

RT² Profiler PCR Array (Rotor-Gene® Format)

Cow Mitochondrial Energy Metabolism

Cat. no. 330231 PABT-008ZR

For pathway expression analysis

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

Description

The Cow 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 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 RT² Profiler PCR Array format for your real-time cyclers (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: RT² Profiler PCR Array

Position	UniGene	GenBank	Symbol	Description
1	N/A	XM_002691870	ATP12A	ATPase, H+/K+ transporting, nongastric, alpha polypeptide
2	Bt.28236	NM_001144089	ATP4A	ATPase, H+/K+ exchanging, alpha polypeptide
3	Bt.29440	NM_001206140	ATP4B	ATPase, H+/K+ exchanging, beta polypeptide
4	Bt.7194	NM_174684	ATP5A1	ATP synthase, H+ transporting, mitochondrial F1 complex, alpha subunit 1, cardiac muscle
5	Bt.4431	NM_175796	ATP5B	ATP synthase, H+ transporting, mitochondrial F1 complex, beta polypeptide
6	Bt.20727	NM_001075136	ATP5C1	ATP synthase, H+ transporting, mitochondrial F1 complex, gamma polypeptide 1
7	Bt.3867	NM_001038501	ATP5F1	ATP synthase, H+ transporting, mitochondrial Fo complex, subunit B1
8	Bt.1242	NM_176649	ATP5G1	ATP synthase, H+ transporting, mitochondrial Fo complex, subunit C1 (subunit 9)
9	Bt.64851	NM_176613	ATP5G2	ATP synthase, H+ transporting, mitochondrial Fo complex, subunit C2 (subunit 9)
10	Bt.49343	NM_001034692	ATP5G3	ATP synthase, H+ transporting, mitochondrial Fo complex, subunit C3 (subunit 9)
11	Bt.5029	NM_174724	ATP5H	ATP synthase, H+ transporting, mitochondrial Fo complex, subunit d
12	Bt.49173	NM_176639	ATP5I	ATP synthase, H+ transporting, mitochondrial Fo complex, subunit E
13	Bt.404	NM_174717	ATP5J	ATP synthase, H+ transporting, mitochondrial Fo complex, subunit F6
14	Bt.59381	NM_001113719	ATP5J2	ATP synthase, H+ transporting, mitochondrial Fo complex, subunit F2
15	Bt.49172	NM_174244	ATP5O	ATP synthase, H+ transporting, mitochondrial F1 complex, O subunit
16	Bt.16017	NM_176637	ATP6V0A2	ATPase, H+ transporting, lysosomal V0 subunit a2
17	Bt.10174	NM_001046101	ATP6V0D2	ATPase, H+ transporting, lysosomal 38kDa, V0 subunit d2
18	Bt.48590	NM_001083653	ATP6V1C2	ATPase, H+ transporting, lysosomal 42kDa, V1 subunit C2
19	Bt.50607	NM_001079613	ATP6V1E2	ATPase, H+ transporting, lysosomal 31kDa, V1 subunit E2
20	N/A	XM_002694234	ATP6V1G3	ATPase, H+ transporting, lysosomal 13kDa, V1 subunit G3
21	Bt.5278	NM_001015671	BCS1L	BCS1-like (<i>S. cerevisiae</i>)
22	Bt.16025	NM_001001439	COX4I1	Cytochrome c oxidase subunit IV isoform 1
23	Bt.30618	NM_001193186	COX4I2	Cytochrome c oxidase subunit IV isoform 2
24	Bt.55686	NM_001002891	COX5A	COX5A protein
25	Bt.87845	NM_001034046	COX5B	Cytochrome c oxidase subunit Vb
26	Bt.49093	NM_174522	COX6A2	Cytochrome c oxidase subunit VIa polypeptide 2
27	Bt.67150	NM_176675	COX6B1	Cytochrome c oxidase subunit VIb polypeptide 1
28	Bt.29868	NM_001012684	COX6B2	Cytochrome c oxidase subunit VIb testes-specific isoform
29	Bt.4970	NM_175807	COX7A2	Cytochrome c oxidase subunit VIIa polypeptide 2 (liver)
30	Bt.49046	NM_001034695	COX7A2L	Cytochrome c oxidase subunit VIIa polypeptide 2 like
31	Bt.91777	NM_175795	COX7B	Cytochrome c oxidase subunit VIIb
32	Bt.1808	NM_001038090	CYC1	Cytochrome c-1
33	Bt.3399	NM_001080912	LHPP	Phospholysine phosphohistidine inorganic pyrophosphate phosphatase
34	Bt.4473	NM_176655	NDUFA10	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, 10, 42kDa
35	Bt.5723	NM_175718	NDUFA11	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, 11, 14.7kDa
36	Bt.65	NM_175815	NDUFA2	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, 2, 8kDa
37	Bt.66	NM_176659	NDUFA3	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, 3, 9kDa

Position	UniGene	GenBank	Symbol	Description
38	Bt.4819	NM_175820	NDUFA4	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, 4, 9kDa
39	Bt.60600	NM_175829	NDUFA5	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, 5, 13kDa
40	Bt.63	NM_175791	NDUFA6	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, 6, 14kDa
41	Bt.20	NM_176658	NDUFA7	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, 7, 14.5kDa
42	Bt.59	NM_175826	NDUFA8	NADH dehydrogenase (ubiquinone) 1 alpha subcomplex, 8, 19kDa
43	Bt.321	NM_001040488	NDUFAB1	NADH dehydrogenase (ubiquinone) 1, alpha/beta subcomplex, 1, 8kDa
44	Bt.70	NM_175818	NDUFB10	NADH dehydrogenase (ubiquinone) 1 beta subcomplex, 10, 22kDa
45	Bt.60	NM_175828	NDUFB2	NADH dehydrogenase (ubiquinone) 1 beta subcomplex, 2, 8kDa
46	Bt.61	NM_176667	NDUFB3	NADH dehydrogenase (ubiquinone) 1 beta subcomplex, 3, 12kDa
47	Bt.49223	NM_175822	NDUFB4	NADH dehydrogenase (ubiquinone) 1 beta subcomplex, 4, 15kDa
48	Bt.71	NM_176656	NDUFB5	NADH dehydrogenase (ubiquinone) 1 beta subcomplex, 5, 16kDa
49	Bt.893	NM_175787	NDUFB6	NADH dehydrogenase (ubiquinone) 1 beta subcomplex, 6, 17kDa
50	Bt.64	NM_176660	NDUFB7	NADH dehydrogenase (ubiquinone) 1 beta subcomplex, 7, 18kDa
51	Bt.57711	NM_174667	NDUFB8	NADH dehydrogenase (ubiquinone) 1 beta subcomplex, 8, 19kDa
52	Bt.3117	NM_175783	NDUFB9	NADH dehydrogenase (ubiquinone) 1 beta subcomplex, 9, 22kDa
53	Bt.98783	NM_174564	NDUFC1	NADH dehydrogenase (ubiquinone) 1, subcomplex unknown, 1, 6kDa
54	Bt.64366	NM_176642	NDUFC2	NADH dehydrogenase (ubiquinone) 1, subcomplex unknown, 2, 14.5kDa
55	Bt.4777	NM_174820	NDUF51	NADH dehydrogenase (ubiquinone) Fe-S protein 1, 75kDa (NADH-coenzyme Q reductase)
56	Bt.4475	NM_001075137	NDUF52	NADH dehydrogenase (ubiquinone) Fe-S protein 2, 49kDa (NADH-coenzyme Q reductase)
57	Bt.1153	NM_174819	NDUF53	NADH dehydrogenase (ubiquinone) Fe-S protein 3, 30kDa (NADH-coenzyme Q reductase)
58	Bt.58	NM_175800	NDUF54	NADH dehydrogenase (ubiquinone) Fe-S protein 4, 18kDa (NADH-coenzyme Q reductase)
59	Bt.57	NM_176652	NDUF55	NADH dehydrogenase (ubiquinone) Fe-S protein 5, 15kDa (NADH-coenzyme Q reductase)
60	Bt.56	NM_175810	NDUF56	NADH dehydrogenase (ubiquinone) Fe-S protein 6, 13kDa (NADH-coenzyme Q reductase)
61	Bt.315	NM_001038022	NDUF57	NADH dehydrogenase (ubiquinone) Fe-S protein 7, 20kDa (NADH-coenzyme Q reductase)
62	Bt.5483	NM_174818	NDUF58	NADH dehydrogenase (ubiquinone) Fe-S protein 8, 23kDa (NADH-coenzyme Q reductase)
63	Bt.4072	NM_174808	NDUFV1	NADH dehydrogenase (ubiquinone) flavoprotein 1, 51kDa
64	Bt.88596	NM_174565	NDUFV2	NADH dehydrogenase (ubiquinone) flavoprotein 2, 24kDa
65	Bt.43863	NM_175830	NDUFV3	NADH dehydrogenase (ubiquinone) flavoprotein 3, 10kDa
66	Bt.49117	NM_001035335	OXA1L	Oxidase (cytochrome c) assembly 1-like
67	Bt.7870	NM_001075118	PPA1	Pyrophosphatase (inorganic) 1
68	Bt.58443	NM_001076396	PPA2	Pyrophosphatase (inorganic) 2
69	Bt.24449	NM_174178	SDHA	Succinate dehydrogenase complex, subunit A, flavoprotein (Fp)
70	Bt.13128	NM_001040483	SDHB	Succinate dehydrogenase complex, subunit B, iron sulfur (Ip)
71	Bt.48821	NM_175814	SDHC	Succinate dehydrogenase complex, subunit C, integral membrane protein, 15kDa
72	Bt.65279	NM_174179	SDHD	Succinate dehydrogenase complex, subunit D, integral membrane protein
73	Bt.98828	NM_001046326	SLC25A15	Solute carrier family 25 (mitochondrial carrier; ornithine transporter) member 15
74	Bt.14112	NM_001015587	SLC25A21	Solute carrier family 25 (mitochondrial oxodicarboxylate carrier), member 21

Position	UniGene	GenBank	Symbol	Description
75	Bt.16050	NM_001075159	SLC25A22	Solute carrier family 25 (mitochondrial carrier: glutamate), member 22
76	Bt.507	NM_001166528	UCP1	Uncoupling protein 1 (mitochondrial, proton carrier)
77	Bt.5180	NM_001033611	UCP2	Uncoupling protein 2 (mitochondrial, proton carrier)
78	Bt.136	NM_174210	UCP3	Uncoupling protein 3 (mitochondrial, proton carrier)
79	Bt.5040	NM_174215	UQCR11	Ubiquinol-cytochrome c reductase (6.4kD) subunit
80	Bt.23164	NM_174629	UQCRC1	UQCRC1 protein
81	Bt.27799	NM_174630	UQCRC2	Ubiquinol-cytochrome c reductase core protein II
82	Bt.265	NM_174813	UQCRCF1	Ubiquinol-cytochrome c reductase, Rieske iron-sulfur polypeptide 1
83	Bt.27327	NM_001034745	UQCRH	Ubiquinol-cytochrome c reductase hinge protein
84	Bt.49658	NM_174805	UQCRCQ	Low molecular mass ubiquinone-binding protein (9.5kD)
85	Bt.14186	NM_173979	ACTB	Actin, beta
86	Bt.87389	NM_001034034	GAPDH	Glyceraldehyde-3-phosphate dehydrogenase
87	Bt.49238	NM_001034035	HPRT1	Hypoxanthine phosphoribosyltransferase 1
88	Bt.22662	NM_001075742	TBP	TATA box binding protein
89	Bt.111451	NM_174814	YWHAZ	Tyrosine 3-monooxygenase/tryptophan 5-monooxygenase activation protein, zeta polypeptide
90	N/A	SA_00137	BGDC	Cow Genomic DNA Contamination
91	N/A	SA_00104	RTC	Reverse Transcription Control
92	N/A	SA_00104	RTC	Reverse Transcription Control
93	N/A	SA_00104	RTC	Reverse Transcription Control
94	N/A	SA_00103	PPC	Positive PCR Control
95	N/A	SA_00103	PPC	Positive PCR Control
96	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 ROX [™] 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.

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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