

# RT<sup>2</sup> Profiler™ PCR Array:

## Mouse Apoptosis

### Catalog Number

PAMM-012A

PAMM-012C

PAMM-012D

PAMM-012E

PAMM-012F

PAMM-012G

### For Real-Time Instruments:

ABI Standard Blocks; Bio-Rad iCycler, MyiQ, and (MJ Research) Chromo 4; and Stratagene Mx3005p, Mx3000p

ABI 7500 and 7900HT FAST 96-Well Blocks, ABI StepOnePlus

Bio-Rad (MJ Research) Opticon and Opticon 2, Stratagene Mx4000

ABI 7900HT 384-Well Block

Roche LightCycler 480 96-well Block

Roche LightCycler 480 384-well Block

### Description

The Mouse Apoptosis RT<sup>2</sup> Profiler PCR Array profiles the expression of 84 key genes involved in apoptosis, or programmed cell death. The array includes the TNF ligands and their receptors; members of the bcl-2, caspase, IAP, TRAF, CARD, death domain, death effector domain, and CIDE families; as well as genes involved in the p53 and ATM pathways. Using real-time PCR, you can easily and reliably analyze expression of a focused panel of genes related to apoptosis with this array.

### Functional Gene Groupings

**TNF Ligand Family:** FasL (Tnfsf6), Tnf, Tnfsf10, Tnfsf12, Cd40lg, Cd70.

**TNF Receptor Family:** Fas (Tnfrsf6), Ltbr, Tnfrsf10b, Tnfrsf11b, Tnfrsf1a, Cd40.

**Bcl-2 Family:** Bad (Bbc2), Bag1, Bag3, Bak1, Bax, Bcl2, Bcl2l1, Bcl2l2, Bcl2l10, Bid, Bnip2, Bnip3, Bnip3l, Bok, Mcl1.

**Caspase Family:** Casp1, Casp2, Casp3, Casp4, Casp6, Casp7, Casp8, Casp9, Casp12, Casp14.

**IAP Family:** Birc1a, Birc1b, Birc2, Birc3, Birc4, Birc5.

**TRAF Family:** Traf1, Traf2, Traf3.

**CARD Family:** Apaf1, Bcl10, Birc3, Birc4, Nod1, Card6, Card10, Casp1, Casp2, Casp4, Casp9, Cradd, Nol3, Pycard (Asc), Ripk1.

**Death Domain Family:** Cradd, Dapk1, Fadd, Fas (Tnfrsf6), Ripk1, Tnfrsf10b (TRAIL-R), Tnfrsf11b, Tnfrsf1a.

**Death Effector Domain Family:** Casp8, Cflar (Cash), Fadd.

**CIDE Domain Family:** Cidea, Cideb, Dffa, Dffb.

**p53 and DNA Damage-Induced Apoptosis:** Akt1, Apaf1, Bad (Bbc2), Bax, Bcl2, Bcl2l1, Bid, Casp3, Casp6, Casp7, Casp9, Trp53 (p53), Trp53bp2, Trp53inp1, Trp63, Trp73.

**Anti-Apoptosis:** Akt1, Api5, Atf5, Bag1, Bag3, Bcl2, Bcl2l1, Bcl2l10, Bcl2l2, Birc1a, Birc1b, Birc2, Birc3, Birc4, Birc5, Bnip2, Bnip3, Casp2, Cflar, Dad1, Tsc22d3, Fas (Tnfrsf6), Hells, Il10, Lhx4, Mcl1, Nfkb1, Nme5, Pak7 (Arc), Pim2, Polb, Prdx2, Rnf7, Sphk2, Tnf, Cd40lg (CD40L), Zc3hc1 (Nipa).

## Product Specification Sheet

### Storage Conditions

Please check the kit components immediately after you receive this package. We are only responsible for missing items reported within two (2) business days of receipt.

**Storage Conditions:** PCR Arrays are shipped at ambient temperature. Keep plates at -20 °C for long-term storage.

**NOTE:** Be sure that you have the correct PCR Array format for your instrument before starting the experiment.

### References

1. Green, DR. (2000) Apoptotic Pathways: Paper Wraps Stone Blunts Scissors. *Cell* **102**: 1-4.
2. Salvesen GS, Dixit VM. (1999) Caspase Activation: The Induced-Proximity Model. *PNAS* **96**: 10964-7.
3. Nagata S (1999) Fas Ligand-Induced Apoptosis. *Annu Rev Genet* **33**: 29-55.
4. Budihardjo I, Oliver H, Lutter M, Luo X, Wang X. (1999) Biochemical Pathways Of Caspase Activation During Apoptosis. *Annu Rev Cell Dev Biol* **15**: 269-90.
5. Ekert PG, Silke J, Vaux DL (1999) Caspase Inhibitors. *Cell Death Differ* **6**(11): 1081-6
6. Lutz RJ (2000) Role Of The BH3 (Bcl-2 Homology 3) Domain In The Regulation Of Apoptosis And Bcl-2-Related Proteins. *Biochem Soc Trans* **28** (2): 51-6.
7. Inoue Ji, Ishida T, Tsukamoto N, Kobayashi N, Naito A, Azuma S, Yamamoto T. (2000) Tumor Necrosis Factor Receptor-Associated Factor (TRAF) Family: Adapter Proteins That Mediate Cytokine Signaling. *Exp Cell Res* **254**(1): 14-24.
8. Deveraux QL, Stennicke HR, Salvesen GS, Reed JC (1999) Endogenous Inhibitors Of Caspases. *J Clin Immunol* **19**(6): 388-98.
9. Orlinick JR, Chao MV. (1998) TNF-Related Ligands And Their Receptors. *Cell Signal* **10**(8): 543-51.
10. Schulze-Osthoff K, Ferrari D, Los M, Wesselborg S, Peter ME (1998) Apoptosis Signaling By Death Receptors. *Eur J Biochem* **254**(3): 439-59.
11. Singh A, Ni J, Aggarwal BB (1998) Death Domain Receptors And Their Role In Cell Demise. *J Interferon Cytokine Res* **18**(7): 439-50.

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### Array Layout: Mouse Apoptosis PCR Array

	1	2	3	4	5	6	7	8	9	10	11	12
A	Akt1	Apaf1	Api5	Atf5	Bad	Bag1	Bag3	Bak1	Bax	Bcl10	Bcl2	Bcl2l1
B	Bcl2l10	Bcl2l2	Bid	Birc1a	Birc1b	Birc2	Birc3	Birc4	Birc5	Bnip2	Bnip3	Bnip3l
C	Bok	Card10	Nod1	Card6	Casp1	Casp12	Casp14	Casp2	Casp3	Casp4	Casp6	Casp7
D	Casp8	Casp9	Cflar	Cidea	Cideb	Cradd	Dad1	Dapk1	Dffa	Dffb	Tsc22d3	Fadd
E	Fas	Fasl	Hells	Il10	Lhx4	Ltbr	Mcl1	Nfkb1	Nme5	Nol3	Pak7	Pim2
F	Polb	Prdx2	Pycard	Ripk1	Rnf7	Sphk2	Tnf	Tnfrsf10b	Tnfrsf11b	Tnfrsf1a	Cd40	Tnfsf10
G	Tnfsf12	Cd40lg	Cd70	Traf1	Traf2	Traf3	Trp53	Trp53bp2	Trp53inp1	Trp63	Trp73	Zc3hc1
H	Gusb	Hprt1	Hsp90ab1	Gapdh	Actb	MGDC	RTC	RTC	RTC	PPC	PPC	PPC

### Gene Table

Position	UniGene	GenBank	Symbol	Description
A01	Mm.6645	NM_009652	Akt1	Thymoma viral proto-oncogene 1
A02	Mm.220289	NM_009684	Apaf1	Apoptotic peptidase activating factor 1
A03	Mm.181824	NM_007466	Api5	Apoptosis inhibitor 5
A04	Mm.389890	NM_030693	Atf5	Activating transcription factor 5
A05	Mm.4387	NM_007522	Bad	Bcl-associated death promoter
A06	Mm.688	NM_009736	Bag1	Bcl2-associated athanogene 1
A07	Mm.84073	NM_013863	Bag3	Bcl2-associated athanogene 3
A08	Mm.2443	NM_007523	Bak1	BCL2-antagonist/killer 1
A09	Mm.19904	NM_007527	Bax	Bcl2-associated X protein
A10	Mm.239141	NM_009740	Bcl10	B-cell leukemia/lymphoma 10
A11	Mm.257460	NM_009741	Bcl2	B-cell leukemia/lymphoma 2
A12	Mm.238213	NM_009743	Bcl2l1	Bcl2-like 1
B01	Mm.25988	NM_013479	Bcl2l10	Bcl2-like 10
B02	Mm.6967	NM_007537	Bcl2l2	Bcl2-like 2
B03	Mm.235081	NM_007544	Bid	BH3 interacting domain death agonist
B04	Mm.6898	NM_008670	Birc1a	Baculoviral IAP repeat-containing 1a
B05	Mm.89961	NM_010872	Birc1b	Baculoviral IAP repeat-containing 1b
B06	Mm.335659	NM_007465	Birc2	Baculoviral IAP repeat-containing 2
B07	Mm.2026	NM_007464	Birc3	Baculoviral IAP repeat-containing 3
B08	Mm.259879	NM_009688	Birc4	Baculoviral IAP repeat-containing 4
B09	Mm.8552	NM_009689	Birc5	Baculoviral IAP repeat-containing 5
B10	Mm.159777	NM_016787	Bnip2	BCL2/adenovirus E1B interacting protein 1, NIP2
B11	Mm.378890	NM_009760	Bnip3	BCL2/adenovirus E1B interacting protein 1, NIP3
B12	Mm.29820	NM_009761	Bnip3l	BCL2/adenovirus E1B interacting protein 3-like
C01	Mm.3295	NM_016778	Bok	Bcl-2-related ovarian killer protein
C02	Mm.17629	NM_130859	Card10	Caspase recruitment domain family, member 10
C03	Mm.28498	NM_172729	Nod1	Nucleotide-binding oligomerization domain containing 1
C04	Mm.31252	XM_139295	Card6	Caspase recruitment domain family, member 6
C05	Mm.1051	NM_009807	Casp1	Caspase 1
C06	Mm.42163	NM_009808	Casp12	Caspase 12
C07	Mm.20940	NM_009809	Casp14	Caspase 14
C08	Mm.3921	NM_007610	Casp2	Caspase 2
C09	Mm.34405	NM_009810	Casp3	Caspase 3
C10	Mm.1569	NM_007609	Casp4	Caspase 4, apoptosis-related cysteine peptidase
C11	Mm.281379	NM_009811	Casp6	Caspase 6
C12	Mm.35687	NM_007611	Casp7	Caspase 7
D01	Mm.336851	NM_009812	Casp8	Caspase 8
D02	Mm.88829	NM_015733	Casp9	Caspase 9
D03	Mm.11778	NM_009805	Cflar	CASP8 and FADD-like apoptosis regulator

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Position	UniGene	GenBank	Symbol	Description
D04	Mm.449	NM_007702	Cidea	Cell death-inducing DNA fragmentation factor, alpha subunit-like effector A
D05	Mm.435554	NM_009894	Cideb	Cell death-inducing DNA fragmentation factor, alpha subunit-like effector B
D06	Mm.218009	NM_009950	Cradd	CASP2 and RIPK1 domain containing adaptor with death domain
D07	Mm.319038	NM_010015	Dad1	Defender against cell death 1
D08	Mm.24103	NM_029653	Dapk1	Death associated protein kinase 1
D09	Mm.41433	NM_010044	Dffa	DNA fragmentation factor, alpha subunit
D10	Mm.388918	NM_007859	Dffb	DNA fragmentation factor, beta subunit
D11	Mm.22216	NM_010286	Tsc22d3	TSC22 domain family 3
D12	Mm.5126	NM_010175	Fadd	Fas (TNFRSF6)-associated via death domain
E01	Mm.1626	NM_007987	Fas	Fas (TNF receptor superfamily member)
E02	Mm.3355	NM_010177	Fasl	Fas ligand (TNF superfamily, member 6)
E03	Mm.57223	NM_008234	Hells	Helicase, lymphoid specific
E04	Mm.874	NM_010548	Il10	Interleukin 10
E05	Mm.103624	NM_010712	Lhx4	LIM homeobox protein 4
E06	Mm.3122	NM_010736	Ltbr	Lymphotoxin B receptor
E07	Mm.1639	NM_008562	Mcl1	Myeloid cell leukemia sequence 1
E08	Mm.256765	NM_008689	Nfkb1	Nuclear factor of kappa light chain gene enhancer in B-cells 1, p105
E09	Mm.275430	NM_080637	Nme5	Expressed in non-metastatic cells 5
E10	Mm.204876	NM_030152	Nol3	Nucleolar protein 3 (apoptosis repressor with CARD domain)
E11	Mm.131572	NM_172858	Pak7	P21 (CDKN1A)-activated kinase 7
E12	Mm.347478	NM_145737	Pim2	Proviral integration site 2
F01	Mm.123211	NM_011130	Polb	Polymerase (DNA directed), beta
F02	Mm.347009	NM_011563	Prdx2	Peroxiredoxin 2
F03	Mm.24163	NM_023258	Pycard	PYD and CARD domain containing
F04	Mm.374799	NM_009068	Ripk1	Receptor (TNFRSF)-interacting serine-threonine kinase 1
F05	Mm.28235	XM_905787	Rnf7	Ring finger protein 7
F06	Mm.24222	NM_020011	Sphk2	Sphingosine kinase 2
F07	Mm.1293	NM_013693	Tnf	Tumor necrosis factor
F08	Mm.193430	NM_020275	Tnfrsf10b	Tumor necrosis factor receptor superfamily, member 10b
F09	Mm.15383	NM_008764	Tnfrsf11b	Tumor necrosis factor receptor superfamily, member 11b (osteoprotegerin)
F10	Mm.1258	NM_011609	Tnfrsf1a	Tumor necrosis factor receptor superfamily, member 1a
F11	Mm.271833	NM_011611	Cd40	CD40 antigen
F12	Mm.1062	NM_009425	Tnfsf10	Tumor necrosis factor (ligand) superfamily, member 10
G01	Mm.344820	NM_011614	Tnfsf12	Tumor necrosis factor (ligand) superfamily, member 12
G02	Mm.4861	NM_011616	Cd40lg	CD40 ligand
G03	Mm.42228	NM_011617	Cd70	CD70 antigen
G04	Mm.239514	NM_009421	Traf1	Tnf receptor-associated factor 1
G05	Mm.3399	NM_009422	Traf2	Tnf receptor-associated factor 2
G06	Mm.27431	NM_011632	Traf3	Tnf receptor-associated factor 3
G07	Mm.222	NM_011640	Trp53	Transformation related protein 53
G08	Mm.287450	NM_173378	Trp53bp2	Transformation related protein 53 binding protein 2
G09	Mm.393018	NM_021897	Trp53inp1	Transformation related protein 53 inducible nuclear protein 1
G10	Mm.20894	NM_011641	Trp63	Transformation related protein 63
G11	Mm.78015	NM_011642	Trp73	Transformation related protein 73
G12	Mm.29780	NM_172735	Zc3hc1	Zinc finger, C3HC type 1
H01	Mm.3317	NM_010368	Gusb	Glucuronidase, beta
H02	Mm.299381	NM_013556	Hprt1	Hypoxanthine guanine phosphoribosyl transferase 1
H03	Mm.2180	NM_008302	Hsp90ab1	Heat shock protein 90kDa alpha (cytosolic), class B member 1
H04	Mm.343110	NM_008084	Gapdh	Glyceraldehyde-3-phosphate dehydrogenase
H05	Mm.328431	NM_007393	Actb	Actin, beta, cytoplasmic
H06	N/A	N/A	MGDC	Mouse Genomic DNA Contamination
H07	N/A	N/A	RTC	Reverse Transcription Control
H08	N/A	N/A	RTC	Reverse Transcription Control
H09	N/A	N/A	RTC	Reverse Transcription Control
H10	N/A	N/A	PPC	Positive PCR Control
H11	N/A	N/A	PPC	Positive PCR Control
H12	N/A	N/A	PPC	Positive PCR Control