

RT² Profiler PCR Array (384-Well Format)

Rat Molecular Toxicology PathwayFinder

Cat. no. 330231 PARN-3401ZE

For pathway expression analysis

Format	For use with the following real-time cyclers
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 G	Roche® LightCycler® 480 (384-well block)

Description

The Rat Molecular Toxicology PathwayFinder RT² Profiler™ PCR Array profiles the expression of 370 key genes in at least 13 different biological pathways activated in response to toxic drugs. Profiling the expression of these genes in human cell lines (such as hepatocytes) or organs (especially livers) of mice or rats treated with your candidate drugs can help indicate the toxicological responses that they induce. Understanding these mechanisms can then guide chemical modifications to avoid the observed toxic responses rather than completely dismissing a drug class otherwise effective at preventing or treating the target disease phenotype. All of the toxic response pathways represented by this array can be independent or interrelated. For example, inhibition of β -oxidation leads to steatosis, and uncoupling mitochondrial energy metabolism leads to apoptosis and necrosis. Drugs affecting reactive oxygen species metabolism or cellular redox status cause oxidative stress and induce antioxidant responses. These and other reactive drugs also directly damage DNA or inhibit its repair activating DNA damage signaling and DNA repair pathways or apoptosis and necrosis under more extreme conditions of prolonged exposure or excess DNA, cell or tissue damage. Interference with protein synthesis causes endoplasmic reticulum stress and activates the unfolded protein response up-regulating heat shock protein and chaperone gene expression. Increased expression of the cytochrome P450 and other phase I drug metabolism enzymes occur when drugs inhibit or overwhelm their chemical modification activates. More severe and complex phenomena result when drugs inhibit fatty acid and lipid metabolism (β -oxidation) including the lipid storage disorders of steatosis, cholestasis, and phospholipidosis. Toxic responses to drugs in immune system cells bring about immunotoxicity and immunosuppression. Using real-time PCR, you can easily and reliably analyze the expression of a focused panel of genes to determine which molecular toxicological

response pathways your drug candidates activate with this array. Once you have defined the pathways involved, perform comprehensive surveys of more genes in those pathways using other application-specific or custom PCR Arrays designed for individual pathways.

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



Shipping and storage

RT² Profiler PCR Arrays in formats E and G 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.

Gene table: RT² Profiler PCR Array

Position	UniGene	GenBank	Symbol	Description
A01	Rn.198671	NM_001100963	Aass	Aminoadipate-semialdehyde synthase
A02	Rn.14539	NM_031760	Abcb11	ATP-binding cassette, subfamily B (MDR/TAP), member 11
A03	Rn.154810	NM_133401	Abcb1a	ATP-binding cassette, sub-family B (MDR/TAP), member 1A
A04	Rn.144554	NM_012623	Abcb1b	ATP-binding cassette, subfamily B (MDR/TAP), member 1B
A05	Rn.82691	NM_012690	Abcb4	ATP-binding cassette, subfamily B (MDR/TAP), member 4
A06	Rn.10495	NM_022281	Abcc1	ATP-binding cassette, subfamily C (CFTR/MRP), member 1
A07	Rn.10265	NM_012833	Abcc2	ATP-binding cassette, subfamily C (CFTR/MRP), member 2
A08	Rn.205054	NM_080581	Abcc3	ATP-binding cassette, subfamily C (CFTR/MRP), member 3
A09	Rn.3105	NM_001100850	Abl1	C-abl oncogene 1, receptor tyrosine kinase
A10	Rn.8913	NM_012489	Acaa1a	Acetyl-Coenzyme A acyltransferase 1A
A11	Rn.3786	NM_130433	Acaa2	Acetyl-Coenzyme A acyltransferase 2
A12	Rn.44372	NM_022193	Acaca	Acetyl-coenzyme A carboxylase alpha
A13	Rn.8651	NM_001108181	Acad11	Acyl-Coenzyme A dehydrogenase family, member 11
A14	Rn.13649	NM_181768	Acad9	Acyl-Coenzyme A dehydrogenase family, member 9
A15	Rn.174	NM_012819	Acadl	Acyl-Coenzyme A dehydrogenase, long-chain
A16	Rn.6302	NM_016986	Acadm	Acyl-Coenzyme A dehydrogenase, C-4 to C-12 straight chain
A17	Rn.1167	NM_022512	Acads	Acyl-Coenzyme A dehydrogenase, C-2 to C-3 short chain
A18	Rn.44423	NM_013084	Acadsl	Acyl-Coenzyme A dehydrogenase, short/branched chain
A19	Rn.33319	NM_012891	Acadvl	Acyl-Coenzyme A dehydrogenase, very long chain
A20	Rn.4054	NM_017075	Acat1	Acetyl-coenzyme A acetyltransferase 1
A21	Rn.203063	NM_001006995	Acat3	Acetyl-Coenzyme A acetyltransferase 3
A22	Rn.29771	NM_016987	Acly	ATP citrate lyase
A23	Rn.35934	NM_017321	Aco1	Aconitase 1, soluble
A24	Rn.43737	NM_024398	Aco2	Aconitase 2, mitochondrial
B01	Rn.212205	NM_130747	Acot12	Acyl-CoA thioesterase 12
B02	Rn.37524	NM_138907	Acot2	Acyl-CoA thioesterase 2
B03	Rn.145093	NM_001108041	Acot3	Acyl-CoA thioesterase 3
B04	Rn.6024	NM_013214	Acot7	Acyl-CoA thioesterase 7
B05	Rn.161868	NM_130756	Acot8	Acyl-CoA thioesterase 8
B06	Rn.8792	NM_001013960	Acot9	Acyl-CoA thioesterase 9
B07	Rn.31796	NM_017340	Acox1	Acyl-Coenzyme A oxidase 1, palmitoyl
B08	Rn.10622	NM_145770	Acox2	Acyl-Coenzyme A oxidase 2, branched chain
B09	Rn.10546	NM_053339	Acox3	Acyl-Coenzyme A oxidase 3, pristanoyl
B10	Rn.6215	NM_012820	Acs1	Acyl-CoA synthetase long-chain family member 1
B11	Rn.40222	NM_019286	Adh1	Alcohol dehydrogenase 1 (class I)
B12	Rn.64165	NM_012895	Adk	Adenosine kinase
B13	Rn.91370	NM_013149	Ahr	Aryl hydrocarbon receptor
B14	Rn.32083	NM_012898	Ahsg	Alpha-2-HS-glycoprotein
B15	Rn.203165	NM_031356	Aifm1	Apoptosis-inducing factor, mitochondrion-associated 1
B16	Rn.11422	NM_033230	Akt1	V-akt murine thymoma viral oncogene homolog 1
B17	Rn.202968	NM_134326	Alb	Albumin
B18	Rn.6132	NM_022407	Aldh1a1	Aldehyde dehydrogenase 1 family, member A1
B19	Rn.101781	NM_032416	Aldh2	Aldehyde dehydrogenase 2 family (mitochondrial)
B20	Rn.64522	NM_023979	Apaf1	Apoptotic peptidase activating factor 1
B21	Rn.5949	NM_024148	Apex1	APEX nuclease (multifunctional DNA repair enzyme) 1
B22	Rn.48763	NM_080576	Apoa5	Apolipoprotein A-V
B23	Rn.32351	NM_138828	ApoE	Apolipoprotein E
B24	Rn.101696	NM_001024351	Apof	Apolipoprotein F
C01	Rn.90091	NM_012825	Aqp4	Aquaporin 4
C02	Rn.127798	NM_053407	Asah1	N-acylsphingosine amidohydrolase (acid ceramidase) 1

Position	UniGene	GenBank	Symbol	Description
C03	Rn.11172	NM_013079	Asns	Asparagine synthetase
C04	Rn.2423	NM_024403	Atf4	Activating transcription factor 4 (tax-responsive enhancer element B67)
C05	Rn.221907	NM_001107196	Atf6	Activating transcription factor 6
C06	Rn.214048	NM_001106821	Atm	Ataxia telangiectasia mutated homolog (human)
C07	Rn.205429	NM_212490	Atp6v1g2	ATPase, H+ transporting, lysosomal V1 subunit G2
C08	Rn.6957	NM_001106140	Atp8b1	ATPase, Class I, type 8B, member 1
C09	Rn.36696	NM_022698	Bad	BCL2-associated agonist of cell death
C10	Rn.14598	NM_053812	Bak1	BCL2-antagonist/killer 1
C11	Rn.10668	NM_017059	Bax	Bcl2-associated X protein
C12	Rn.9996	NM_016993	Bcl2	B-cell CLL/lymphoma 2
C13	Rn.10323	NM_031535	Bcl2l1	Bcl2-like 1
C14	Rn.82709	NM_022612	Bcl2l11	BCL2-like 11 (apoptosis facilitator)
C15	Rn.31142	NM_022684	Bid	BH3 interacting domain death agonist
C16	Rn.64578	NM_023987	Birc3	Baculoviral IAP repeat-containing 3
C17	Rn.54471	NM_022274	Birc5	Baculoviral IAP repeat-containing 5
C18	Rn.213264	NM_139258	Bmf	Bcl2 modifying factor
C19	Rn.48840	NM_012514	Brca1	Breast cancer 1
C20	Rn.103225	NM_031542	Brca2	Breast cancer 2
C21	Rn.11378	NM_016994	C3	Complement component 3
C22	Rn.10252	NM_057146	C9	Complement component 9
C23	Rn.974	NM_022399	Calr	Calreticulin
C24	Rn.37508	NM_012762	Casp1	Caspase 1
D01	Rn.1438	NM_022522	Casp2	Caspase 2
D02	Rn.10562	NM_012922	Casp3	Caspase 3
D03	Rn.53995	NM_022260	Casp7	Caspase 7
D04	Rn.54474	NM_022277	Casp8	Caspase 8
D05	Rn.32199	NM_031632	Casp9	Caspase 9, apoptosis-related cysteine peptidase
D06	Rn.3001	NM_012520	Cat	Catalase
D07	Rn.105569	NM_001013237	Cd19	CD19 molecule
D08	Rn.102418	NM_031561	Cd36	CD36 molecule (thrombospondin receptor)
D09	Rn.10748	NM_012705	Cd4	Cd4 molecule
D10	Rn.25180	NM_134360	Cd40	CD40 molecule, TNF receptor superfamily member 5
D11	Rn.44218	NM_053353	Cd40lg	CD40 ligand
D12	Rn.1120	NM_012924	Cd44	Cd44 molecule
D13	Rn.10138	NM_012926	Cd80	Cd80 molecule
D14	Rn.6734	NM_020081	Cd86	CD86 molecule
D15	Rn.10306	NM_031538	Cd8a	CD8a molecule
D16	Rn.10089	NM_080782	Cdkn1a	Cyclin-dependent kinase inhibitor 1A
D17	Rn.14535	NM_133586	Ces2c	Carboxylesterase 2C
D18	Rn.204752	NM_057138	Cflar	CASP8 and FADD-like apoptosis regulator
D19	Rn.33267	NM_080400	Chek1	CHK1 checkpoint homolog (S. pombe)
D20	Rn.163213	NM_053677	Chek2	CHK2 checkpoint homolog (S. pombe)
D21	Rn.17650	NM_001108762	Comm4	COMM domain containing 4
D22	Rn.220	NM_012531	Comt	Catechol-O-methyltransferase
D23	Rn.1745	NM_022503	Cox7a2	Cytochrome c oxidase subunit VIIa polypeptide 2
D24	Rn.2270	NM_134345	Cox8a	Cytochrome c oxidase subunit VIIa
E01	Rn.2856	NM_031559	Cpt1a	Carnitine palmitoyltransferase 1a, liver
E02	Rn.6028	NM_013200	Cpt1b	Carnitine palmitoyltransferase 1b, muscle
E03	Rn.11389	NM_012930	Cpt2	Carnitine palmitoyltransferase 2
E04	Rn.6249	NM_001004085	Crat	Carnitine acetyltransferase
E05	Rn.4896	NM_031987	Crot	Carnitine O-octanoyltransferase
E06	Rn.127769	NM_012534	Cryaa	Crystallin, alpha A
E07	Rn.98208	NM_012935	Cryab	Crystallin, alpha B
E08	Rn.66581	NM_130755	Cs	Citrate synthase
E09	Rn.44285	XM_340799	Csf2	Colony stimulating factor 2 (granulocyte-macrophage)
E10	Rn.100909	NM_022597	Ctsb	Cathepsin B
E11	Rn.92738	NM_012938	Ctse	Cathepsin E
E12	Rn.1413	NM_001130491	Cyc1	Cytochrome c-1
E13	Rn.128760	NM_001017380	Cyld	Cylindromatosis (turban tumor syndrome)
E14	Rn.10352	NM_012540	Cyp1a1	Cytochrome P450, family 1, subfamily a, polypeptide 1
E15	Rn.5563	NM_012541	Cyp1a2	Cytochrome P450, family 1, subfamily a, polypeptide 2
E16	Rn.91353	NM_001198676	Cyp2b2	Cytochrome P450, family 2, subfamily b, polypeptide 2
E17	Rn.10870	NM_019184	Cyp2c11	Cytochrome P450, subfamily 2, polypeptide 11
E18	Rn.185941	XM_001063361	Cyp2c37	Cytochrome P450, family 2, subfamily c, polypeptide 37
E19	Rn.26060	NM_138515	Cyp2d4	Cytochrome P450, family 2, subfamily d, polypeptide 4
E20	Rn.1372	NM_031543	Cyp2e1	Cytochrome P450, family 2, subfamily e, polypeptide 1
E21	Rn.202943	NM_153312	Cyp3a2	Cytochrome P450, family 3, subfamily a, polypeptide 2
E22	Rn.91120	NM_013105	Cyp3a23/3a1	Cytochrome P450, family 3, subfamily a, polypeptide 23/polypeptide 1
E23	Rn.33492	NM_175760	Cyp4a3	Cytochrome P450, family 4, subfamily a, polypeptide 3
E24	Rn.10737	NM_012942	Cyp7a1	Cytochrome P450, family 7, subfamily a, polypeptide 1

Position	UniGene	GenBank	Symbol	Description
F01	Rn.53969	NM_019138	Cyp7b1	Cytochrome P450, family 7, subfamily b, polypeptide 1
F02	Rn.11183	NM_024134	Ddit3	DNA-damage inducible transcript 3
F03	Rn.31800	NM_031810	Defb1	Defensin beta 1
F04	Rn.110990	NM_001014202	Der1l	Der1-like domain family, member 1
F05	Rn.9470	NM_001080148	Dhcr24	24-dehydrocholesterol reductase
F06	Rn.9090	NM_001008292	Diablo	Diablo homolog (Drosophila)
F07	Rn.15413	NM_031025	Dlat	Dihydrolipoamide S-acetyltransferase
F08	Rn.86962	NM_199385	Dld	Dihydrolipoamide dehydrogenase
F09	Rn.99702	NM_001006981	Dlst	Dihydrolipoamide S-succinyltransferase (E2 component of 2-oxo-glutarate complex)
F10	Rn.64562	NM_022934	Dnaja1	DnaJ (Hsp40) homolog, subfamily A, member 1
F11	Rn.3904	NM_032079	Dnaja2	DnaJ (Hsp40) homolog, subfamily A, member 2
F12	Rn.198254	NM_001038595	Dnaja3	DnaJ (Hsp40) homolog, subfamily A, member 3
F13	Rn.128947	NM_001108441	Dnajb1	DnaJ (Hsp40) homolog, subfamily B, member 1
F14	Rn.129050	NM_001013209	Dnajb6	DnaJ (Hsp40) homolog, subfamily B, member 6
F15	Rn.162234	NM_022232	Dnajc3	DnaJ (Hsp40) homolog, subfamily C, member 3
F16	Rn.100120	NM_024161	Dnajc5	DnaJ (Hsp40) homolog, subfamily C, member 5
F17	Rn.23812	NM_001107949	Dnajc6	DnaJ (Hsp40) homolog, subfamily C, member 6
F18	Rn.10354	NM_080689	Dnm1	Dynamin 1
F19	Rn.10503	NM_012933	Dpysl4	Dihydropyrimidinase-like 4
F20	Rn.162682	NM_153739	Duox1	Dual oxidase 1
F21	Rn.55542	NM_024141	Duox2	Dual oxidase 2
F22	Rn.6847	NM_078623	Echs1	Enoyl Coenzyme A hydratase, short chain, 1, mitochondrial
F23	Rn.8162	XM_238366	Edem1	ER degradation enhancer, mannosidase alpha-like 1
F24	Rn.3671	NM_133606	Ehhadh	Enoyl-Coenzyme A, hydratase/3-hydroxyacyl Coenzyme A dehydrogenase
G01	Rn.24897	NM_031599	Eif2ak3	Eukaryotic translation initiation factor 2 alpha kinase 3
G02	Rn.4236	NM_012554	Eno1	Enolase 1, (alpha)
G03	Rn.12447	XM_576312	Ep300	E1A binding protein p300
G04	Rn.3603	NM_012844	Ephx1	Epoxide hydrolase 1, microsomal
G05	Rn.17695	NM_001107037	Epx	Eosinophil peroxidase
G06	Rn.7320	NM_001106228	Ercc1	Excision repair cross-complementing rodent repair deficiency, complementation group 1
G07	Rn.74906	NM_001172809	Ercc2	Excision repair cross-complementing rodent repair deficiency, complementation group 2
G08	Rn.44012	NM_001031644	Ercc3	Excision repair cross-complementing rodent repair deficiency, complementation group 3
G09	Rn.208330	NM_001106910	Ercc5	Excision repair cross-complementing rodent repair deficiency, complementation group 5
G10	Rn.19370	NM_001107296	Ercc6	Excision repair cross-complementing rodent repair deficiency, complementation group 6
G11	Rn.218563	NM_001108919	Ern2	Endoplasmic reticulum to nucleus signaling 2
G12	Rn.64648	NM_138528	Ero1l	ERO1-like (S. cerevisiae)
G13	Rn.3682	NM_001106051	Esd	Esterase D/formylglutathione hydrolase
G14	Rn.10595	NM_012689	Esr1	Estrogen receptor 1
G15	Rn.54498	NM_022924	F2	Coagulation factor II (thrombin)
G16	Rn.36412	NM_012556	Fabp1	Fatty acid binding protein 1, liver
G17	Rn.16183	NM_152937	Fadd	Fas (TNFRSF6)-associated via death domain
G18	Rn.162521	NM_139194	Fas	Fas (TNF receptor superfamily, member 6)
G19	Rn.9725	NM_012908	Faslg	Fas ligand (TNF superfamily, member 6)
G20	Rn.9486	NM_017332	Fasn	Fatty acid synthase
G21	Rn.57325	NM_138917	Fbxo6	F-box protein 6
G22	Rn.29782	NM_017005	Fh1	Fumarate hydratase 1
G23	Rn.3928	NM_144737	Fmo2	Flavin containing monooxygenase 2
G24	Rn.163228	NM_053433	Fmo3	Flavin containing monooxygenase 3
H01	Rn.216582	NM_144562	Fmo4	Flavin containing monooxygenase 4
H02	Rn.7038	NM_144739	Fmo5	Flavin containing monooxygenase 5
H03	Rn.32116	NM_001105776	Foxi1	Forkhead box I1
H04	Rn.13451	NM_053371	Fxc1	Fractured callus expressed transcript 1
H05	Rn.10250	NM_024127	Gadd45a	Growth arrest and DNA-damage-inducible, alpha
H06	Rn.30048	NM_031796	Galnt5	UDP-N-acetyl-alpha-D-galactosamine:polypeptide N-acetylgalactosaminyltransferase 5 (GalNAc-T5)
H07	Rn.99039	NM_001108896	Gcdh	Glutaryl-Coenzyme A dehydrogenase
H08	Rn.44452	NM_022215	Gpd1	Glycerol-3-phosphate dehydrogenase 1 (soluble)
H09	Rn.6318	NM_031039	Gpt	Glutamic-pyruvate transaminase (alanine aminotransferase)
H10	Rn.11323	NM_030826	Gpx1	Glutathione peroxidase 1
H11	Rn.3503	NM_183403	Gpx2	Glutathione peroxidase 2
H12	Rn.108074	NM_022525	Gpx3	Glutathione peroxidase 3
H13	Rn.3647	NM_017165	Gpx4	Glutathione peroxidase 4
H14	Rn.218434	NM_001105738	Gpx5	Glutathione peroxidase 5
H15	Rn.9852	NM_147165	Gpx6	Glutathione peroxidase 6
H16	Rn.4130	NM_001106673	Gpx7	Glutathione peroxidase 7

Position	UniGene	GenBank	Symbol	Description
H17	Rn.3360	NM_030846	Grb2	Growth factor receptor bound protein 2
H18	Rn.120929	NM_001009920	Gsta5	Glutathione S-transferase Yc2 subunit
H19	Rn.209043	NM_001024304	Gstm4	Glutathione S-transferase mu 4
H20	Rn.48675	NM_020076	Haa0	3-hydroxyanthranilate 3,4-dioxygenase
H21	Rn.3340	NM_130826	Hadha	Hydroxyacyl-Coenzyme A dehydrogenase/3-ketoacyl-Coenzyme A thiolase/enoyl-Coenzyme A hydratase (trifunctional protein), alpha subunit
H22	Rn.11253	NM_133618	Hadhb	Hydroxyacyl-Coenzyme A dehydrogenase/3-ketoacyl-Coenzyme A thiolase/enoyl-Coenzyme A hydratase (trifunctional protein), beta subunit
H23	Rn.4028	NM_053523	Herpud1	Homocysteine-inducible, endoplasmic reticulum stress-inducible, ubiquitin-like domain member 1
H24	Rn.11139	NM_017112	Hpn	Hepsin
I01	Rn.2380	NM_053318	Hpx	Hemopexin
I02	Rn.16100	NM_133428	Hrg	Histidine-rich glycoprotein
I03	Rn.20418	NM_024393	Hsf1	Heat shock transcription factor 1
I04	Rn.163428	NM_031694	Hsf2	Heat shock transcription factor 2
I05	Rn.119867	NM_175761	Hsp90aa1	Heat shock protein 90, alpha (cytosolic), class A member 1
I06	Rn.98667	NM_001004082	Hsp90ab1	Heat shock protein 90 alpha (cytosolic), class B member 1
I07	Rn.101146	NM_001012197	Hsp90b1	Heat shock protein 90, beta, member 1
I08	Rn.1950	NM_031971	Hspa1a	Heat shock 70kD protein 1A
I09	Rn.187184	NM_212546	Hspa1l	Heat shock protein 1-like
I10	Rn.211303	NM_021863	Hspa2	Heat shock protein 2
I11	Rn.163092	NM_153629	Hspa4	Heat shock protein 4
I12	Rn.11088	NM_013083	Hspa5	Heat shock protein 5
I13	Rn.7535	NM_001100658	Hspa9	Heat shock protein 9
I14	Rn.3841	NM_031970	Hspb1	Heat shock protein 1
I15	Rn.22486	NM_130431	Hspb2	Heat shock protein beta 2
I16	Rn.3201	NM_138887	Hspb6	Heat shock protein, alpha-crystallin-related, B6
I17	Rn.21809	NM_031607	Hspb7	Heat shock protein family, member 7 (cardiovascular)
I18	Rn.102906	NM_053612	Hspb8	Heat shock protein B8
I19	Rn.37915	NM_134419	Hspbap1	Hspb associated protein 1
I20	Rn.102058	NM_022229	Hspd1	Heat shock protein 1 (chaperonin)
I21	Rn.106093	NM_012966	Hspe1	Heat shock protein 1 (chaperonin 10)
I22	Rn.37805	NM_001011901	Hsph1	Heat shock 105/110 protein 1
I23	Rn.107325	NM_001106599	Htra2	Htra serine peptidase 2
I24	Rn.163330	NM_001107321	Htra4	Htra serine peptidase 4
J01	Rn.12	NM_012967	Icam1	Intercellular adhesion molecule 1
J02	Rn.3561	NM_031510	Idh1	Isocitrate dehydrogenase 1 (NADP+), soluble
J03	Rn.3490	NM_001014161	Idh2	Isocitrate dehydrogenase 2 (NADP+), mitochondrial
J04	Rn.95104	NM_053638	Idh3a	Isocitrate dehydrogenase 3 (NAD+) alpha
J05	Rn.1093	NM_053581	Idh3b	Isocitrate dehydrogenase 3 (NAD+) beta
J06	Rn.2837	NM_031551	Idh3g	Isocitrate dehydrogenase 3 (NAD), gamma
J07	Rn.196548	NM_001014786	Ifna1	Interferon-alpha 1
J08	Rn.10795	NM_138880	Ifng	Interferon gamma
J09	Rn.9868	NM_012854	Il10	Interleukin 10
J10	Rn.9921	NM_053828	Il13	Interleukin 13
J11	Rn.12300	NM_017019	Il1a	Interleukin 1 alpha
J12	Rn.9869	NM_031512	Il1b	Interleukin 1 beta
J13	Rn.9871	NM_053836	Il2	Interleukin 2
J14	Rn.9872	NM_013163	Il2ra	Interleukin 2 receptor, alpha
J15	Rn.108255	NM_201270	Il4	Interleukin 4
J16	Rn.44227	NM_021834	Il5	Interleukin 5
J17	Rn.9873	NM_012589	Il6	Interleukin 6
J18	Rn.30020	NM_031815	Inhbe	Inhibin beta E
J19	Rn.215658	XM_001080404	Itgax	Integrin, alpha X
J20	Rn.88804	NM_019147	Jag1	Jagged 1
J21	Rn.20530	NM_022929	Kcnip1	Kv channel-interacting protein 1
J22	Rn.23089	NM_001107164	Klf1	Kruppel-like factor 1 (erythroid)
J23	Rn.219326	NM_001106095	Lig4	Ligase IV, DNA, ATP-dependent
J24	Rn.44161	NM_001002016	Lmna	Lamin A
K01	Rn.3834	NM_012598	Lpl	Lipoprotein lipase
K02	Rn.10211	NM_031049	Lss	Lanosterol synthase (2,3-oxidosqualene-lanosterol cyclase)
K03	Rn.83100	NM_001130552	Ly6d	Lymphocyte antigen 6 complex, locus D
K04	Rn.2283	NM_012771	Lyz2	Lysozyme 2
K05	Rn.87331	NM_017190	Mag	Myelin-associated glycoprotein
K06	Rn.20578	NM_001031655	Manba	Mannosidase, beta A, lysosomal
K07	Rn.163443	NM_033653	Maoa	Monoamine oxidase A
K08	Rn.6656	NM_013198	Maob	Monoamine oxidase B
K09	Rn.4090	XM_341399	Mapk8	Mitogen-activated protein kinase 8
K10	Rn.2362	NM_053569	Mbtps1	Membrane-bound transcription factor peptidase, site 1
K11	Rn.212224	NM_001035007	Mbtps2	Membrane-bound transcription factor peptidase, site 2
K12	Rn.129914	NM_021846	Mcl1	Myeloid cell leukemia sequence 1

Position	UniGene	GenBank	Symbol	Description
K13	Rn.13492	NM_033235	Mdh1	Malate dehydrogenase 1, NAD (soluble)
K14	Rn.102913	NM_001108221	Mdh1b	Malate dehydrogenase 1B, NAD (soluble)
K15	Rn.1011	NM_031151	Mdh2	Malate dehydrogenase 2, NAD (mitochondrial)
K16	Rn.91829	NM_001108099	Mdm2	Mdm2 p53 binding protein homolog (mouse)
K17	Rn.9836	NM_012861	Mgmt	O-6-methylguanine-DNA methyltransferase
K18	Rn.73551	XM_225460	Mki67	Antigen identified by monoclonal antibody Ki-67
K19	Rn.20391	NM_031053	Mlh1	MutL homolog 1 (E. coli)
K20	Rn.16914	NM_001034112	Mlx	MAX-like protein X
K21	Rn.47782	NM_001107036	Mpo	Myeloperoxidase
K22	Rn.114	NM_212534	Mrps18b	Mitochondrial ribosomal protein S18B
K23	Rn.3174	NM_031058	Msh2	MutS homolog 2 (E. coli)
K24	Rn.81556	NM_001107727	Mtp	Microsomal triglyceride transfer protein
L01	Rn.25214	NM_138873	Nbn	Nibrin
L02	Rn.2411	XM_342346	Nfkb1	Nuclear factor of kappa light polypeptide gene enhancer in B-cells 1
L03	Rn.144645	NM_080577	Nploc4	Nuclear protein localization 4 homolog (S. cerevisiae)
L04	Rn.11234	NM_017000	Nqo1	NAD(P)H dehydrogenase, quinone 1
L05	Rn.10712	NM_057133	NrOb2	Nuclear receptor subfamily 0, group B, member 2
L06	Rn.42943	NM_021745	Nr1h4	Nuclear receptor subfamily 1, group H, member 4
L07	Rn.42941	NM_021742	Nr5a2	Nuclear receptor subfamily 5, group A, member 2
L08	Rn.1492	NM_053463	Nucb1	Nucleobindin 1
L09	Rn.10669	NM_057120	Nudt1	Nudix (nucleoside diphosphate linked moiety X)-type motif 1
L10	Rn.144747	NM_001106049	Nudt15	Nudix (nucleoside diphosphate linked moiety X)-type motif 15
L11	Rn.3189	NM_053322	Nup210	Nucleoporin 210
L12	Rn.38202	NM_001106062	Ogdhl	Oxoglutarate dehydrogenase-like
L13	Rn.22623	NM_030870	Ogg1	8-oxoguanine DNA glycosylase
L14	Rn.141867	NM_001000159	Olr128	Olfactory receptor 128
L15	Rn.142343	NM_001000080	Olr1583	Olfactory receptor 1583
L16	Rn.1579	NM_001007265	Os9	Osteosarcoma amplified 9
L17	Rn.19056	NM_001107087	Ostalpha	Organic solute transporter alpha
L18	Rn.11327	NM_013063	Parp1	Poly (ADP-ribose) polymerase 1
L19	Rn.22730	NM_001106030	Parp2	Poly (ADP-ribose) polymerase 2
L20	Rn.6033	NM_019330	Pcca	Propionyl-coenzyme A carboxylase, alpha polypeptide
L21	Rn.223	NM_022381	Pcna	Proliferating cell nuclear antigen
L22	Rn.44471	NM_019374	Pdyn	Prodynorphin
L23	Rn.3401	NM_001106794	Pfdn5	Prefoldin subunit 5
L24	Rn.20732	NM_032077	Pon1	Paraoxonase 1
M01	Rn.11359	NM_031576	Por	P450 (cytochrome) oxidoreductase
M02	Rn.11354	NM_138837	Pou3f3	POU class 3 homeobox 3
M03	Rn.9753	NM_013196	Ppara	Peroxisome proliferator activated receptor alpha
M04	Rn.23443	NM_013124	Pparg	Peroxisome proliferator-activated receptor gamma
M05	Rn.19172	NM_031347	Ppargc1a	Peroxisome proliferator-activated receptor gamma, coactivator 1 alpha
M06	Rn.1463	NM_017101	Ppia	Peptidylprolyl isomerase A (cyclophilin A)
M07	Rn.78049	NM_001107175	Ppp1r15b	Protein phosphatase 1, regulatory (inhibitor) subunit 15b
M08	Rn.2845	NM_057114	Prdx1	Peroxiredoxin 1
M09	Rn.2511	NM_017169	Prdx2	Peroxiredoxin 2
M10	Rn.42	NM_053576	Prdx6	Peroxiredoxin 6
M11	Rn.104417	NM_001106806	Prkcsh	Protein kinase C substrate 80K-H
M12	Rn.24110	NM_001108327	Prkdc	Protein kinase, DNA activated, catalytic polypeptide
M13	Rn.44369	NM_017232	Ptgs2	Prostaglandin-endoperoxide synthase 2
M14	Rn.90166	NM_001109887	Ptprc	Protein tyrosine phosphatase, receptor type, C
M15	Rn.10677	NM_017076	Pvr	Poliovirus receptor
M16	Rn.7929	NM_001107687	Rab25	RAB25, member RAS oncogene family
M17	Rn.214052	NM_001109204	Rad51	RAD51 homolog (RecA homolog, E. coli) (S. cerevisiae)
M18	Rn.203261	NM_001005889	Rdx	Radixin
M19	Rn.16746	NM_144741	Retn	Resistin
M20	Rn.83717	NM_001014072	RGD131151 7	Similar to RIKEN cDNA 9430015G10
M21	Rn.4224	NM_013067	Rpn1	Ribophorin I
M22	Rn.33311	NM_001008884	RT1-Db1	RT1 class II, locus Db1
M23	Rn.31839	NM_053822	S100a8	S100 calcium binding protein A8
M24	Rn.7167	NM_080886	Sc4mol	Sterol-C4-methyl oxidase-like
N01	Rn.1023	NM_139192	Scd1	Stearoyl-Coenzyme A desaturase 1
N02	Rn.101725	NM_130428	SdhA	Succinate dehydrogenase complex, subunit A, flavoprotein (Fp)
N03	Rn.3902	NM_001100539	Sdhb	Succinate dehydrogenase complex, subunit B, iron sulfur (Ip)
N04	Rn.1698	NM_001005534	Sdhc	Succinate dehydrogenase complex, subunit C, integral membrane protein
N05	Rn.3040	NM_198788	SdhD	Succinate dehydrogenase complex, subunit D, integral membrane protein
N06	Rn.98327	NM_001034129	Sec62	SEC62 homolog (S. cerevisiae)
N07	Rn.20802	NM_177933	Sel1l	Sel-1 suppressor of lin-12-like (C. elegans)
N08	Rn.4197	NM_173120	Sels	Selenoprotein S
N09	Rn.2119	NM_030835	Serp1	Stress-associated endoplasmic reticulum protein 1
N10	Rn.91257	NM_012657	Serpina3k	Serine (or cysteine) peptidase inhibitor, clade A, member 3K

Position	UniGene	GenBank	Symbol	Description
N11	Rn.202939	NM_031531	Serpina3n	Serine (or cysteine) peptidase inhibitor, clade A, member 3N
N12	Rn.9913	NM_017047	Slc10a1	Solute carrier family 10 (sodium/bile acid cotransporter family), member 1
N13	Rn.95055	NM_017102	Slc2a3	Solute carrier family 2 (facilitated glucose transporter), member 3
N14	Rn.5641	NM_131906	Slco1a4	Solute carrier organic anion transporter family, member 1a4
N15	Rn.18277	NM_001006997	Smpd1	Sphingomyelin phosphodiesterase 1, acid lysosomal
N16	Rn.6059	NM_017050	Sod1	Superoxide dismutase 1, soluble
N17	Rn.201291	NM_053675	Spata2	Spermatogenesis associated 2
N18	Rn.221929	XM_213329	Srebf1	Sterol regulatory element binding transcription factor 1
N19	Rn.1935	NM_001013988	Stbd1	Starch binding domain 1
N20	Rn.62159	NM_001108387	Suc1a2	Succinate-CoA ligase, ADP-forming, beta subunit
N21	Rn.3766	NM_053752	Suc1g1	Succinate-CoA ligase, alpha subunit
N22	Rn.202591	NM_001100750	Suc1g2	Succinate-CoA ligase, GDP-forming, beta subunit
N23	Rn.14527	NM_130735	Sycp2	Synaptonemal complex protein 2
N24	Rn.216272	NM_001033680	Syt1	Synaptotagmin I
O01	Rn.162486	NM_001100739	Syvn1	Synovial apoptosis inhibitor 1, synoviolin
O02	Rn.34397	NM_031549	Tagln	Transgelin
O03	Rn.7102	NM_012670	Tcp1	T-complex 1
O04	Rn.87477	NM_013042	Tff3	Trefoil factor 3, intestinal
O05	Rn.40136	NM_021578	Tgfb1	Transforming growth factor, beta 1
O06	Rn.214009	NM_001025699	Tmem57	Transmembrane protein 57
O07	Rn.2275	NM_012675	Tnf	Tumor necrosis factor (TNF superfamily, member 2)
O08	Rn.105558	NM_001108873	Tnfrsf10b	Tumor necrosis factor receptor superfamily, member 10b
O09	Rn.111119	NM_013091	Tnfrsf1a	Tumor necrosis factor receptor superfamily, member 1a
O10	Rn.11322	NM_019135	Tnfrsf8	Tumor necrosis factor receptor superfamily, member 8
O11	Rn.83627	NM_145681	Tnfrsf10	Tumor necrosis factor (ligand) superfamily, member 10
O12	Rn.54443	NM_030989	Tp53	Tumor protein p53
O13	Rn.91199	NM_019353	Tpo	Thyroid peroxidase
O14	Rn.2758	NM_001008767	Txnip	Thioredoxin interacting protein
O15	Rn.7305	NM_001013891	Txn14b	Thioredoxin-like 4B
O16	Rn.6300	NM_022584	Txnrd2	Thioredoxin reductase 2
O17	Rn.139603	NM_001106380	Ube2g2	Ubiquitin-conjugating enzyme E2G 2 (UBC7 homolog, yeast)
O18	Rn.106299	NM_001007655	Ube2j2	Ubiquitin-conjugating enzyme E2, J2 (UBC6 homolog, yeast)
O19	Rn.23446	NM_001108251	Ubqln2	Ubiquilin 2
O20	Rn.2022	NM_001012025	Ubxn4	UBX domain protein 4
O21	Rn.10281	NM_012682	Ucp1	Uncoupling protein 1 (mitochondrial, proton carrier)
O22	Rn.13333	NM_019354	Ucp2	Uncoupling protein 2 (mitochondrial, proton carrier)
O23	Rn.9902	NM_013167	Ucp3	Uncoupling protein 3 (mitochondrial, proton carrier)
O24	Rn.26489	NM_012683	Ugt1a1	UDP glucuronosyltransferase 1 family, polypeptide A1
P01	Rn.138121	NM_022228	Ugt2a1	UDP glucuronosyltransferase 2 family, polypeptide A1
P02	Rn.9969	NM_173295	Ugt2b1	UDP glucuronosyltransferase 2 family, polypeptide B1
P03	Rn.11330	NM_053768	Uox	Urate oxidase
P04	Rn.98891	NM_053864	Vcp	Valosin-containing protein
P05	Rn.203725	NM_001127297	Wipi1	WD repeat domain, phosphoinositide interacting 1
P06	Rn.101044	NM_001004210	Xbp1	X-box binding protein 1
P07	Rn.91239	NM_022231	Xiap	X-linked inhibitor of apoptosis
P08	Rn.22820	NM_001107874	Xpc	Xeroderma pigmentosum, complementation group C
P09	Rn.13754	NM_053435	Xrcc1	X-ray repair complementing defective repair in Chinese hamster cells 1
P10	Rn.52078	NM_177419	Xrcc5	X-ray repair complementing defective repair in Chinese hamster cells 5
P11	Rn.94978	NM_031144	Actb	Actin, beta
P12	Rn.1868	NM_012512	B2m	Beta-2 microglobulin
P13	Rn.47	NM_012583	Hprt1	Hypoxanthine phosphoribosyltransferase 1
P14	Rn.107896	NM_017025	Ldha	Lactate dehydrogenase A
P15	Rn.973	NM_001007604	Rplp1	Ribosomal protein, large, P1
P16	N/A	U26919	RGDC	Rat Genomic DNA Contamination
P17	N/A	U26919	RGDC	Rat Genomic DNA Contamination
P18	N/A	U26919	RGDC	Rat Genomic DNA Contamination
P19	N/A	SA_00104	RTC	Reverse Transcription Control
P20	N/A	SA_00104	RTC	Reverse Transcription Control
P21	N/A	SA_00104	RTC	Reverse Transcription Control
P22	N/A	SA_00103	PPC	Positive PCR Control
P23	N/A	SA_00103	PPC	Positive PCR Control
P24	N/A	SA_00103	PPC	Positive PCR Control

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RT ² SYBR Green qPCR Mastermix (8)*	For 4 x 384 assays in 384-well plates; suitable for use with real-time cyclers that do not require a reference dye, including: Bio-Rad model CFX384; Roche LightCycler 480 (384-well); all other cyclers	330501
RT ² SYBR Green ROX [™] qPCR Mastermix (8)*	For 4 x 384 assays in 384-well plates; suitable for use with the following real-time cyclers: Applied Biosystems models 7900HT, ViiA 7 (384-well blocks)	330521
RT ² SYBR Green Fluor qPCR Mastermix (8)*	For 4 x 384 assays in 384-well plates; suitable for use with the following real-time cyclers: Bio-Rad models iCycler [®] , iQ [™] 5, MyiQ [™] , MyiQ2	330511

* Larger kit sizes available; please inquire.

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