

Oligo GEMArray[®] DNA Microarray: Mouse DNA Damage Signaling Pathway

Catalog Number

OMM-029
EMM-029

Format:

HybTube (Standard protocol)
HybPlate (Higher throughput protocol)

Description

The Oligo GEMArray[®] Mouse DNA Damage Signaling Pathway Microarray profiles the expression of 113 genes involved in DNA damage signaling pathways. The genes associated with the ATR / ATM signaling network and transcriptional targets of DNA damage response are included on this array. Genes related to cell cycle arrest, apoptosis, and the stabilization and repair of the cellular genome as a result of DNA damage signaling are represented as well. Through a simple side-by-side hybridization experiment you can determine differential gene expression between your samples with this array.

Functional Gene Groupings

Apoptosis: Atm, Brca1, Mbd4, Mgmt, Mlh1, Prkdc, Rad21, Trp53.

Cell Cycle:

Cell Cycle Arrest: Chek1, Gadd45a, Hus1, Msh2.

Cell cycle checkpoint: 2610028A01Rik (Pinx1), Brca2, Rad1, Rad9, Smc111.

Other Genes Related to the Cell Cycle: Atm, Chaf1a, Chaf1b, Cspg6, Dmc1h, Rad17, Rad21, Rbbp4, Terf1, Terf2, Tik1, Tik2.

DNA Repair:

Damaged DNA Binding: Brca1, Dmc1h, Ercc1, H2afx, Msh2, Msh3, Msh4, Msh5, Msh6, Rad1, Rad51, Rad51c, Rad51I1, Rad51I3, Trpc2, Xpa, Xpc, Xrcc1, Xrcc2, Xrcc3.

Base-excision Repair: Mre11a, Mpg, Mutyh, Nthl1, Ogg1, Parp1 (Adprt1), Parp2 (AdprtI2), Rad51I3.

Nucleotide-excision Repair: Dclre1a, Ercc2, Ercc3, Ercc5, Fancc, Nthl1, Poll, Rad23a, Rad23b, Slk, Xpa, Xpc.

Double-strand break Repair: Brca2, H2afx, Mre11a, Prkdc, Rad52, Xrcc4, Xrcc5, Xrcc6 (G22p1).

Mismatch Repair: Mlh1, Mlh3, Msh2, Msh3, Msh4, Msh5, Msh6, Pms1, Pms2, Pold3, Trex1.

Other Genes Related to DNA Repair: Apex1, Apex2, Atm, Atrx, Chaf1a, Chaf1b, Cry1, Cry2, Cspg6, Ercc4, Exo1, Fancg, Fancl, Fen1, Gtf2h1, Gtf2h2, Gtf2h4, Lig1, Lig3, Lig4, Mgmt, Mif, Neil1, Pold1, Pole, Polh, Poli, Polk, Polq, Pttg1, Rad17, Rad18, Rad21, Rad50, Rad54l, Rad9, Rad9b, Rbbp4, Rbm4 (Rbm14), Rev1l, Rev3l, Smc111, Srd5a2, Sumo1, Tdg, Tnp1, Ube2a, Ube2b, Ube2n, Ung, Wrn, Wrnip1, Xab2, Xrn2.

Storage Conditions

Please check the kit components immediately after you receive this package. SuperArray is only responsible for missing items reported within two (2) business days of receipt.

GEMArray microarrays are shipped at ambient temperature enclosed in either a HybTube or ExpressPak Storage Box. They should be stored at -20°C upon receipt.

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

Oligo GEArray[®] Mouse DNA Damage Signaling Pathway Microarray

Array Layout:

Gapdh 1	Parp1 2	Parp2 3	Anex1 4	Anex2 5	Atm 6	Atrx 7	Brcr1 8
Brcr2 9	Chaf1a 10	Chaf1b 11	Chek1 12	Crv1 13	Crv2 14	Cspg6 15	Dclre1a 16
Dmc1h 17	Ercc1 18	Ercc2 19	Ercc3 20	Ercc4 21	Ercc5 22	Exo1 23	Fancc 24
Fancc 25	Fancl 26	Fen1 27	Xrcc6 28	Gadd45a 29	Gtf2h1 30	Gtf2h2 31	Gtf2h4 32
H2afx 33	Hus1 34	Lig1 35	Lig3 36	Lig4 37	Mare 38	Mbd4 39	Mgmt 40
Mif 41	Mlh1 42	Mlh3 43	Mpo 44	Mre11a 45	Msh2 46	Msh3 47	Msh4 48
Msh5 49	Msh6 50	Mutvh 51	Neil1 52	Nth1 53	Ogg1 54	2610028A01Rik 55	Pms1 56
Pms2 57	Pold1 58	Pold3 59	Pole 60	Polh 61	Polj 62	Polk 63	Poll 64
Pola 65	Prkdc 66	Pttd1 67	Rad1 68	Rad17 69	Rad18 70	Rad21 71	Rad23a 72
Rad23b 73	Rad50 74	Rad51 75	Rad51c 76	Rad511 77	Rad513 78	Rad52 79	Rad54 80
Rad9 81	Rad9b 82	Rbbp4 83	Rbm4 84	Rev1 85	Rev3 86	Slk 87	Smc11 88
Srd5a2 89	Sumo1 90	Tda 91	Terf1 92	Terf2 93	Tlk1 94	Tlk2 95	Tnp1 96
Trex1 97	Tro53 98	Trpc2 99	Ube2a 100	Ube2b 101	Ube2n 102	Uno 103	Wrm 104
Wrm1 105	Xab2 106	Xoa 107	Xoc 108	Xrcc1 109	Xrcc2 110	Xrcc3 111	Xrcc4 112
Xrcc5 113	Xrn2 114	PUC18 115	Blank 116	Blank 117	AS1R2 118	AS1R1 119	AS1 120
Ros27a 121	B2m 122	Hspcb 123	Hscpb 124	Poia 125	Poia 126	BAS2C 127	BAS2C 128

Gene Table

Position	UniGene	GenBank	Symbol	Description	Gene Name
1	Mm.333399	NM_008084	Gapdh	Glyceraldehyde-3-phosphate dehydrogenase	Gapd
2	Mm.277779	NM_007415	Parp1	Poly (ADP-ribose) polymerase family, member 1	5830444G2Rik/AI893648
3	Mm.281482	NM_009632	Parp2	Poly (ADP-ribose) polymerase family, member 2	Adprt2/Adprt2
4	Mm.203	NM_009687	Apex1	Apurinic/aprimidinic endonuclease 1	APE/Apex
5	Mm.34884	NM_029943	Apex2	Apurinic/aprimidinic endonuclease 2	C430040P13Rik/ape2
6	Mm.5088	NM_007499	Atm	Ataxia telangiectasia mutated homolog (human)	AI256621/C030026E19Rik
7	Mm.10141	NM_009530	Atrx	Alpha thalassemia/mental retardation syndrome X-linked homolog (human)	ATR2/DXHX56677E
8	Mm.244975	NM_009764	Brcr1	Breast cancer 1	BRCA1
9	Mm.236256	NM_009765	Brcr2	Breast cancer 2	AI256696/AW045498
10	Mm.358656	NM_013733	Chaf1a	Chromatin assembly factor 1, subunit A (p150)	AL023013/AL024058
11	Mm.274222	NM_028083	Chaf1b	Chromatin assembly factor 1, subunit B (p60)	2600017H24Rik/C76145
12	Mm.16753	NM_007691	Chek1	Checkpoint kinase 1 homolog (S. pombe)	C85740/Chk1
13	Mm.26237	NM_007771	Crv1	Cryptochrome 1 (photolyase-like)	AU020726/AU021000
14	Mm.254181	NM_009963	Crv2	Cryptochrome 2 (photolyase-like)	AV006279/D130054K12Rik
15	Mm.14910	NM_007790	Cspg6	Chondroitin sulfate proteoglycan 6	Bamacan/HCAP
16	Mm.2805	NM_018831	Dclre1a	DNA cross-link repair 1A, PSO2 homolog (S. cerevisiae)	2810043H12Rik/AU022226
17	Mm.2524	NM_010059	Dmc1h	Disrupted meiotic cDNA 1 homolog	Dmc1
18	Mm.280913	NM_007948	Ercc1	Excision repair cross-complementing rodent repair deficiency, complementation group 1	Ercc-1
19	Mm.36524	NM_007949	Ercc2	Excision repair cross-complementing rodent repair deficiency, complementation group 2	AA407812/AU020867
20	Mm.282335	NM_133658	Ercc3	Excision repair cross-complementing rodent repair deficiency, complementation group 3	Ercc-3/XPB
21	Mm.287837	NM_015769	Ercc4	Excision repair cross-complementing rodent repair deficiency, complementation group 4	AI606920/Xpf
22	Mm.2213	NM_011729	Ercc5	Excision repair cross-complementing rodent repair deficiency, complementation group 5	Xpg
23	Mm.283046	NM_012012	Exo1	Exonuclease 1	Msa
24	Mm.126106	NM_007985	Fancc	Fanconi anemia, complementation group C	BB116513/Facc
25	Mm.23122	NM_053081	Fanccg	Fanconi anemia, complementation group G	AU041407/Xrcc9
26	Mm.18875	NM_025923	Fancl	Fanconi anemia, complementation group L	2010322C19Rik/AW554273
27	Mm.2952	NM_007999	Fen1	Flap structure specific endonuclease 1	AW539437
28	Mm.288809	NM_010247	Xrcc6	X-ray repair complementing defective repair in Chinese hamster cells 6	70kDa/G22p1
29	Mm.72235	NM_007836	Gadd45a	Growth arrest and DNA-damage-inducible 45 alpha	AA545191/Ddit1
30	Mm.22700	NM_008186	Gtf2h1	General transcription factor II H, polypeptide 1	62kDa/AW743425
31	Mm.272533	NM_022011	Gtf2h2	General transcription factor II H, polypeptide 2	44kDa/Bif2p44
32	Mm.10182	NM_010364	Gtf2h4	General transcription factor II H, polypeptide 4	AW545633/TFIIH
33	Mm.245931	NM_010436	H2afx	H2A histone family, member X	AW228881/H2A.X
34	Mm.42201	NM_008316	Hus1	Hus1 homolog (S. pombe)	mHus1
35	Mm.288179	NM_010715	Lig1	Ligase I, DNA, ATP-dependent	AL033288/LigI
36	Mm.277136	NM_010716	Lig3	Ligase III, DNA, ATP-dependent	D11Wsu78e
37	Mm.80584	NM_176953	Lig4	Ligase IV, DNA, ATP-dependent	5830471N16Rik
38	Mm.263161	NM_181569	Mare	Alpha globin regulatory element containing gene	Aag/CGTHBA
39	Mm.259308	NM_010774	Mbd4	Methyl-CpG binding domain protein 4	Med1
40	Mm.71906	NM_008598	Mgmt	O-6-methylguanine-DNA methyltransferase	AGT/AI267024
41	Mm.2326	NM_010798	Mif	Macrophage migration inhibitory factor	GIF/Gif
42	Mm.196006	NM_026810	Mlh1	MutL homolog 1 (E. coli)	1110035C23Rik/AI317206
43	Mm.311981	XM_484162	Mlh3	MutL homolog 3 (E. coli)	AV125803/BB126472
44	Mm.256299	NM_010822	Mpg	N-methylpurine-DNA glycosylase	983006D05/AI326268
45	Mm.149071	NM_018736	Mre11a	Meiotic recombination 11 homolog A (S. cerevisiae)	Mre11/Mre11b
46	Mm.4619	NM_008628	Msh2	MutS homolog 2 (E. coli)	AI788990
47	Mm.343101	NM_010829	Msh3	MutS homolog 3 (E. coli)	D13Em1/Rep-3

Product Specification Sheet

Position	UniGene	GenBank	Symbol	Description	Gene Name
48	Mm.272226	NM_031870	Msh4	MutS homolog 4 (E. coli)	4930485C04Rik/AV144863
49	Mm.24192	NM_013600	Msh5	MutS homolog 5 (E. coli)	G7/Mut5
50	Mm.18210	NM_010830	Msh6	MutS homolog 6 (E. coli)	AU044881/AW550279
51	Mm.180333	NM_133250	Mutyh	MutY homolog (E. coli)	5730495A01Rik/Mutyha
52	Mm.35749	NM_028347	Nei1	Nei endonuclease VIII-like 1 (E. coli)	2810450N13Rik/Nei1
53	Mm.148315	NM_008743	Nth1	Nth (endonuclease III)-like 1 (E. coli)	Nth1/Ocfs3
54	Mm.43612	NM_010957	Ogg1	8-oxoguanine DNA-glycosylase 1	Mmh
55	Mm.379214	NM_028228	2610028A01Rik	RIKEN cDNA 2610028A01 gene	2210403116Rik/67-11-3
56	Mm.60499	NM_153556	Pms1	Postmeiotic segregation increased 1 (S. cerevisiae)	MGC36491
57	Mm.2950	NM_008886	Pms2	Postmeiotic segregation increased 2 (S. cerevisiae)	AW555130/Pms2
58	Mm.16549	NM_011131	Pold1	Polymerase (DNA directed), delta 1, catalytic subunit	125kDa
59	Mm.37562	NM_133692	Pold3	Polymerase (DNA directed), delta 3, accessory subunit	2410142G14Rik/C85233
60	Mm.35061	NM_011132	Pole	Polymerase (DNA directed), epsilon	POLE
61	Mm.311585	NM_030715	Polh	Polymerase (DNA directed), eta (RAD 30 related)	RAD30A/XPV
62	Mm.244352	NM_011972	Poli	Polymerase (DNA directed), iota	Rad30b
63	Mm.89926	NM_012048	Polk	Polymerase (DNA directed), kappa	Dinb1
64	Mm.46509	NM_020032	Poll	Polymerase (DNA directed), lambda	1110003P06Rik/AV007317
65	Mm.259114	NM_029977	Polq	Polymerase (DNA directed), theta	A430110D14Rik
66	Mm.71	NM_011159	Prkdc	Protein kinase, DNA activated, catalytic polypeptide	A1326420/AU019811
67	Mm.6856	NM_013917	Pttg1	Pituitary tumor-transforming 1	AW555095/C87862
68	Mm.38376	NM_011232	Rad1	RAD1 homolog (S. pombe)	RAD1
69	Mm.248489	NM_011233	Rad17	RAD17 homolog (S. pombe)	9430035O09Rik/MmRad24
70	Mm.103812	NM_021385	Rad18	RAD18 homolog (S. cerevisiae)	2810024C04Rik/Rad18sc
71	Mm.182628	NM_009009	Rad21	RAD21 homolog (S. pombe)	SCC1/mKIAA0078
72	Mm.255539	NM_009010	Rad23a	RAD23a homolog (S. cerevisiae)	2310040P19Rik/AL024030
73	Mm.196846	NM_009011	Rad23b	RAD23b homolog (S. cerevisiae)	0610007D13Rik/AV001138
74	Mm.4888	NM_009012	Rad50	RAD50 homolog (S. cerevisiae)	Mrell/Rad50I
75	Mm.231	NM_011234	Rad51	RAD51 homolog (S. cerevisiae)	AV304093/Rad51a
76	Mm.37376	NM_053269	Rad51c	Rad51 homolog c (S. cerevisiae)	Rad51J
77	Mm.341756	NM_009014	Rad51I1	RAD51-like 1 (S. cerevisiae)	A153500/R51H2
78	Mm.9286	NM_011235	Rad51I3	RAD51-like 3 (S. cerevisiae)	DKFZ5686D0122/R51H3
79	Mm.149	NM_011236	Rad52	RAD52 homolog (S. cerevisiae)	Rad52yh
80	Mm.3655	NM_009015	Rad54I	RAD54 like (S. cerevisiae)	RAD54
81	Mm.277629	NM_011237	Rad9	RAD9 homolog (S. pombe)	RAD9
82	Mm.320090	NM_144912	Rad9b	RAD9 homolog B (S. cerevisiae)	A630082N15Rik/BC021784
83	Mm.12145	NM_009030	Rbbp4	Retinoblastoma binding protein 4	mRbAp48
84	Mm.300225	NM_009032	Rbm4	RNA binding motif protein 4	4921506I22Rik/Mlark
85	Mm.259294	NM_019570	Rev1I	REV1-like (S. cerevisiae)	1110027I23Rik/AU022044
86	Mm.288788	NM_011264	Rev3I	REV3-like, catalytic subunit of DNA polymerase zeta RAD54 like (S. cerevisiae)	Rev/Rev3
87	Mm.281011	NM_009289	Slk	STE20-like kinase (yeast)	9A2/AV021402
88	Mm.26412	NM_019710	Smc1I1	SMC (structural maintenance of chromosomes 1)-like 1 (S. cerevisiae)	5830426I2Rik/SMCB
89	Mm.38933	NM_053188	Srd5a2	Steroid 5 alpha-reductase 2	5ART2
90	Mm.259278	NM_009460	Sumo1	SMT3 suppressor of mif two 3 homolog 1 (yeast)	GMP1/PIC1
91	Mm.284252	NM_011561	Tdq	Thymine DNA glycosylase	E130317C12Rik/JZA-3
92	Mm.4306	NM_009352	Terr1	Telomeric repeat binding factor 1	Pin2/Trbf1
93	Mm.6402	NM_009353	Terr2	Telomeric repeat binding factor 2	TRF2
94	Mm.136511	NM_172664	Tlk1	Tousled-like kinase 1	4930545J15Rik
95	Mm.126976	NM_011903	Tlk2	Tousled-like kinase 2 (Arabidopsis)	PkUalpha/Tlk
96	Mm.661	NM_009407	Tnp1	Transition protein 1	Stp-1/TP1
97	Mm.262117	NM_011637	Trex1	Three prime repair exonuclease 1	1661/AU041952
98	Mm.222	NM_011640	Trp53	Transformation related protein 53	bb/bfy
99	Mm.292904	NM_011644	Trpc2	Transient receptor potential cation channel, subfamily C, member 2	TRPC2a/TRPC2b
100	Mm.172835	NM_019668	Ube2a	Ubiquitin-conjugating enzyme E2A, RAD6 homolog (S. cerevisiae)	HHR6A/HRA6
101	Mm.280233	NM_009458	Ube2b	Ubiquitin-conjugating enzyme E2B, RAD6 homolog (S. cerevisiae)	2610301N02Rik/E2-14k
102	Mm.371667	NM_080560	Ube2n	Ubiquitin-conjugating enzyme E2N	1500026J17Rik/AL022654
103	Mm.1393	NM_011677	Ung	Uracil DNA glycosylase	UNG1/UNG2
104	Mm.228805	NM_011721	Wm	Werner syndrome homolog (human)	A1846146
105	Mm.286680	NM_030215	Wrmj1	Werner helicase interacting protein 1	4833444L21Rik/WHIP
106	Mm.23739	NM_026156	Xab2	XPA binding protein 2	0610041O14Rik/AV025587
107	Mm.247036	NM_011728	Xpa	Xeroderma pigmentosum, complementation group A	A1573865/Xpac
108	Mm.2806	NM_009531	Xpc	Xeroderma pigmentosum, complementation group C	XPC
109	Mm.4347	NM_009532	Xrcc1	X-ray repair complementing defective repair in Chinese hamster cells 1	Xrcc-1
110	Mm.143767	NM_020570	Xrcc2	X-ray repair complementing defective repair in Chinese hamster cells 2	4921524O04Rik/8030409M04Rik
111	Mm.19082	NM_028875	Xrcc3	X-ray repair complementing defective repair in Chinese hamster cells 3	4432412E01Rik/A1182522
112	Mm.37531	NM_028012	Xrcc4	X-ray repair complementing defective repair in Chinese hamster cells 4	2310057B22Rik/AW413319
113	Mm.246952	NM_009533	Xrcc5	X-ray repair complementing defective repair in Chinese hamster cells 5	A1314015/Ku80
114	Mm.3065	NM_011917	Xrn2	5'-3' exonuclease 2	XRN2
115	N/A	L08752	PUC18	PUC18 Plasmid DNA	pUC18
116	Blank	Blank	Blank	Blank	
117	Blank	Blank	Blank	Blank	
118	N/A	N/A	AS1R2	Artificial Sequence 1 Related 2 (80% identity)(48/60)	N/A
119	N/A	N/A	AS1R1	Artificial Sequence 1 Related 1 (90% identity)(56/60)	N/A
120	N/A	N/A	AS1	Artificial Sequence 1	N/A
121	Mm.180003	NM_024277	Rps27a	Ribosomal protein S27a	Rps27a
122	Mm.163	NM_009735	B2m	Beta-2 microglobulin	BETA2-M/LY-M11
123	Mm.2180	NM_008302	Hspcb	Heat shock protein 1, beta	90KDA/HSPB4
124	Mm.2180	NM_008302	Hspcb	Heat shock protein 1, beta	90KDA/HSPB4
125	Mm.5246	NM_008907	Ppia	Peptidylprolyl isomerase A	2700098C05/CPHN
126	Mm.5246	NM_008907	Ppia	Peptidylprolyl isomerase A	2700098C05/CPHN
127	N/A	N/A	BAS2C	Biotinylated Artificial Sequence 2 Complementary sequence	N/A
128	N/A	N/A	BAS2C	Biotinylated Artificial Sequence 2 Complementary sequence	N/A