# RT² Profiler PCR Array (Rotor-Gene® Format)

# Zebrafish Apoptosis

### Cat. no. 330231 PAZF-012ZR

### For pathway expression analysis

| Format | For use with the following real-time cyclers |
|---|---|
| RT² Profiler PCR Array, Format R | Rotor-Gene Q, other Rotor-Gene cyclers |

## Description

The Zebrafish Apoptosis RT² Profiler PCR Array profiles the expression of 84 key genes involved in programmed cell death. Apoptosis plays a critical role in normal biological processes requiring cell removal including differentiation, development, and homeostasis. Stress responses (such as heat shock, ischemia, unfolded proteins, and viral infection) cause badly damaged cells to undergo apoptosis. In cell culture, growth factor withdrawal and many known experimental compounds have a similar effect. An acquired defect in apoptosis activation often leads to uncontrolled cell growth, oncogenesis, and cancer. Ligand-bound tumor necrosis factor (TNF) receptors initiate apoptosis by recruiting FADD and other death domain adaptor proteins that then recruit and activate caspases. Environmental stresses trigger BCL2 protein oligomerization and insertion into the mitochondrial membrane, releasing APAF1 and other CARD family members that also oligomerize to recruit and activate caspases. Caspases promote a proteolysis cascade that degrades cellular protein targets, while the IAP protein family directly inhibits caspases. This array includes 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 DNA damage pathways. Monitoring the expression of these genes helps determine the mechanisms behind programmed cell death in your model system and the propensity of a cell type to undergo apoptosis normally. Using real-time PCR, you can easily and reliably analyze expression of a focused panel of genes related to apoptosis 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 cycler (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 | Dr.115152 | XM_005172047 | abl1 | C-abl oncogene 1, non-receptor tyrosine kinase |
| 2 | Dr.7667 | NM_200102 | aifm1 | Programmed cell death 8 (apoptosis-inducing factor) |
| 3 | N/A | NM_001281801 | akt1 | V-akt murine thymoma viral oncogene homolog 1 |
| 4 | Dr.78833 | NM_131608 | apaf1 | Apoptotic protease activating factor 1 |
| 5 | Dr.122501 | NM_199540 | api5 | Apoptosis inhibitor 5 |
| 6 | Dr.75370 | NM_001270595 | badb | BCL2-antagonist of cell death |
| 7 | Dr.108594 | NM_001098736 | bag1 | Si:dkey-216e9.4 |
| 8 | Dr.79182 | NM_001003533 | bag3 | BCL2-associated athanogene 3 |
| 9 | Dr.14459 | NM_001013296 | baxb | Bcl2-associated X protein, b |
| 10 | N/A | XM_002660692 | bcl10 | B-cell lymphoma/leukemia 10-like |
| 11 | Dr.45607 | NM_001030253 | bcl2a | B-cell leukemia/lymphoma 2 |
| 12 | Dr.79623 | NM_131807 | bcl2l1 | Bcl2-like 1 |
| 13 | Dr.126796 | NM_001135791 | bcl2l11 | BCL2-like 11 |
| 14 | Dr.151151 | NM_001079826 | bida | BH3 interacting domain death agonist |
| 15 | Dr.82304 | NM_001045038 | bik | BCL2-interacting killer (apoptosis-inducing) |
| 16 | Dr.77093 | NM_194395 | birc2 | Baculoviral IAP repeat-containing 2 |
| 17 | Dr.14671 | NM_194397 | birc5a | Baculoviral IAP repeat-containing 5a |
| 18 | Dr.118830 | XM_009293036 | birc6 | Baculoviral IAP repeat-containing 6 |
| 19 | Dr.85468 | XM_684156 | bnip1a | Si:ch73-269a20.1 |
| 20 | Dr.83417 | NM_201218 | bnip2 | BCL2/adenovirus E1B interacting protein 2 |
| 21 | Dr.76105 | NM_001012245 | bnip3 | BCL2/adenovirus E1B interacting protein 3 |
| 22 | Dr.78270 | NM_205571 | bnip3lb | BCL2/adenovirus E1B interacting protein 3-like b |
| 23 | Dr.34035 | NM_001003612 | boka | BCL2-related ovarian killer a |
| 24 | Dr.108603 | NM_205744 | braf | V-raf murine sarcoma viral oncogene homolog B1 |
| 25 | Dr.162020 | NM_001042695 | casp2 | Caspase 2, apoptosis-related cysteine protease |
| 26 | Dr.11726 | NM_131877 | casp3a | Caspase 3, apoptosis-related cysteine protease a |
| 27 | Dr.79640 | NM_001020497 | casp6 | Caspase 6, apoptosis-related cysteine peptidase |
| 28 | Dr.88746 | NM_001020607 | casp7 | Caspase 7, apoptosis-related cysteine peptidase |
| 29 | Dr.10334 | NM_131510 | casp8 | Caspase 8, apoptosis-related cysteine peptidase |
| 30 | Dr.78866 | NM_001007404 | casp9 | Caspase 9, apoptosis-related cysteine protease |
| 31 | Dr.76374 | NM_131505 | caspa | Caspase a |
| 32 | Dr.81726 | NM_152884 | caspb | Caspase b |
| 33 | Dr.40733 | NM_001145592 | caspbl | Caspase b, like |
| 34 | Dr.86735 | NM_001083862 | caspxa | Caspase Xa |
| 35 | N/A | XM_005157937 | cd27 | CD27 molecule |
| 36 | Dr.92473 | NM_001145246 | cd40 | CD40 antigen |
| 37 | Dr.117952 | NM_001144809 | cd40lg | CD40 ligand |
| 38 | Dr.159804 | NM_194399 | cflara | CASP8 and FADD-like apoptosis regulator |

| Position | UniGene | GenBank | Symbol | Description |
|---|---|---|---|---|
| 39 | Dr.39823 | NM_001256257 | cideb | Cell death-inducing DFFA-like effector b |
| 40 | Dr.85491 | NM_001006066 | cradd | CASP2 and RIPK1 domain containing adaptor with death domain |
| 41 | N/A | XR_117910 | cycsa | Cytochrome c, somatic a |
| 42 | Dr.114083 | NM_001100439 | dad1 | Defender against cell death 1 |
| 43 | Dr.80768 | NM_001099990 | dapk1 | Si:ch211-66i11.1 |
| 44 | Dr.82562 | NM_001002631 | dffa | DNA fragmentation factor, alpha polypeptide |
| 45 | Dr.82509 | NM_194404 | dffb | DNA fragmentation factor, beta polypeptide (caspase-activated DNase) |
| 46 | Dr.18420 | NM_200346 | diabloa | Zgc:63938 |
| 47 | Dr.94478 | XM_001923858 | fadd | Fas (tnfrsf6)-associated via death domain |
| 48 | Dr.85425 | NM_001002583 | faima | Zgc:92723 |
| 49 | Dr.150815 | XM_685355 | fas | Fas (TNF receptor superfamily, member 6) |
| 50 | Dr.72304 | NM_001042701 | faslg | Fas ligand (TNF superfamily, member 6) |
| 51 | Dr.27107 | NM_200576 | gadd45aa | Growth arrest and DNA-damage-inducible, alpha, a |
| 52 | Dr.83410 | NM_001002216 | gadd45ab | Growth arrest and DNA-damage-inducible, alpha, b |
| 53 | Dr.76293 | NM_152969 | igf1rb | Insulin-like growth factor 1b receptor |
| 54 | Dr.135567 | NM_001020785 | il10 | Interleukin 10 |
| 55 | Dr.94014 | NM_001024821 | lta | Lymphotoxin alpha (TNF superfamily, member 1) |
| 56 | Dr.33208 | NM_131599 | mcl1a | Myeloid cell leukemia sequence 1a |
| 57 | Dr.47468 | XM_003199975 | nfkb1 | NF-kB1 precursor protein |
| 58 | N/A | XM_002665060 | nod1 | Nucleotide-binding oligomerization domain containing 1 |
| 59 | Dr.8329 | NM_131495 | pycard | PYD and CARD domain containing |
| 60 | Dr.103967 | NM_001043350 | ripk1l | Receptor (TNFRSF)-interacting serine-threonine kinase 1, like |
| 61 | Dr.150902 | NM_194411 | ripk2 | Receptor-interacting serine-threonine kinase 2 |
| 62 | Dr.94015 | NM_001024447 | tnfb | Tumor necrosis factor b (TNF superfamily, member 2) |
| 63 | Dr.155306 | XM_005162629 | tnfrsf11a | Tumor necrosis factor receptor superfamily member 11A-like |
| 64 | Dr.83114 | XM_002665433 | tnfrsf11b | Si:ch1073-210b3.1 |
| 65 | N/A | XM_009306381 | tnfrsf13b | Tumor necrosis factor receptor superfamily, member 13B |
| 66 | N/A | XM_009306702 | tnfrsf17 | Tumor necrosis factor receptor superfamily, member 17 |
| 67 | Dr.90157 | NM_001113524 | tnfrsf18 | Tumor necrosis factor receptor superfamily, member 18 |
| 68 | Dr.67639 | NM_001044904 | tnfrsf19 | Tumor necrosis factor receptor superfamily, member 19 |
| 69 | Dr.27758 | NM_213190 | tnfrsf1a | Tumor necrosis factor receptor superfamily, member 1a |
| 70 | Dr.90354 | NM_001089510 | tnfrsf1b | Zgc:163064 |
| 71 | Dr.108925 | NM_001042688 | tnfrsf21 | Tumor necrosis factor receptor superfamily, member 21 |
| 72 | Dr.94249 | XM_001923079 | tnfrsf9b | Tumor necrosis factor receptor superfamily, member 9b |
| 73 | Dr.10712 | NM_131840 | tnfrsfa | Tumor necrosis factor receptor superfamily, member a |
| 74 | Dr.86839 | NM_001002593 | tnfsf10 | Tumor necrosis factor (ligand) superfamily, member 10 like 2 |
| 75 | Dr.88400 | NM_001076607 | tnfsf12 | Zgc:153941 |
| 76 | Dr.75100 | NM_131327 | tp53 | Tumor protein p53 |
| 77 | Dr.32621 | NM_214814 | tp53bp2a | Tumor protein p53 binding protein, 2 |
| 78 | Dr.32588 | NM_152248 | tp63 | Tumor protein p63 |

| Position | UniGene | GenBank | Symbol | Description |
|---|---|---|---|---|
| 79 | Dr.24319 | NM_183340 | tp73 | Tumor protein p73 |
| 80 | Dr.105498 | NM_131607 | tradd | Tnfrsf1a-associated via death domain |
| 81 | Dr.134981 | NM_001128381 | traf1 | TNF receptor-associated factor 1 |
| 82 | Dr.92260 | XM_005171946 | traf2a | Tnf receptor-associated factor 2a |
| 83 | Dr.81587 | NM_001003513 | traf3 | TNF receptor-associated factor 3 |
| 84 | Dr.77503 | NM_194396 | xiap | X-linked inhibitor of apoptosis |
| 85 | Dr.47173 | NM_214784 | acta1b | Actin, alpha 1b, skeletal muscle |
| 86 | Dr.51646 | NM_001159768 | b2m | Beta-2-microglobulin |
| 87 | Dr.77915 | NM_212986 | hprt1 | Hypoxanthine phosphoribosyltransferase 1 |
| 88 | Dr.150274 | NM_201579 | nono | Non-POU domain containing, octamer-binding |
| 89 | Dr.32450 | NM_212784 | rpl13a | Ribosomal protein L13a |
| 90 | N/A zebrafish | SA_00143 | ZGDC | Zebrafish 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. |
|---|---|---|
| RT² First Strand Kit (12) | Enzymes and reagents for cDNA synthesis | 330401 |
| RT² 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.

For up-to-date licensing information and product-specific disclaimers, see the respective QIAGEN kit handbook or user manual. QIAGEN kit handbooks and user manuals are available at www.qiagen. com or can be requested from QIAGEN Technical Services or your local distributor.

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