# RT² Profiler PCR Array (96-Well Format and 384-Well [4 x 96] Format)

# Human Stress & Toxicity PathwayFinder

### Cat. no. 330231 PAHS-003ZA

### For pathway expression analysis

| Format | For use with the following real-time cyclers |
|---|---|
| RT² 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 |
| RT² Profiler PCR Array, Format C | Applied Biosystems models 7500 (Fast block), 7900HT (Fast block), StepOnePlus™, ViiA 7 (Fast block) |
| RT² Profiler PCR Array, Format D | Bio-Rad CFX96™; Bio-Rad/MJ Research models DNA Engine Opticon®, DNA Engine Opticon 2; Stratagene Mx4000® |
| RT² Profiler PCR Array, Format E | Applied Biosystems models 7900HT (384-well block), ViiA 7 (384-well block); Bio-Rad CFX384™ |
| RT² Profiler PCR Array, Format F | Roche® LightCycler® 480 (96-well block) |
| RT² Profiler PCR Array, Format G | Roche LightCycler 480 (384-well block) |
| RT² Profiler PCR Array, Format H | Fluidigm® BioMark™ |

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Sample & Assay Technologies

## Description

The Human Stress & Toxicity RT² Profiler PCR Array profiles the expression of 84 key genes regulated during cellular responses to stress and toxic compounds. Cells exposed to stress or toxins, either in vitro or in vivo, respond in a variety of ways depending on the stress and the cell type. Key front-line target organs such as heart, kidney, liver, and skin must be equipped to respond to stress-inducing or toxic environmental insults in an appropriate way. Toxicologists use cultured cells from these organs as model systems to ascertain the effects of test compounds. Reactive oxygen species induce oxidative stress, and elevated temperatures induce heat shock. Imbalances in osmolarity and inhibitors of ion channels cause osmotic stress, while protein synthesis inhibitors activate the unfolded protein response. Stress response pathways often cross-talk, particularly under prolonged exposure conditions or exposure to multiple stresses. For example, inflammation induces stress responses, but specific chronic sources of stress, such as oxidative stress and heat shock, also induce inflammation. These stresses can ultimately cause DNA damage or other types of cellular damage, which can lead to cell death if not repaired. Studying the potential activation of these pathways simultaneously can identify compounds or experimental conditions toxic to cells, evaluate the cell's ability to respond to cellular damage, and identify potential interactions between the stress responses. Using real-time PCR, research studies can easily and reliably analyze the expression of a focused panel of genes involved in cellular stress and toxic insults with this array.

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

## Shipping and storage

RT² 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. RT² Profiler PCR Arrays in format H are shipped on dry ice or blue ice packs.

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 (96-well)

For 384-well 4 x 96 PCR arrays, genes are present in a staggered format. Refer to the *RT² Profiler PCR Array Handbook* for layout.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| A | ADM | AKR1B1 | AQP1 | AQP2 | AQP4 | ARNT | ATF4 | ATF6 | ATF6B | ATG12 | ATG5 | ATG7 |
| B | ATM | ATR | BBC3 | BECN1 | BID | BNIP3L | CA9 | CALR | CASP1 | CCL2 | CD40LG | CDKN1A |
| C | CFTR | CHEK1 | CHEK2 | CRP | DDB2 | DDIT3 | DNAJC3 | EDN1 | EPO | FAS | FTH1 | GADD45A |
| D | GADD45G | GCLC | GCLM | GRB2 | GSR | GSTP1 | HMOX1 | HSP90AA1 | HSP90B1 | HSPA4 | HSPA4L | HSPA5 |
| E | HUS1 | IFNG | IL1A | IL1B | IL6 | IL8 | LDHA | MCL1 | MMP9 | MRE11A | NBN | NFAT5 |
| F | NQO1 | PARP1 | PRDX1 | PVR | RAD17 | RAD51 | RAD9A | RIPK1 | SERPINE1 | SLC2A1 | SLC5A3 | SQSTM1 |
| G | TLR4 | TNF | TNFRSF10A | TNFRSF10B | TNFRSF1A | TP53 | TXN | TXNL4B | TXNRD1 | ULK1 | VEGFA | XPC |
| H | ACTB | B2M | GAPDH | HPRT1 | RPLP0 | HGDC | RTC | RTC | RTC | PPC | PPC | PPC |

## Gene table: RT² Profiler PCR Array

| Position | UniGene | GenBank | Symbol | Description |
|---|---|---|---|---|
| A01 | Hs.441047 | NM_001124 | ADM | Adrenomedullin |
| A02 | Hs.521212 | NM_001628 | AKR1B1 | Aldo-keto reductase family 1, member B1 (aldose reductase) |
| A03 | Hs.76152 | NM_198098 | AQP1 | Aquaporin 1 (Colton blood group) |
| A04 | Hs.130730 | NM_000486 | AQP2 | Aquaporin 2 (collecting duct) |
| A05 | Hs.315369 | NM_001650 | AQP4 | Aquaporin 4 |
| A06 | Hs.632446 | NM_001668 | ARNT | Aryl hydrocarbon receptor nuclear translocator |
| A07 | Hs.496487 | NM_001675 | ATF4 | Activating transcription factor 4 (tax-responsive enhancer element B67) |
| A08 | Hs.492740 | NM_007348 | ATF6 | Activating transcription factor 6 |
| A09 | Hs.42853 | NM_004381 | ATF6B | Activating transcription factor 6 beta |
| A10 | Hs.264482 | NM_004707 | ATG12 | ATG12 autophagy related 12 homolog (S. cerevisiae) |
| A11 | Hs.486063 | NM_004849 | ATG5 | ATG5 autophagy related 5 homolog (S. cerevisiae) |
| A12 | Hs.716466 | NM_006395 | ATG7 | ATG7 autophagy related 7 homolog (S. cerevisiae) |
| B01 | Hs.367437 | NM_000051 | ATM | Ataxia telangiectasia mutated |
| B02 | Hs.271791 | NM_001184 | ATR | Ataxia telangiectasia and Rad3 related |
| B03 | Hs.467020 | NM_014417 | BBC3 | BCL2 binding component 3 |
| B04 | Hs.12272 | NM_003766 | BECN1 | Beclin 1, autophagy related |
| B05 | Hs.591054 | NM_001196 | BID | BH3 interacting domain death agonist |
| B06 | Hs.131226 | NM_004331 | BNIP3L | BCL2/adenovirus E1B 19kDa interacting protein 3-like |
| B07 | Hs.63287 | NM_001216 | CA9 | Carbonic anhydrase IX |
| B08 | Hs.515162 | NM_004343 | CALR | Calreticulin |
| B09 | Hs.2490 | NM_033292 | CASP1 | Caspase 1, apoptosis-related cysteine peptidase (interleukin 1, beta, convertase) |
| B10 | Hs.303649 | NM_002982 | CCL2 | Chemokine (C-C motif) ligand 2 |
| B11 | Hs.592244 | NM_000074 | CD40LG | CD40 ligand |
| B12 | Hs.370771 | NM_000389 | CDKN1A | Cyclin-dependent kinase inhibitor 1A (p21, Cip1) |
| C01 | Hs.489786 | NM_000492 | CFTR | Cystic fibrosis transmembrane conductance regulator (ATP-binding cassette sub-family C, member 7) |
| C02 | Hs.24529 | NM_001274 | CHEK1 | CHK1 checkpoint homolog (S. pombe) |
| C03 | Hs.291363 | NM_007194 | CHEK2 | CHK2 checkpoint homolog (S. pombe) |
| C04 | Hs.709456 | NM_000567 | CRP | C-reactive protein, pentraxin-related |
| C05 | Hs.700338 | NM_000107 | DDB2 | Damage-specific DNA binding protein 2, 48kDa |
| C06 | Hs.728989 | NM_004083 | DDIT3 | DNA-damage-inducible transcript 3 |
| C07 | Hs.59214 | NM_006260 | DNAJC3 | DnaJ (Hsp40) homolog, subfamily C, member 3 |
| C08 | Hs.511899 | NM_001955 | EDN1 | Endothelin 1 |
| C09 | Hs.2303 | NM_000799 | EPO | Erythropoietin |
| C10 | Hs.244139 | NM_000043 | FAS | Fas (TNF receptor superfamily, member 6) |
| C11 | Hs.645560 | NM_002032 | FTH1 | Ferritin, heavy polypeptide 1 |
| C12 | Hs.80409 | NM_001924 | GADD45A | Growth arrest and DNA-damage-inducible, alpha |
| D01 | Hs.9701 | NM_006705 | GADD45G | Growth arrest and DNA-damage-inducible, gamma |
| D02 | Hs.654465 | NM_001498 | GCLC | Glutamate-cysteine ligase, catalytic subunit |
| D03 | Hs.315562 | NM_002061 | GCLM | Glutamate-cysteine ligase, modifier subunit |
| D04 | Hs.444356 | NM_002086 | GRB2 | Growth factor receptor-bound protein 2 |
| D05 | Hs.271510 | NM_000637 | GSR | Glutathione reductase |
| D06 | Hs.523836 | NM_000852 | GSTP1 | Glutathione S-transferase pi 1 |
| D07 | Hs.517581 | NM_002133 | HMOX1 | Heme oxygenase (decycling) 1 |
| D08 | Hs.525600 | NM_001017963 | HSP90AA1 | Heat shock protein 90kDa alpha (cytosolic), class A member 1 |

| Position | UniGene | GenBank | Symbol | Description |
|---|---|---|---|---|
| D09 | Hs.192374 | NM_003299 | HSP90B1 | Heat shock protein 90kDa beta (Grp94), member 1 |
| D10 | Hs.90093 | NM_002154 | HSPA4 | Heat shock 70kDa protein 4 |
| D11 | Hs.135554 | NM_014278 | HSPA4L | Heat shock 70kDa protein 4-like |
| D12 | Hs.716396 | NM_005347 | HSPA5 | Heat shock 70kDa protein 5 (glucose-regulated protein, 78kDa) |
| E01 | Hs.152983 | NM_004507 | HUS1 | HUS1 checkpoint homolog (S. pombe) |
| E02 | Hs.856 | NM_000619 | IFNG | Interferon, gamma |
| E03 | Hs.1722 | NM_000575 | IL1A | Interleukin 1, alpha |
| E04 | Hs.126256 | NM_000576 | IL1B | Interleukin 1, beta |
| E05 | Hs.654458 | NM_000600 | IL6 | Interleukin 6 (interferon, beta 2) |
| E06 | Hs.624 | NM_000584 | IL8 | Interleukin 8 |
| E07 | Hs.2795 | NM_005566 | LDHA | Lactate dehydrogenase A |
| E08 | Hs.632486 | NM_021960 | MCL1 | Myeloid cell leukemia sequence 1 (BCL2-related) |
| E09 | Hs.297413 | NM_004994 | MMP9 | Matrix metallopeptidase 9 (gelatinase B, 92kDa gelatinase, 92kDa type IV collagenase) |
| E10 | Hs.192649 | NM_005590 | MRE11A | MRE11 meiotic recombination 11 homolog A (S. cerevisiae) |
| E11 | Hs.492208 | NM_002485 | NBN | Nibrin |
| E12 | Hs.371987 | NM_006599 | NFAT5 | Nuclear factor of activated T-cells 5, tonicity-responsive |
| F01 | Hs.406515 | NM_000903 | NQO1 | NAD(P)H dehydrogenase, quinone 1 |
| F02 | Hs.177766 | NM_001618 | PARP1 | Poly (ADP-ribose) polymerase 1 |
| F03 | Hs.180909 | NM_002574 | PRDX1 | Peroxiredoxin 1 |
| F04 | Hs.171844 | NM_006505 | PVR | Poliovirus receptor |
| F05 | Hs.16184 | NM_002873 | RAD17 | RAD17 homolog (S. pombe) |
| F06 | Hs.631709 | NM_002875 | RAD51 | RAD51 homolog (S. cerevisiae) |
| F07 | Hs.655354 | NM_004584 | RAD9A | RAD9 homolog A (S. pombe) |
| F08 | Hs.519842 | NM_003804 | RIPK1 | Receptor (TNFRSF)-interacting serine-threonine kinase 1 |
| F09 | Hs.414795 | NM_000602 | SERPINE1 | Serpin peptidase inhibitor, clade E (nexin, plasminogen activator inhibitor type 1), member 1 |
| F10 | Hs.473721 | NM_006516 | SLC2A1 | Solute carrier family 2 (facilitated glucose transporter), member 1 |
| F11 | Hs.302742 | NM_006933 | SLC5A3 | Solute carrier family 5 (sodium/myo-inositol cotransporter), member 3 |
| F12 | Hs.437277 | NM_003900 | SQSTM1 | Sequestosome 1 |
| G01 | Hs.174312 | NM_138554 | TLR4 | Toll-like receptor 4 |
| G02 | Hs.241570 | NM_000594 | TNF | Tumor necrosis factor |
| G03 | Hs.591834 | NM_003844 | TNFRSF10A | Tumor necrosis factor receptor superfamily, member 10a |
| G04 | Hs.521456 | NM_003842 | TNFRSF10B | Tumor necrosis factor receptor superfamily, member 10b |
| G05 | Hs.279594 | NM_001065 | TNFRSF1A | Tumor necrosis factor receptor superfamily, member 1A |
| G06 | Hs.654481 | NM_000546 | TP53 | Tumor protein p53 |
| G07 | Hs.435136 | NM_003329 | TXN | Thioredoxin |
| G08 | Hs.134406 | NM_017853 | TXNL4B | Thioredoxin-like 4B |
| G09 | Hs.728817 | NM_003330 | TXNRD1 | Thioredoxin reductase 1 |
| G10 | Hs.47061 | NM_003565 | ULK1 | Unc-51-like kinase 1 (C. elegans) |
| G11 | Hs.73793 | NM_003376 | VEGFA | Vascular endothelial growth factor A |
| G12 | Hs.475538 | NM_004628 | XPC | Xeroderma pigmentosum, complementation group C |
| H01 | Hs.520640 | NM_001101 | ACTB | Actin, beta |
| H02 | Hs.534255 | NM_004048 | B2M | Beta-2-microglobulin |
| H03 | Hs.592355 | NM_002046 | GAPDH | Glyceraldehyde-3-phosphate dehydrogenase |
| H04 | Hs.412707 | NM_000194 | HPRT1 | Hypoxanthine phosphoribosyltransferase 1 |
| H05 | Hs.546285 | NM_001002 | RPLP0 | Ribosomal protein, large, P0 |
| H06 | N/A | SA_00105 | HGDC | Human 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, 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 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 |
| RT² 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 |
| RT² 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.

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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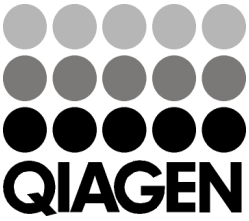


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