

RT² Profiler™ PCR Array:

Rat DNA Damage Signaling

Catalog Number

PARN-029A

PARN-029C

PARN-029D

PARN-029E

PARN-029F

PARN-029G

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 Rat DNA Damage Signaling Pathway RT² Profiler PCR Array profiles the expression of 84 genes involved in DNA damage signaling pathways. The genes featured are those associated with the ATR/ATM signaling network and transcriptional targets of DNA damage response. DNA damage can result in cell cycle arrest, apoptosis, and the stabilization and repair of the cellular genome. Using real-time PCR, you can easily and reliably analyze expression of a focused panel of genes related to DNA Damage Signaling with this array.

Functional Gene Groupings

Apoptosis: Atm, Brca1, LOC680915 (Mbd4), MGC116373 (Rad21), Mgmt, Mlh1, Prkdc, Tp53 (p53).

Cell Cycle:

Cell Cycle Arrest: Chek1, Gadd45a, LOC498411 (Hus1), Msh2.

Cell Cycle Checkpoint: Brca2, Rad1, Rad9, RGD1566025 (Pinx1), Smc111 (Smc1a).

Other Genes Related to the Cell Cycle: Atm, Cspd6 (Smc3), LOC363333 (Chaf1a), LOC685491 (Rbbp4), MGC116373 (Rad21), Rad17, Terf1, Tlk1.

DNA Repair:

Damaged DNA Binding: Brca1, Ercc1, Ercc2, H2afx, Msh2, Msh3, Rad1, Rad51, RGD1563765 (Rad51c), RGD1564823 (Xrcc2), Rad5111, Trpc2, Xpa, Xpc, Xrcc1.

Base-excision Repair: LOC680915 (Mbd4), Mpg, Mutyh, Nthl1, Ogg1, Parp1 (Adprt1), Parp2 (Adprt2), RGD1308665 (Mare).

Nucleotide-excision Repair: Dclre1a, Fancs, Nthl1, Rad23a, Slk, Xpa, Xpc.

Double-strand Break Repair: Brca2, H2afx, Mre11a, Prkdc, Rad52, Xrcc6 (G22p1).

Mismatch Repair: MGC72584 (Pms1), Mlh1, Mlh3, Msh2, Msh3, Pms2, Pold3, Trex1.

Other Genes Related to DNA Repair: Apex1, Atm, Atrx, Cry2, Cspd6 (Smc3), Exo1, Fen1, Gtf2h1, Gtf2h2, Lig1, LOC363333 (Chaf1a), LOC685491 (Rbbp4), LOC691105 (Fancg), Mgmt, Mif, Pold1, Pole, Polh, Poli, Polk, Pttg1, Rad17, Rad18, MGC116373 (Rad21), Rad50, Rad9, Rad9b, Rbm4, Rev1l, Smc111 (Smc1a), Srd5a2, Sumo1, Tdg, Tnp1, Ube2a, Ung, Wrn, Wrnip1, Xrn2.

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. Tran H, Brunet A, Grenier JM, Datta SR, Fornace AJ Jr, DiStefano PS, Chiang LW, Greenberg ME. DNA repair pathway stimulated by the forkhead transcription factor FOXO3a through the Gadd45 protein. *Science* 2002 Apr 19; **296** (5567): 530-4
2. Tusher VG, Tibshirani R, Chu G. Significance analysis of microarrays applied to the ionizing radiation response. *Proc Natl Acad Sci U S A* 2001 Apr 24; **98** (9): 5116-21
3. Li Z, Li JJ. Effector genes altered in mcf-7 human breast cancer cells after exposure to fractionated ionizing radiation. *Radiat Res.* 2001 Apr; **155** (4): 543-53.
4. RoblesAI, Bemmels NA, Foraker AB, Harris CC. APAF-1 is a transcriptional target of p53 in DNA damage-induced apoptosis. *Cancer Res* 2001 Sep 15; **61** (18): 6660-4
5. Kannan K, Amariglio N, Rechavi G, Jakob-Hirsch J, Kela I, Kaminski N, Getz G, Domany E, Givol D. DNA microarrays identification of primary and secondary target genes regulated by p53. *Oncogene* 2001 Apr 26; **20** (18): 2225-34
6. Zhou BB, Elledge SJ. The DNA damage response: putting checkpoints in perspective. *Nature* 2000 Nov 23; **408** (6811): 433-9
7. Bartek J, Lukas J. Mammalian G1- and S-phase checkpoints in response to DNA damage. *Curr Opin Cell Biol* 2001 Dec; **13** (6): 738-47
8. Carr AM. Cell cycle. Piecing together the p53 puzzle. *Science* 2000 Mar 10; **287** (5459): 1765-6
9. MacLachlan TK, Somasundaram K, Sgagias M, Shifman Y, Muschel RJ, Cowan KH, El-Deiry WS. BRCA1 effects on the cell cycle and the DNA damage response are linked to altered gene expression. *J Biol Chem* 2000 Jan 28; **275** (4): 2777-85
10. Yu J, Zhang L, Hwang PM, Rago C, Kinzler KW, Vogelstein B. Identification and classification of p53-regulated genes. *Proc Natl Acad Sci U S A* 1999 Dec 7; **96** (25): 14517-22

Product Specification Sheet

Array Layout: Rat DNA Damage Signaling Pathway PCR Array

	1	2	3	4	5	6	7	8	9	10	11	12
A	Apex1	Atm	Atrx	Brca1	Brca2	Chek1	Cry2	Cspg6	Dclre1a	Ercc1	Ercc2	Exo1
B	Fancc	Fen1	Gadd45a	Gtf2h1	Gtf2h2	H2afx	Lig1	LOC363333	LOC498411	LOC680915	LOC685491	LOC691105
C	MGC116373	MGC72584	Mgmt	Mif	Mlh1	Mlh3	Mpg	Mre11a	Msh2	Msh3	Mutyh	Nth1
D	Ogg1	Parp1	Parp2	Pms2	Pold1	Pold3	Pole	Polh	Poli	Polk	Prkdc	Pttg1
E	Rad1	Rad17	Rad18	Rad23a	Rad50	Rad51	Rad5111	Rad52	Rad9	Rad9b	Rbm4	Rev11
F	RGD1308665	RGD1563765	RGD1564823	RGD1566025	Slk	Smc11	Srd5a2	Sumo1	Tdg	Terf1	Tlk1	Tnp1
G	Tp53	Trex1	Trpc2	Ube2a	Ung	Wrm	Wrmip1	Xpa	Xpc	Xrcc1	Xrcc6	Xrn2
H	Rplp1	Hprt	Rpl13a	Ldha	Actb	RGDC	RTC	RTC	RTC	PPC	PPC	PPC

Gene Table

Position	UniGene	GenBank	Symbol	Description
A01	Rn.5949	NM_024148	Apex1	Apurinic/apyrimidinic endonuclease 1
A02	Rn.98962	XM_236275	Atm	Ataxia telangiectasia mutated homolog (human) (mapped)
A03	Rn.107838	XM_217570	Atrx	Alpha thalassemia/mental retardation syndrome X-linked homolog (human)
A04	Rn.48840	NM_012514	Brca1	Breast cancer 1
A05	Rn.103225	NM_031542	Brca2	Breast cancer 2
A06	Rn.33267	NM_080400	Chek1	Checkpoint kinase 1 homolog (S. pombe)
A07	Rn.21150	NM_133405	Cry2	Cryptochrome 2 (photolyase-like)
A08	Rn.11074	NM_031583	Cspg6	Chondroitin sulfate proteoglycan 6
A09	Rn.41244	XM_214730	Dclre1a_predicted	DNA cross-link repair 1A, PSO2 homolog (S. cerevisiae) (predicted)
A10	Rn.7320	XM_214833	Ercc1_predicted	Excision repair cross-complementing rodent repair deficiency, complementation group 1 (predicted)
A11	Rn.74906	XM_218424	Ercc2	Similar to nucleotide excision repair protein (LOC308415), mRNA
A12	Rn.52638	XM_222932	Exo1_predicted	Exonuclease 1 (predicted)
B01	Rn.10798	NM_012557	Fancc	Fanconi anemia, complementation group C
B02	Rn.16664	NM_053430	Fen1	Flap structure-specific endonuclease 1
B03	Rn.10250	NM_024127	Gadd45a	Growth arrest and DNA-damage-inducible 45 alpha
B04	Rn.24733	XM_341863	Gtf2h1_predicted	General transcription factor II H, polypeptide 1 (predicted)
B05	Rn.144260	XM_215466	Gtf2h2_predicted	General transcription factor II H, polypeptide 2 (predicted)
B06	Rn.129301	NM_199388	H2afx	Dolichyl-phosphate (UDP-N-acetylglucosamine) N-acetylglucosaminophosphotransferase 1 (GlcNAc-1-P transferase)
B07	Rn.20467	NM_030855	Lig1	Ligase I, DNA, ATP-dependent
B08	Rn.12758	XM_343671	LOC363333	Similar to Chromatin assembly factor 1 subunit A (CAF-1 subunit A) (Chromatin assembly factor I p150 subunit) (CAF-I 150 kDa subunit) (CAF-Ip150)
B09	Rn.64290	XM_573658	LOC498411	Similar to Hus1 homolog
B10	Rn.179073	XM_001059437	LOC680915	Similar to Methyl-CpG-binding domain protein 4 (Methyl-CpG-binding protein MBD4) (Mismatch-specific DNA N-glycosylase)
B11	Rn.7745	XM_001061612	LOC685491	Similar to retinoblastoma binding protein 4
B12	Rn.198713	XM_001076851	LOC691105	Similar to Fanconi anemia, complementation group G
C01	Rn.92781	NM_001025701	MGC116373	Similar to HR23spA
C02	Rn.47945	NM_001009535	MGC72584	Similar to postmeiotic segregation increased 1
C03	Rn.9836	NM_012861	Mgmt	O-6-methylguanine-DNA methyltransferase
C04	Rn.2661	NM_031051	Mif	Macrophage migration inhibitory factor
C05	Rn.20391	NM_031053	Mlh1	MutL homolog 1 (E. coli)
C06	Rn.119254	XM_234420	Mlh3_predicted	MutL homolog 3 (E. coli) (predicted)
C07	Rn.11241	NM_012601	Mpg	N-methylpurine-DNA glycosylase
C08	Rn.54477	NM_022279	Mre11a	Meiotic recombination 11 homolog A (S. cerevisiae)
C09	Rn.3174	NM_031058	Msh2	MutS homolog 2 (E. coli)
C10	Rn.162551	XM_001065837	Msh3	MutS homolog 3 (E. coli)
C11	Rn.44045	NM_133316	Mutyh	MutY homolog (E. coli)
C12	Rn.14632	XM_213228	Nth1_predicted	Nth (endonuclease III)-like 1 (E.coli) (predicted)
D01	Rn.22623	NM_030870	Ogg1	8-oxoguanine DNA-glycosylase 1
D02	Rn.11327	NM_013063	Parp1	Poly (ADP-ribose) polymerase family, member 1

Product Specification Sheet

Position	UniGene	GenBank	Symbol	Description
D03	Rn.22730	XM_214157	Parp2_predicted	Poly (ADP-ribose) polymerase family, member 2 (predicted)
D04	Rn.102072	XM_213712	Pms2_predicted	Postmeiotic segregation increased 2 (S. cerevisiae) (predicted)
D05	Rn.88690	NM_021662	Pold1	Polymerase (DNA directed), delta 1, catalytic subunit
D06	Rn.162469	NM_001024750	Pold3	Polymerase (DNA-directed), delta 3, accessory subunit
D07	Rn.40977	XM_222255	Pole	Polymerase (DNA directed), epsilon (mapped)
D08	Rn.53711	XM_236934	Polh_predicted	Polymerase (DNA directed), eta (RAD 30 related) (predicted)
D09	Rn.136855	XM_225844	Poli_predicted	Polymerase (DNA directed), iota (predicted)
D10	Rn.92419	XM_342178	Polk	Polymerase (DNA directed) kappa
D11	Rn.24110	XM_341020	Prkdc_predicted	Protein kinase, DNA activated, catalytic polypeptide (predicted)
D12	Rn.271	NM_022391	Pttg1	Pituitary tumor-transforming 1
E01	Rn.27018	XM_215497	Rad1_predicted	RAD1 homolog (S. pombe) (predicted)
E02	Rn.154275	NM_001024778	Rad17	RAD17 homolog (S. pombe)
E03	Rn.139798	XM_342734	Rad18_predicted	RAD18 homolog (S. cerevisiae) (predicted)
E04	Rn.105419	NM_001013190	Rad23a	RAD23a homolog (S. cerevisiae)
E05	Rn.51136	NM_022246	Rad50	RAD50 homolog (S. cerevisiae)
E06	Rn.103858	XM_230465	Rad51_predicted	RAD51 homolog (S. cerevisiae) (predicted)
E07	Rn.124221	BM391876	Rad5111	Transcribed locus, strongly similar to NP_033040.2 RAD51-like 1 (S. cerevisiae) [Mus musculus]
E08	Rn.8154	XM_216230	Rad52_predicted	RAD52 homolog (S. cerevisiae) (predicted)
E09	Rn.145016	XM_219684	Rad9_predicted	RAD9 homolog (S. pombe) (predicted)
E10	Rn.41386	NM_001030042	Rad9b	RAD9 homolog B (S. cerevisiae)
E11	Rn.8556	XM_215201	Rbm4_predicted	RNA binding motif protein 4 (predicted)
E12	Rn.94641	XM_237071	Rev11_predicted	REV1-like (S. cerevisiae) (predicted)
F01	Rn.22962	NM_001034936	RGD1308665	Similar to CGTHBA protein (-14 gene protein)
F02	Rn.160309	XM_001081158	RGD1563765_predicted	Similar to RAD51L2/RAD51C protein (predicted)
F03	Rn.161762	XM_575317	RGD1564823_predicted	Similar to DNA-repair protein XRCC2 (X-ray repair cross-complementing protein 2) (predicted)
F04	Rn.15365	XM_224282	RGD1566025_predicted	Similar to Pin2-interacting protein X1 (predicted)
F05	Rn.33275	NM_019349	Slk	Serine/threonine kinase 2
F06	Rn.11763	NM_031683	Smc111	Structural maintenance of chromosomes 1 like 1 (S. cerevisiae)
F07	Rn.9938	NM_022711	Srd5a2	Steroid 5-alpha-reductase 2
F08	Rn.1221	NM_001009672	Sumo1	SMT3 suppressor of mif two 3 homolog 1 (yeast)
F09	Rn.98685	NM_053729	Tdg	Thymine-DNA glycosylase
F10	Rn.33853	NM_001012464	Terf1	Telomeric repeat binding factor 1
F11	Rn.6114	XM_242032	Tlk1_predicted	Tousled-like kinase 1 (predicted)
F12	Rn.9959	NM_017056	Tnp1	Transition protein 1
G01	Rn.54443	NM_030989	Tp53	Tumor protein p53
G02	Rn.98617	XM_001055797	Trex1	Three prime repair exonuclease 1
G03	Rn.48766	NM_022638	Trpc2	Transient receptor potential cation channel, subfamily C, member 2
G04	Rn.8585	NM_001013933	Ube2a	Ubiquitin-conjugating enzyme E2A, RAD6 homolog (S. cerevisiae)
G05	Rn.104379	NM_001013124	Ung	Uracil-DNA glycosylase
G06	Rn.144144	XM_214361	Wrn_predicted	Werner syndrome (predicted)
G07	Rn.8783	NM_172332	Wrip1	Werner helicase interacting protein 1
G08	Rn.12469	XM_216403	Xpa_predicted	Xeroderma pigmentosum, complementation group A (predicted)
G09	Rn.22820	XM_232194	Xpc_predicted	Xeroderma pigmentosum, complementation group C (predicted)
G10	Rn.13754	NM_053435	Xrcc1	X-ray repair complementing defective repair in Chinese hamster cells 1
G11	Rn.161996	NM_139080	Xrcc6	X-ray repair complementing defective repair in Chinese hamster cells 6
G12	Rn.64021	XM_342535	Xrn2_predicted	5'-3' exonuclease 2 (predicted)
H01	Rn.973	NM_001007604	Rplp1	Similar to 60S ACIDIC RIBOSOMAL PROTEIN P1
H02	Rn.47	NM_012583	Hprt	Hypoxanthine guanine phosphoribosyl transferase
H03	Rn.92211	NM_173340	Rpl13a	Ribosomal protein L13A
H04	Rn.107896	NM_017025	Ldha	Lactate dehydrogenase A
H05	Rn.94978	NM_031144	Actb	Actin, beta
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