

# RT<sup>2</sup> Profiler PCR Array (96-Well Format and 384-Well [4 x 96] Format)

## Rhesus Macaque Ubiquitination (Ubiquitylation) Pathway

Cat. no. 330231 PAQQ-079ZA

For pathway expression analysis

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



## Description

The Rhesus Macaque Ubiquitination or Ubiquitylation Pathway RT<sup>2</sup> Profiler PCR Array profiles the expression of 84 key genes involved in the regulated degradation of cellular proteins by the ubiquitin-proteasome system. Disruption of the proteasomal degradation pathway has been implicated in a wide range of human diseases, such as cancer, diabetes and cardiovascular and neurodegenerative diseases. The array includes ubiquitin-activating enzymes (E1), ubiquitin-conjugating enzymes (E2), and ubiquitin ligases (E3). These enzymes have also been sub-categorized as regulators of key cellular processes, such as apoptosis, the cell cycle and transcription. A set of controls present on each array enables data analysis using the  $\Delta\Delta\text{CT}$  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 expression of a focused panel of genes involved in ubiquitin degradation pathway with this array.

For further details, consult the *RT<sup>2</sup> Profiler PCR Array Handbook*.

## Shipping and storage

RT<sup>2</sup> 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. RT<sup>2</sup> Profiler PCR Arrays in format H are shipped on dry ice or blue ice packs.

For long term storage, keep plates at  $-20^{\circ}\text{C}$ .

**Note:** Ensure that you have the correct RT<sup>2</sup> Profiler PCR Array format for your real-time cycler (see table above).

**Note:** Open the package and store the products appropriately immediately on receipt.

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## Array layout (96-well)

For 384-well 4 x 96 PCR arrays, genes are present in a staggered format. Refer to the *RT<sup>2</sup> Profiler PCR Array Handbook* for layout.

	1	2	3	4	5	6	7	8	9	10	11	12
<b>A</b>	ANAPC11	ANAPC2	ATG7	BARD1	BRCA1	BRCC3	BTRC	CBL	CUL1	CUL2	CUL3	CUL4B
<b>B</b>	CUL5	CUL7	DDB1	DZIP3	FBXO3	FBXO31	FBXO4	FBXW10	FBXW9	HECW1	HUWE1	LOC1004250 16
<b>C</b>	LOC694667	LOC697155	LOC698984	LOC701036	LOC701507	LOC701870	LOC702912	LOC703550	LOC710899	LOC714302	LOC721528	MARCH5
<b>D</b>	MDM2	MIB1	MOC53	MUL1	NAE1	NEDD8	RFWD2	RNF123	RNF148	SAE1	SKP2	SMURF1
<b>E</b>	SMURF2	STUB1	SYVN1	TMEM189	TP53	UBA1	UBA2	UBA3	UBA6	UBA7	UBE2A	UBE2B
<b>F</b>	UBE2C	UBE2D1	UBE2D3	UBE2E2	UBE2E3	UBE2F	UBE2G2	UBE2H	UBE2I	UBE2J1	UBE2J2	UBE2K
<b>G</b>	UBE2L3	UBE2M	UBE2Q1	UBE2S	UBE2T	UBE2W	UBE2Z	UBE3A	UBE4B	UBR1	UBR2	WWP1
<b>H</b>	ACTB	B2M	GAPDH	LOC709186	RPL13A	QGDC	RTC	RTC	RTC	PPC	PPC	PPC

## Gene table: RT<sup>2</sup> Profiler PCR Array

Position	UniGene	GenBank	Symbol	Description
A01	Mmu.1688	XM_001112301	ANAPC11	Anaphase-promoting complex subunit 11-like
A02	Mmu.19914	XM_001090195	ANAPC2	Anaphase promoting complex subunit 2
A03	Mmu.21936	XM_001087688	ATG7	ATG7 autophagy related 7 homolog (S. cerevisiae)
A04	Mmu.26908	XM_001084740	BARD1	BRCA1 associated RING domain 1
A05	Mmu.17471	NM_001114949	BRCA1	Breast cancer 1, early onset
A06	Mmu.21786	XM_001097957	BRCC3	BRCA1/BRCA2-containing complex, subunit 3
A07	Mmu.28657	XM_002805789	BTRC	Beta-transducin repeat containing E3 ubiquitin protein ligase
A08	Mmu.30036	XM_001104812	CBL	Cas-Br-M (murine) ecotropic retroviral transforming sequence
A09	Mmu.9717	XM_002803512	CUL1	Cullin 1
A10	Mmu.22177	XM_001087735	CUL2	Cullin 2
A11	Mmu.22552	XM_001109745	CUL3	Cullin 3
A12	Mmu.3258	XM_001086195	CUL4B	Cullin 4B
B01	Mmu.26452	XM_001103587	CUL5	Cullin 5
B02	Mmu.23329	XM_001088003	CUL7	Cullin 7
B03	Mmu.21140	XM_001082958	DDB1	Damage-specific DNA binding protein 1, 127kDa
B04	Mmu.23533	XM_002808316	DZIP3	E3 ubiquitin-protein ligase DZIP3-like
B05	Mmu.28476	XM_001082360	FBXO3	F-box protein 3
B06	Mmu.20609	XM_001086503	FBXO31	F-box protein 31
B07	Mmu.2644	XM_001088308	FBXO4	F-box protein 4
B08	Mmu.26121	XM_001084872	FBXW10	F-box and WD repeat domain containing 10
B09	Mmu.25629	XM_001108547	FBXW9	F-box and WD repeat domain containing 9
B10	Mmu.32347	XM_001096775	HECW1	HECT, C2 and WW domain containing E3 ubiquitin protein ligase 1
B11	Mmu.11124	XM_001088987	HUWE1	HECT, UBA and WWE domain containing 1
B12	Mmu.28561	XM_002800991	LOC100425016	Ubiquitin-conjugating enzyme E2 R1-like
C01	Mmu.9813	XM_002804538	LOC694667	Ubiquitin-conjugating enzyme E2 D2-like
C02	Mmu.29784	XM_002808017	LOC697155	E3 ubiquitin-protein ligase HECW2-like
C03	Mmu.28952	XM_002808385	LOC698984	Cullin-9-like
C04	Mmu.922	XM_001089338	LOC701036	Ubiquitin-conjugating enzyme E2 E1-like
C05	N/A	XM_001089803	LOC701507	Ubiquitin-conjugating enzyme E2 R2-like
C06	Mmu.24263	XM_001090152	LOC701870	Von Hippel-Lindau disease tumor suppressor-like
C07	Mmu.19744	XM_001091222	LOC702912	Protein ariadne-1 homolog
C08	N/A	XM_001094634	LOC703550	S-phase kinase-associated protein 1-like
C09	Mmu.23669	XM_001099588	LOC710899	E3 ubiquitin-protein ligase parkin-like
C10	Mmu.446	XM_002808152	LOC714302	Cullin-4A-like
C11	Mmu.26182	XM_001117702	LOC721528	Ubiquitin-conjugating enzyme E2 G1-like
C12	Mmu.11534	XM_001089783	MARCH5	Membrane-associated ring finger (C3HC4) 5
D01	Mmu.31140	NM_001266402	MDM2	Mdm2 p53 binding protein homolog (mouse)
D02	Mmu.4788	XM_001092086	MIB1	Mindbomb homolog 1 (Drosophila)
D03	Mmu.27453	XM_001093903	MOC53	Molybdenum cofactor synthesis 3
D04	Mmu.22231	XM_001096167	MUL1	Mitochondrial E3 ubiquitin protein ligase 1
D05	Mmu.23495	XM_001085059	NAE1	NEDD8 activating enzyme E1 subunit 1
D06	N/A	XM_001098135	NEDD8	Neural precursor cell expressed, developmentally down-regulated 8

Position	UniGene	GenBank	Symbol	Description
D07	Mmu.22117	XM_001104796	RFWD2	E3 ubiquitin-protein ligase RFWD2-like
D08	Mmu.24222	XM_001106313	RNF123	Ring finger protein 123
D09	Mmu.19873	XM_001084777	RNF148	Ring finger protein 148
D10	Mmu.672	XM_001109956	SAE1	SUMO1 activating enzyme subunit 1
D11	Mmu.22434	XM_001093834	SKP2	S-phase kinase-associated protein 2 (p45)
D12	Mmu.32101	NM_001257631	SMURF1	SMAD specific E3 ubiquitin protein ligase 1
E01	Mmu.25983	XM_001109913	SMURF2	SMAD specific E3 ubiquitin protein ligase 2
E02	Mmu.10137	XM_001086501	STUB1	STIP1 homology and U-box containing protein 1, E3 ubiquitin protein ligase
E03	Mmu.19284	XM_001114254	SYVN1	Synovial apoptosis inhibitor 1, synoviolin
E04	Mmu.18639	NM_001194059	TMEM189	Transmembrane protein 189
E05	Mmu.3286	NM_001047151	TP53	Tumor protein p53
E06	Mmu.2813	XM_001092372	UBA1	Ubiquitin-like modifier activating enzyme 1
E07	Mmu.13107	XM_001091974	UBA2	Ubiquitin-like modifier activating enzyme 2
E08	Mmu.32389	XM_001088171	UBA3	Ubiquitin-like modifier activating enzyme 3
E09	Mmu.28903	XM_002804103	UBA6	Ubiquitin-like modifier activating enzyme 6
E10	Mmu.20021	XM_001105981	UBA7	Ubiquitin-like modifier activating enzyme 7
E11	Mmu.839	XM_001082047	UBE2A	Ubiquitin-conjugating enzyme E2A
E12	Mmu.2430	NM_001194433	UBE2B	Ubiquitin-conjugating enzyme E2B
F01	N/A	XM_001083155	UBE2C	Ubiquitin-conjugating enzyme E2C
F02	Mmu.890	XM_001097762	UBE2D1	Ubiquitin-conjugating enzyme E2D 1
F03	Mmu.4221	XM_001109666	UBE2D3	Ubiquitin-conjugating enzyme E2 D3-like
F04	Mmu.18684	XM_001089978	UBE2E2	Ubiquitin-conjugating enzyme E2E 2
F05	Mmu.1876	XM_001100742	UBE2E3	Ubiquitin-conjugating enzyme E2 E3-like
F06	Mmu.13402	XM_001085096	UBE2F	Ubiquitin-conjugating enzyme E2F (putative)
F07	Mmu.19159	XM_001101137	UBE2G2	Ubiquitin-conjugating enzyme E2G 2
F08	Mmu.995	XM_001093712	UBE2H	Ubiquitin-conjugating enzyme E2H
F09	Mmu.10576	XM_001118584	UBE2I	Ubiquitin-conjugating enzyme E2I
F10	Mmu.1281	XM_001096217	UBE2J1	Ubiquitin-conjugating enzyme E2, J1, U
F11	Mmu.24789	XM_001092754	UBE2J2	Ubiquitin-conjugating enzyme E2 J2-like
F12	Mmu.4081	XM_001092929	UBE2K	Ubiquitin-conjugating enzyme E2K
G01	Mmu.1675	XM_001087183	UBE2L3	Ubiquitin-conjugating enzyme E2L 3
G02	Mmu.19225	XM_001099932	UBE2M	Ubiquitin-conjugating enzyme E2M
G03	Mmu.2752	XM_001111833	UBE2Q1	Ubiquitin-conjugating enzyme E2Q family member 1
G04	Mmu.20815	XM_001087564	UBE2S	Ubiquitin-conjugating enzyme E2S
G05	Mmu.21550	XM_002808256	UBE2T	Ubiquitin-conjugating enzyme E2 T-like
G06	Mmu.20584	XM_001085749	UBE2W	Ubiquitin-conjugating enzyme E2W (putative)
G07	Mmu.26065	XM_001088335	UBE2Z	Ubiquitin-conjugating enzyme E2 Z-like
G08	Mmu.12182	XM_001108510	UBE3A	Ubiquitin protein ligase E3A
G09	Mmu.24744	XM_001101836	UBE4B	Ubiquitination factor E4B
G10	Mmu.2057	XM_001105721	UBR1	Ubiquitin protein ligase E3 component n-recognin 1
G11	Mmu.20747	XM_001088074	UBR2	Ubiquitin protein ligase E3 component n-recognin 2
G12	Mmu.1001	XM_001083173	WWP1	WW domain containing E3 ubiquitin protein ligase 1
H01	Mmu.11089	NM_001033084	ACTB	Actin, beta
H02	Mmu.5037	NM_001047137	B2M	Beta-2-microglobulin
H03	Mmu.3145	XM_001105471	GAPDH	Glyceraldehyde-3-phosphate dehydrogenase
H04	Mmu.12316	XM_001097691	LOC709186	Hypoxanthine-guanine phosphoribosyltransferase-like
H05	Mmu.2512	XM_001115079	RPL13A	Ribosomal protein L13A
H06	N/A	SA_00125	QGDC	Rhesus Macaque 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, RT<sup>2</sup> Profiler PCR Arrays should be used together with the RT<sup>2</sup> First Strand Kit for cDNA synthesis and RT<sup>2</sup> SYBR<sup>®</sup> Green qPCR Mastermixes for PCR.

Product	Contents	Cat. no.
RT <sup>2</sup> First Strand Kit (12)	Enzymes and reagents for cDNA synthesis	330401
RT <sup>2</sup> 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 <sup>2</sup> 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 <sup>2</sup> 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.

RT<sup>2</sup> 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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