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

# Rat Hypoxia Signaling Pathway

### Cat. no. 330231 PARN-032ZR

### 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 Rat Hypoxia Signaling Pathway RT² Profiler PCR Array profiles the expression of 84 genes that respond to low oxygen levels. Oxygen is required for aerobic energy metabolism processes such as oxidative phosphorylation. Low oxygen conditions activate the hypoxia signaling pathway in eukaryotic cells, primarily via the hypoxia inducible factor (HIF) transcription factor. HIF heterodimers consist of a constitutively-expressed beta subunit and one of 3 alpha subunit isoforms whose expression is tightly regulated. The presence of oxygen activates prolyl hydroxylases to hydroxylate HIF, leading to its polyubiquitination and degradation. Under low oxygen conditions, prolyl hydroxylase inactivity allows HIF to accumulate, initiating target gene expression. Hypoxia-inducible target genes mediate multiple biological functions, such as angiogenesis, hematopoiesis, and the maintenance of vascular tone to provide or replenish tissues with blood and oxygen. Hypoxia signaling dysregulation commonly occurs in diseases such as tumor angiogenesis and chronic inflammation. Hundreds of HIF target genes have been identified using experimental techniques such as expression studies and chromatin immunoprecipitation (ChIP) as well as bioinformatic analysis of predicted transcription factor binding sites. This array includes HIF signaling transcription factors, HIF interacting proteins, and highly relevant target genes identified by multiple studies. Results obtained with this array can be used to analyze activation or inhibition of hypoxia signaling. Using real-time PCR, research studies can easily and reliably analyze the expression of a focused panel of genes related to the hypoxia signaling pathway 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 |
|---|---|---|---|---|
| A01 | Rn.10232 | NM_012715 | Adm | Adrenomedullin |
| A02 | Rn.89544 | NM_017161 | Adora2b | Adenosine A2B receptor |
| A03 | Rn.1774 | NM_012495 | Aldoa | Aldolase A, fructose-bisphosphate |
| A04 | Rn.119611 | NM_199115 | Angptl4 | Angiopoietin-like 4 |
| A05 | Rn.21120 | NM_001108400 | Ankrd37 | Ankyrin repeat domain 37 |
| A06 | Rn.90546 | NM_019905 | Anxa2 | Annexin A2 |
| A07 | Rn.5949 | NM_024148 | Apex1 | APEX nuclease (multifunctional DNA repair enzyme) 1 |
| A08 | Rn.10520 | NM_012780 | Arnt | Aryl hydrocarbon receptor nuclear translocator |
| A09 | Rn.81055 | NM_053328 | Bhlhe40 | Basic helix-loop-helix family, member e40 |
| A10 | Rn.211198 | NM_001107526 | Blm | Bloom syndrome, RecQ helicase-like |
| A11 | Rn.2060 | NM_053420 | Bnip3 | BCL2/adenovirus E1B interacting protein 3 |
| A12 | Rn.827 | NM_080888 | Bnip3l | BCL2/adenovirus E1B interacting protein 3-like |
| B01 | Rn.1000 | NM_017258 | Btg1 | B-cell translocation gene 1, anti-proliferative |
| B02 | Rn.162391 | NM_001107956 | Car9 | Carbonic anhydrase 9 |
| B03 | Rn.162246 | NM_001105725 | Ccng2 | Cyclin G2 |
| B04 | Rn.48717 | NM_031550 | Cdkn2a | Cyclin-dependent kinase inhibitor 2A |
| B05 | Rn.2243 | NM_001025695 | Cops5 | COP9 constitutive photomorphogenic homolog subunit 5 (Arabidopsis) |
| B06 | Rn.104631 | NM_001011959 | Ctsa | Cathepsin A |
| B07 | Rn.9775 | NM_080906 | Ddit4 | DNA-damage-inducible transcript 4 |
| B08 | Rn.100120 | NM_024161 | Dnajc5 | DnaJ (Hsp40) homolog, subfamily C, member 5 |
| B09 | Rn.10918 | NM_012548 | Edn1 | Endothelin 1 |
| B10 | Rn.44718 | XM_002725436 | Egln1 | EGL nine homolog 1 (C. elegans) |
| B11 | Rn.43384 | NM_001004083 | Egln2 | EGL nine homolog 2 (C. elegans) |
| B12 | Rn.9096 | NM_012551 | Egr1 | Early growth response 1 |
| C01 | Rn.11161 | NM_053857 | Eif4ebp1 | Eukaryotic translation initiation factor 4E binding protein 1 |
| C02 | Rn.4236 | NM_012554 | Eno1 | Enolase 1, (alpha) |
| C03 | Rn.11365 | NM_017001 | Epo | Erythropoietin |
| C04 | Rn.64648 | NM_138528 | Ero1l | ERO1-like (S. cerevisiae) |
| C05 | Rn.21393 | NM_017143 | F10 | Coagulation factor X |
| C06 | Rn.9980 | NM_013057 | F3 | Coagulation factor III (thromboplastin, tissue factor) |
| C07 | Rn.103750 | NM_022197 | Fos | FBJ osteosarcoma oncogene |
| C08 | Rn.84435 | NM_207592 | Gpi | Glucose phosphate isomerase |
| C09 | Rn.95278 | NM_001109615 | Gys1 | Glycogen synthase 1, muscle |
| C10 | Rn.10852 | NM_024359 | Hif1a | Hypoxia-inducible factor 1, alpha subunit (basic helix-loop-helix transcription factor) |
| C11 | Rn.83240 | NM_001113749 | Hif1an | Hypoxia-inducible factor 1, alpha subunit inhibitor |
| C12 | Rn.161814 | NM_022528 | Hif3a | Hypoxia inducible factor 3, alpha subunit |
| D01 | Rn.91375 | NM_012735 | Hk2 | Hexokinase 2 |
| D02 | Rn.3160 | NM_012580 | Hmox1 | Heme oxygenase (decycling) 1 |
| D03 | Rn.44442 | NM_022180 | Hnf4a | Hepatocyte nuclear factor 4, alpha |
| D04 | Rn.23638 | NM_212505 | Ier3 | Immediate early response 3 |
| D05 | Rn.26369 | NM_012588 | Igfbp3 | Insulin-like growth factor binding protein 3 |
| D06 | Rn.19923 | NM_001012143 | Jmjd6 | Jumonji domain containing 6 |
| D07 | Rn.107896 | NM_017025 | Ldha | Lactate dehydrogenase A |
| D08 | Rn.764 | NM_031832 | Lgals3 | Lectin, galactoside-binding, soluble, 3 |
| D09 | Rn.112309 | XM_346005 | LOC367198 | Similar to Serine/threonine-protein kinase ATR (Ataxia telangiectasia and Rad3-related protein) |
| D10 | Rn.11372 | NM_017061 | Lox | Lysyl oxidase |
| D11 | Rn.11081 | NM_053887 | Map3k1 | Mitogen activated protein kinase kinase kinase 1 |
| D12 | Rn.10617 | NM_031517 | Met | Met proto-oncogene |
| E01 | Rn.2661 | NM_031051 | Mif | Macrophage migration inhibitory factor |
| E02 | Rn.10209 | NM_031055 | Mmp9 | Matrix metallopeptidase 9 |
| E03 | Rn.37510 | NM_013160 | Mxi1 | MAX interactor 1 |
| E04 | Rn.203508 | NM_177928 | Nampt | Nicotinamide phosphoribosyltransferase |
| E05 | Rn.153992 | NM_001011991 | Ndrg1 | N-myc downstream regulated 1 |
| E06 | Rn.2411 | XM_342346 | Nfkb1 | Nuclear factor of kappa light polypeptide gene enhancer in B-cells 1 |
| E07 | Rn.44265 | NM_021838 | Nos3 | Nitric oxide synthase 3, endothelial cell |

| Position | UniGene | GenBank | Symbol | Description |
|---|---|---|---|---|
| E08 | Rn.874 | NM_012615 | Odc1 | Ornithine decarboxylase 1 |
| E09 | Rn.8531 | NM_172062 | P4ha1 | Prolyl 4-hydroxylase, alpha polypeptide I |
| E10 | Rn.4234 | NM_012998 | P4hb | Prolyl 4-hydroxylase, beta polypeptide |
| E11 | Rn.11185 | NM_053826 | Pdk1 | Pyruvate dehydrogenase kinase, isozyme 1 |
| E12 | Rn.34433 | NM_001034125 | Per1 | Period homolog 1 (Drosophila) |
| F01 | Rn.10791 | NM_057135 | Pfkfb3 | 6-phosphofructo-2-kinase/fructose-2,6-biphosphatase 3 |
| F02 | Rn.90092 | NM_019333 | Pfkfb4 | 6-phosphofructo-2-kinase/fructose-2,6-biphosphatase 4 |
| F03 | Rn.4212 | NM_013190 | Pfkl | Phosphofructokinase, liver |
| F04 | Rn.2278 | NM_206847 | Pfkp | Phosphofructokinase, platelet |
| F05 | Rn.1383 | NM_053290 | Pgam1 | Phosphoglycerate mutase 1 (brain) |
| F06 | Rn.6960 | NM_053595 | Pgf | Placental growth factor |
| F07 | Rn.108127 | NM_053291 | Pgk1 | Phosphoglycerate kinase 1 |
| F08 | Rn.203347 | NM_001106007 | Pgm2 | Phosphoglucomutase 2 |
| F09 | Rn.34888 | NM_017034 | Pim1 | Pim-1 oncogene |
| F10 | Rn.1556 | NM_053297 | Pkm2 | Pyruvate kinase, muscle |
| F11 | Rn.6064 | NM_013085 | Plau | Plasminogen activator, urokinase |
| F12 | Rn.219869 | NM_001108604 | Rbpjl | Recombination signal binding protein for immunoglobulin kappa J region-like |
| G01 | Rn.136577 | NM_001025405 | Ruvbl2 | RuvB-like 2 (E. coli) |
| G02 | Rn.29367 | NM_012620 | Serpine1 | Serpin peptidase inhibitor, clade E (nexin, plasminogen activator inhibitor type 1), member 1 |
| G03 | Rn.10826 | NM_030834 | Slc16a3 | Solute carrier family 16, member 3 (monocarboxylic acid transporter 4) |
| G04 | Rn.3205 | NM_138827 | Slc2a1 | Solute carrier family 2 (facilitated glucose transporter), member 1 |
| G05 | Rn.95055 | NM_017102 | Slc2a3 | Solute carrier family 2 (facilitated glucose transporter), member 3 |
| G06 | Rn.98672 | NM_022712 | Tfrc | Transferrin receptor |
| G07 | Rn.54443 | NM_030989 | Tp53 | Tumor protein p53 |
| G08 | Rn.37838 | NM_022922 | Tpi1 | Triosephosphate isomerase 1 |
| G09 | Rn.2758 | NM_001008767 | Txnip | Thioredoxin interacting protein |
| G10 | Rn.44637 | NM_031139 | Usf2 | Upstream transcription factor 2, c-fos interacting |
| G11 | Rn.54594 | NM_031353 | Vdac1 | Voltage-dependent anion channel 1 |
| G12 | Rn.1923 | NM_031836 | Vegfa | Vascular endothelial growth factor A |
| H01 | Rn.94978 | NM_031144 | Actb | Actin, beta |
| H02 | Rn.1868 | NM_012512 | B2m | Beta-2 microglobulin |
| H03 | Rn.47 | NM_012583 | Hprt1 | Hypoxanthine phosphoribosyltransferase 1 |
| H04 | Rn.107896 | NM_017025 | Ldha | Lactate dehydrogenase A |
| H05 | Rn.973 | NM_001007604 | Rplp1 | Ribosomal protein, large, P1 |
| H06 | N/A | U26919 | RGDC | Rat 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 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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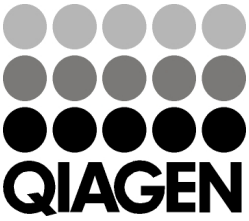


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