

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

Rat Mitochondrial Energy Metabolism

Cat. no. 330231 PARN-008ZA

For pathway expression analysis

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



Sample & Assay Technologies

Description

The Rat Mitochondrial Energy Metabolism RT² Profiler PCR Array profiles the expression of 84 key genes involved in mitochondrial respiration, including genes encoding components of the electron transport chain and oxidative phosphorylation complexes. Oxidation of NADH and FADH₂, the metabolites from glycolysis and the TCA cycle, occurs via a series of four protein complexes embedded in the inner mitochondrial membrane: NADH-coenzyme Q reductase, succinate-coenzyme Q reductase, coenzyme Q-cytochrome c reductase, and cytochrome c oxidase. The free energy generated from these processes drives oxidative phosphorylation and ATP synthesis via a fifth protein complex (ATP Synthase). Dysregulation of these processes is a major pathological consequence of cancer progression. Many tumors contain decreased amounts of mitochondrial respiratory chain components, although the exact mechanism for this repression is unclear. However, recent studies demonstrate that the important tumor suppressor p53 induces the expression of COX2, an essential component for cytochrome c oxidase function. Mitochondrial dysfunction also contributes to metabolic syndrome and obesity, where excess β -oxidation overloads oxidative phosphorylation by generating excessive amounts of NADH. Using real-time PCR, you can easily and reliably analyze the expression of a focused panel of genes involved in mitochondrial energy metabolism 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	Atp12a	Atp4a	Atp4b	Atp5a1	Atp5b	Atp5c1	Atp5d	Atp5f1	Atp5g2	Atp5g3	Atp5h	Atp5i
B	Atp5j	Atp5l	Atp5o	Atp6ap1	Atp6v0a2	Atp6v0d2	Atp6v1c2	Atp6v1e2	Atp6v1g3	Bcs1l	Cox15	Cox17
C	Cox4i1	Cox4i2	Cox5a	Cox5b	Cox6a1	Cox6a2	Cox6c	Cox7a2	Cox7a2l	Cox7b	Cox8a	Cox8c
D	Cyc1	Lhpp	Ndufa1	Ndufa10	Ndufa11	Ndufa2	Ndufa5	Ndufa6	Ndufa7	Ndufa8	Ndufa9	Ndufab1
E	Ndufb2	Ndufb3	Ndufb5	Ndufb6	Ndufb7	Ndufb8	Ndufb9	Ndufc2	Ndufs1	Ndufs2	Ndufs3	Ndufs4
F	Ndufs6	Ndufs7	Ndufs8	Ndufv1	Ndufv2	Nnt	Ppa1	Sdha	Sdhb	Sdhc	Sdhd	Slc25a10
G	Slc25a15	Slc25a20	Surf1	Ucp1	Ucp2	Ucp3	Uqcrb	Uqcrc1	Uqcrc2	Uqcrls1	Uqcrh	Uqcrq
H	Actb	B2m	Hprt1	Ldha	Rplp1	RGDC	RTC	RTC	RTC	PPC	PPC	PPC

Gene table: RT² Profiler PCR Array

Position	UniGene	GenBank	Symbol	Description
A01	Rn.9858	NM_133517	Atp12a	ATPase, H+/K+ transporting, nongastric, alpha polypeptide
A02	Rn.214529	NM_012509	Atp4a	ATPase, H+/K+ exchanging, alpha polypeptide
A03	Rn.10033	NM_012510	Atp4b	ATPase, H+/K+ exchanging, beta polypeptide
A04	Rn.40255	NM_023093	Atp5a1	ATP synthase, H+ transporting, mitochondrial F1 complex, alpha subunit 1, cardiac muscle
A05	Rn.92965	NM_134364	Atp5b	ATP synthase, H+ transporting, mitochondrial F1 complex, beta polypeptide
A06	Rn.63959	NM_053825	Atp5c1	ATP synthase, H+ transporting, mitochondrial F1 complex, gamma polypeptide 1
A07	Rn.3879	NM_139106	Atp5d	ATP synthase, H+ transporting, mitochondrial F1 complex, delta subunit
A08	Rn.3689	NM_134365	Atp5f1	ATP synthase, H+ transporting, mitochondrial F0 complex, subunit B1
A09	Rn.127811	NM_133556	Atp5g2	ATP synthase, H+ transporting, mitochondrial F0 complex, subunit C2 (subunit 9)
A10	Rn.2180	NM_053756	Atp5g3	ATP synthase, H+ transporting, mitochondrial F0 complex, subunit C3 (subunit 9)
A11	Rn.80	NM_019383	Atp5h	ATP synthase, H+ transporting, mitochondrial F0 complex, subunit d
A12	Rn.66347	NM_080481	Atp5i	ATP synthase, H+ transporting, mitochondrial F0 complex, subunit e
B01	Rn.5790	NM_053602	Atp5j	ATP synthase, H+ transporting, mitochondrial F0 complex, subunit F6
B02	Rn.107458	NM_212516	Atp5l	ATP synthase, H+ transporting, mitochondrial F0 complex, subunit G
B03	Rn.1817	NM_138883	Atp5o	ATP synthase, H+ transporting, mitochondrial F1 complex, O subunit
B04	Rn.93045	NM_031785	Atp6ap1	ATPase, H+ transporting, lysosomal accessory protein 1
B05	Rn.204067	NM_053775	Atp6v0a2	ATPase, H+ transporting, lysosomal V0 subunit A2
B06	Rn.83540	NM_001011972	Atp6v0d2	ATPase, H+ transporting, lysosomal V0 subunit D2
B07	Rn.145217	NM_001014199	Atp6v1c2	ATPase, H+ transporting, lysosomal V1 subunit C2
B08	Rn.161896	NM_001108979	Atp6v1e2	ATPase, H transporting, lysosomal V1 subunit E2
B09	Rn.14800	NM_001105991	Atp6v1g3	ATPase, H+ transporting, lysosomal V1 subunit G3
B10	Rn.15293	NM_001007666	Bcs1l	BCS1-like (yeast)
B11	Rn.1309	NM_001033699	Cox15	COX15 homolog, cytochrome c oxidase assembly protein (yeast)
B12	Rn.19207	NM_053540	Cox17	COX17 cytochrome c oxidase assembly homolog (S. cerevisiae)
C01	Rn.2528	NM_017202	Cox4i1	Cytochrome c oxidase subunit IV isoform 1
C02	Rn.7214	NM_053472	Cox4i2	Cytochrome c oxidase subunit IV isoform 2
C03	Rn.11077	NM_145783	Cox5a	Cytochrome c oxidase, subunit Va
C04	Rn.6686	NM_053586	Cox5b	Cytochrome c oxidase subunit Vb
C05	Rn.880	NM_012814	Cox6a1	Cytochrome c oxidase, subunit VIa, polypeptide 1
C06	Rn.5119	NM_012812	Cox6a2	Cytochrome c oxidase subunit VIa polypeptide 2
C07	Rn.846	NM_019360	Cox6c	Cytochrome c oxidase, subunit VIc
C08	Rn.1745	NM_022503	Cox7a2	Cytochrome c oxidase subunit VIIa polypeptide 2
C09	Rn.3907	NM_001106704	Cox7a2l	Cytochrome c oxidase subunit VIIa polypeptide 2 like
C10	Rn.2026	NM_182819	Cox7b	Cytochrome c oxidase subunit VIIb
C11	Rn.2270	NM_134345	Cox8a	Cytochrome c oxidase subunit VIIa
C12	Rn.98192	NM_183055	Cox8c	Cytochrome c oxidase, subunit VIIc
D01	Rn.1413	NM_001130491	Cyc1	Cytochrome c-1
D02	Rn.15275	NM_001009706	Lhpp	Phospholysine phosphohistidine inorganic pyrophosphate phosphatase
D03	Rn.3640	NM_001108813	Ndufa1	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, 1
D04	Rn.102304	NM_199495	Ndufa10	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex 10
D05	Rn.96380	NM_212517	Ndufa11	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex 11

Position	UniGene	GenBank	Symbol	Description
D06	Rn.19077	NM_001106153	Ndufa2	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, 2
D07	Rn.100240	NM_012985	Ndufa5	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex 5
D08	Rn.4013	NM_001130505	Ndufa6	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, 6 (B14)
D09	Rn.3422	NM_001106772	Ndufa7	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, 7
D10	Rn.202907	NM_001047862	Ndufa8	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, 8
D11	Rn.107963	NM_001100752	Ndufa9	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, 9
D12	Rn.1318	NM_001106294	Ndufab1	NADH dehydrogenase (ubiquinone) 1, alpha/beta subcomplex, 1
E01	Rn.18013	NM_001108624	Ndufb2	NADH dehydrogenase (ubiquinone) 1 beta subcomplex, 2
E02	Rn.17057	NM_001106912	Ndufb3	NADH dehydrogenase (ubiquinone) 1 beta subcomplex 3
E03	Rn.3367	NM_001106426	Ndufb5	NADH dehydrogenase (ubiquinone) 1 beta subcomplex, 5
E04	Rn.104528	NM_001106646	Ndufb6	NADH dehydrogenase (ubiquinone) 1 beta subcomplex, 6
E05	Rn.105421	NM_001108442	Ndufb7	NADH dehydrogenase (ubiquinone) 1 beta subcomplex, 7
E06	Rn.3383	NM_001106360	Ndufb8	NADH dehydrogenase (ubiquinone) 1 beta subcomplex 8
E07	Rn.22045	NM_001127294	Ndufb9	NADH dehydrogenase (ubiquinone) 1 beta subcomplex, 9
E08	Rn.62471	NM_001009290	Ndufc2	NADH dehydrogenase (ubiquinone) 1, subcomplex unknown, 2
E09	Rn.1467	NM_001005550	Ndufs1	NADH dehydrogenase (ubiquinone) Fe-S protein 1
E10	Rn.99666	NM_001011907	Ndufs2	NADH dehydrogenase (ubiquinone) Fe-S protein 2
E11	Rn.1261	NM_001106489	Ndufs3	NADH dehydrogenase (ubiquinone) Fe-S protein 3
E12	Rn.203141	NM_001025146	Ndufs4	NADH dehydrogenase (ubiquinone) Fe-S protein 4
F01	Rn.154403	NM_019223	Ndufs6	NADH dehydrogenase (ubiquinone) Fe-S protein 6
F02	Rn.2855	NM_001008525	Ndufs7	NADH dehydrogenase (ubiquinone) Fe-S protein 7
F03	Rn.3373	NM_001106322	Ndufs8	NADH dehydrogenase (ubiquinone) Fe-S protein 8
F04	Rn.3159	NM_001006972	Ndufv1	NADH dehydrogenase (ubiquinone) flavoprotein 1
F05	Rn.28882	NM_031064	Ndufv2	NADH dehydrogenase (ubiquinone) flavoprotein 2
F06	Rn.3128	NM_001013157	Nnt	Nicotinamide nucleotide transhydrogenase
F07	Rn.106916	NM_001100834	Ppa1	Pyrophosphatase (inorganic) 1
F08	Rn.101725	NM_130428	Sdha	Succinate dehydrogenase complex, subunit A, flavoprotein (Fp)
F09	Rn.3902	NM_001100539	Sdhb	Succinate dehydrogenase complex, subunit B, iron sulfur (Ip)
F10	Rn.1698	NM_001005534	Sdhc	Succinate dehydrogenase complex, subunit C, integral membrane protein
F11	Rn.3040	NM_198788	Sdhd	Succinate dehydrogenase complex, subunit D, integral membrane protein
F12	Rn.3631	NM_133418	Slc25a10	Solute carrier family 25 (mitochondrial carrier; dicarboxylate transporter), member 10
G01	Rn.163331	NM_001047880	Slc25a15	Solute carrier family 25 (mitochondrial carrier; ornithine transporter) member 15
G02	Rn.3289	NM_053965	Slc25a20	Solute carrier family 25 (carnitine/acylcarnitine translocase), member 20
G03	Rn.74313	NM_172068	Surf1	Surfeit 1
G04	Rn.10281	NM_012682	Ucp1	Uncoupling protein 1 (mitochondrial, proton carrier)
G05	Rn.13333	NM_019354	Ucp2	Uncoupling protein 2 (mitochondrial, proton carrier)
G06	Rn.9902	NM_013167	Ucp3	Uncoupling protein 3 (mitochondrial, proton carrier)
G07	Rn.129215	NM_001127553	Uqcrb	Ubiquinol-cytochrome c reductase binding protein
G08	Rn.3428	NM_001004250	Uqcrc1	Ubiquinol-cytochrome c reductase core protein 1
G09	Rn.2334	NM_001006970	Uqcrc2	Ubiquinol cytochrome c reductase core protein 2
G10	Rn.2603	NM_001008888	Uqcrcf1	Ubiquinol-cytochrome c reductase, Rieske iron-sulfur polypeptide 1
G11	Rn.7401	NM_001009480	Uqcrh	Ubiquinol-cytochrome c reductase hinge protein
G12	Rn.3472	NM_001025134	Uqcrcq	Ubiquinol-cytochrome c reductase, complex III subunit VII
H01	Rn.94978	NM_031144	Actb	Actin, beta
H02	Rn.1868	NM_012512	B2m	Beta-2 microglobulin
H03	Rn.47	NM_012583	Hprt1	Hypoxanthine phosphoribosyltransferase 1
H04	Rn.107896	NM_017025	Ldha	Lactate dehydrogenase A
H05	Rn.973	NM_001007604	Rplp1	Ribosomal protein, large, P1
H06	N/A	U26919	RGDC	Rat 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.
RT ² First Strand Kit (12)	Enzymes and reagents for cDNA synthesis	330401
RT ² 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 ² 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 ² 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.

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