 53)
E11	Mm.207004	NM_001013367	Prkaa1	Protein kinase, AMP-activated, alpha 1 catalytic subunit
E12	Mm.48638	NM_178143	Prkaa2	Protein kinase, AMP-activated, alpha 2 catalytic subunit
F01	Mm.458152	NM_031869	Prkab1	Protein kinase, AMP-activated, beta 1 non-catalytic subunit
F02	Mm.31175	NM_182997	Prkab2	Protein kinase, AMP-activated, beta 2 non-catalytic subunit
F03	Mm.19111	NM_008854	Prkaca	Protein kinase, cAMP dependent, catalytic, alpha
F04	Mm.16766	NM_011100	Prkacb	Protein kinase, cAMP dependent, catalytic, beta
F05	Mm.6670	NM_016781	Prkag1	Protein kinase, AMP-activated, gamma 1 non-catalytic subunit
F06	Mm.33649	NM_145401	Prkag2	Protein kinase, AMP-activated, gamma 2 non-catalytic subunit
F07	Mm.166501	NM_153744	Prkag3	Protein kinase, AMP-activated, gamma 3 non-catatlytic subunit
F08	Mm.30039	NM_021880	Prkar1a	Protein kinase, cAMP dependent regulatory, type I, alpha
F09	Mm.306163	NM_008923	Prkar1b	Protein kinase, cAMP dependent regulatory, type I beta
F10	Mm.253102	NM_008924	Prkar2a	Protein kinase, cAMP dependent regulatory, type II alpha
F11	Mm.25594	NM_011158	Prkar2b	Protein kinase, cAMP dependent regulatory, type II beta
F12	Mm.293811	NM_009826	Rb1cc1	RB1-inducible coiled-coil 1
G01	Mm.394280	NM_028259	Rps6kb1	Ribosomal protein S6 kinase, polypeptide 1
G02	Mm.271937	NM_021485	Rps6kb2	Ribosomal protein S6 kinase, polypeptide 2
G03	Mm.442144	NM_028898	Rptor	Regulatory associated protein of MTOR, complex 1
G04	Mm.10661	NM_009204	Slc2a4	Solute carrier family 2 (facilitated glucose transporter), member 4
G05	Mm.278701	NM_011480	Srebf1	Sterol regulatory element binding transcription factor 1
G06	Mm.44231	NM_011492	Stk11	Serine/threonine kinase 11
G07	Mm.403722	NM_028126	Strada	STE20-related kinase adaptor alpha
G08	Mm.286006	NM_172656	Stradb	STE20-related kinase adaptor beta
G09	Mm.222	NM_011640	Trp53	Transformation related protein 53
G10	Mm.224354	NM_022887	Tsc1	Tuberous sclerosis 1
G11	Mm.30435	NM_011647	Tsc2	Tuberous sclerosis 2
G12	Mm.271898	NM_009469	Ulk1	Unc-51 like kinase 1 (C. elegans)
H01	Mm.328431	NM_007393	Actb	Actin, beta
H02	Mm.163	NM_009735	B2m	Beta-2 microglobulin
H03	Mm.309092	NM_008084	Gapdh	Glyceraldehyde-3-phosphate dehydrogenase
H04	Mm.3317	NM_010368	Gusb	Glucuronidase, beta
H05	Mm.2180	NM_008302	Hsp90ab1	Heat shock protein 90 alpha (cytosolic), class B member 1
H06	N/A	SA_00106	MGDC	Mouse 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, RT² Profiler PCR Arrays should be used together with the RT² First Strand Kit for cDNA synthesis and RT2 SYBR® Green qPCR Mastermixes for PCR.

Product	Contents	Cat. no.
RT² First Strand Kit (12)	Enzymes and reagents for cDNA synthesis	330401
RT² 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
RT² 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
RT² 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.

RT² 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 or can be requested from QIAGEN Technical Services or your local distributor.

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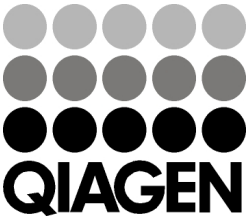

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