

Oligo GEMArray[®] DNA Microarray: Rat Cell Cycle

Catalog Number

ORN-020
ERN-020

Format:

HybTube (Standard protocol)
HybPlate (Higher throughput protocol)

Description

The Oligo GEMArray[®] Rat Cell Cycle Microarray profiles the expression of 112 genes key to cell cycle regulation. This array represents cyclin-dependent kinases (CDKs) involved in cell cycle progression and the proteins that regulate them. Cyclins, CDK inhibitors, CDK phosphatases, and CDK kinases are included. Also represented are genes essential for the DNA damage and mitotic spindle checkpoints and genes in the SCF and APC ubiquitin-conjugation complexes. Through a simple side-by-side hybridization experiment you can determine differential gene expression between your samples.

Functional Gene Groupings

G1 Phase and G1/S Transition: Camk2a, Camk2b, Camk2d, Camk2g, Cdc7, Cdk6, Cdkn3, Itgb1, Myb, Nfatc1, Ppp3ca, Taf10.

S Phase and DNA Replication: Mcm2, Mcm3, Mcm5, Mcm7, Mcmd4, Mcmd6, Mki67, Mre11a, Msh2, PcnA, Rad50, Rad51, Sumo1, Zrf2.

G2 Phase and G2/M Transition: Bccip, Ccng1, Cdk5r, Cdk7, Chek1, Dnm2, Ppm1d, Zrf2.

M Phase: Brca2, Ccna1, Ccnb1, Cdc20, Cdc25a, Cdc25b, Cdk2, Nek2, Nek3, Pes1, Prm2, Ran, Shc1, Smc111, Smc211, Stag1, Stag2, Terf1, Tnfsf5ip1, Wee1.

Cell Cycle Checkpoint and Cell Cycle Arrest: Ak1, Apbb1, Brca2, Casp3, Ccng2, Cdc34, Cdc6, Cdk5rap1, Cdk5rap3, Cdkn1a, Cdkn1b, Cdkn1c, Cdkn2a, Cdkn2c, Cdkn3, Chek1, Chek2, Ddit3, Dst, Gadd45a, Hus1, Inha, Mad2l1, Mad2l2, Mdm2, Msh2, Notch2, Pkd1, Pmp22, Ppm1d, Rad9, Sesn3, Sfn, Smc111, Tsg101.

Regulation of the Cell Cycle: Abl1, Brca2, Ccna1, Ccna2, Ccnb1, Ccnc, Ccnd1, Ccnd2, Ccnd3, Ccne2, Ccnf, Ccnh, Ccnt2, Cdc16, Cdc2a, Cdc37, Cdc45l, Cdk4, Cdk8, Cdkn1a, E2f1, E2f3, E2f4, E2f5, E2f6, Gadd45a, Itgb1, Mst1, Rad9, Ran, Rb1, Sfn, Shc1, Tfdp2, Tnfsf5ip1.

Negative Regulation of the Cell Cycle: Apbb1, Atm, Brca1, Casp3, Cdkn2a, Cdkn2b, Inha, Rbl1, Rbl2, Tp53, Trp63.

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. Nurse, P. (2000) A Long Twentieth Century Of The Cell Cycle And Beyond. *Cell* **100**: 71-80.
2. Sherr, C. J. and Roberts, J. M. (1999) CDK Inhibitors: Positive And Negative Regulators Of G1-Phase Progression. *Genes & Development* **13**: 1501-12.
3. Harbour, J. W. and Dean, D. C. (2000) Rb Function In Cell-Cycle Regulation And Apoptosis. *Nature Cell Biology* **2**: E65-7.
4. Deshaies, R. J. (1995) The Self-Destructive Personality Of A Cell Cycle In Transition. *Current Biology* **7**: 781-789.
5. Gardner R. D. and Burke D. J. (2000) The Spindle Checkpoint: Two Transition, Two Pathways. *Trends in Cell Biology* **10**: 154-8.
6. Dasika, G. K., Lin, S. C., Zhao, S., Sung, P., Tomkinson, A., and Lee, E. Y. (1999) DNA Damage-Induced Cell Cycle Checkpoints And DNA Strand Break Repair In Development And Tumorigenesis. *Oncogene* **18**: 7883-99.
7. Amati, B. and Vlach, J. (1999) Kip1 Meets SKP2: New Links in Cell-Cycle Control. *Nature Cell Biology* **1**: E91-3.
8. Muller, H. and Helin, K. (2000) The E2F Transcription Factors: Key Regulators of Cell Proliferation. *Biochim. Biophys. Acta* **1470**: M1-12.
9. Bottazzi, M. E. and Assoian, R. K. (1997) The Extracellular Matrix And Mitogenic Growth Factors Control G1 Phase Cyclins And Cyclin-Dependent Kinase Inhibitors. *Trends in Cell Biology* **7**: 348-352.
10. Sherr C. J. and Weber J. D. (2000) The ARF/p53 Pathway. *Curr Opin Genet. Dev* **10**: 94-99.

Product Specification Sheet

Oligo GEArray[®] Rat Cell Cycle Microarray

Array Layout:

Ppia 1	Abi1 2	Ak1 3	Apbb1 4	Atm 5	Bccip 6	Brca1 7	Brca2 8
Camk2a 9	Camk2b 10	Camk2d 11	Camk2g 12	Casp3 13	Ccna1 14	Ccna2 15	Ccnb1 16
Ccnc 17	Ccnd1 18	Ccnd2 19	Ccnd3 20	Ccne2 21	Ccnf 22	Ccng1 23	Ccng2 24
Ccnh 25	Ccnt2 26	Cdc16 27	Cdc20 28	Cdc25a 29	Cdc25b 30	Cdc2a 31	Cdc34 32
Cdc37 33	Cdc45l 34	Cdc6 35	Cdc7 36	Cdk2 37	Cdk4 38	Cdk5r 39	Cdk5rap1 40
Cdk5rap3 41	Cdk6 42	Cdk7 43	Cdk8 44	Cdkn1a 45	Cdkn1b 46	Cdkn1c 47	Cdkn2a 48
Cdkn2b 49	Cdkn2c 50	Cdkn3 51	Chek1 52	Chek2 53	Ddit3 54	Dnm2 55	Dst 56
E2f1 57	E2f3 58	E2f3 59	E2f5 60	E2f6 61	Gadd45a 62	Hus1 63	Inha 64
Itgb1 65	Mad2l1 66	Mad2l2 67	Mcm2 68	Mcm3 69	Mcm5 70	Mcm7 71	Mcmd4 72
Mcmd6 73	Mdm2 74	Mki67 75	Mre11a 76	Msh2 77	Mst1 78	Myb 79	Nek2 80
Nek3 81	Nfatc1 82	Notch2 83	Pcna 84	Pes1 85	Pkd1 86	Pmp22 87	Ppm1d 88
Ppp3ca 89	Ppm2 90	Rad50 91	Rad51 92	Rad9 93	Ran 94	Rb1 95	Rbl1 96
Rbl2 97	Sesn3 98	Sfn 99	Shc1 100	Smc1l1 101	Smc2l1 102	Stag1 103	Stag2 104
Sumo1 105	Taf10 106	Terf1 107	Tfdp2 108	Tnfsf5ip1 109	Tp53 110	Trp63 111	Tsg101 112
Wee1 113	Zrf2 114	PUC18 115	Blank 116	Blank 117	AS1R2 118	AS1R1 119	AS1 120
Rpl32 121	Ldha 122	Aldoa 123	Aldoa 124	Gapd 125	Gapd 126	BAS2C 127	BAS2C 128

Gene Table

Position	UniGene	GenBank	Symbol	Description	Gene Name
1	Rn.1463	NM_017101	Ppia	Peptidylprolyl isomerase A	CYCA
2	Rn.3105	AW141872	Abi1	Abelson murine leukemia viral (v-abl) oncogene homolog 1	c-abl
3	Rn.79537	NM_024349	Ak1	Adenylate kinase 1	Ak1
4	Rn.19953	NM_080478	Apbb1	Amyloid beta (A4) precursor protein-binding, family B, member 1	Apbb1
5	Rn.98962	XM_236275	Atm	Ataxia telangiectasia mutated homolog (human)	Atm
6	Rn.7853	XM_341947	Bccip	BRCA2 and CDKN1A interacting protein (predicted)	Bccip
7	Rn.48840	NM_012514	Brca1	Breast cancer 1	BRCA1
8	Rn.103225	NM_031542	Brca2	Breast cancer 2	Brca2
9	Rn.107499	NM_012920	Camk2a	Calcium/calmodulin-dependent protein kinase II alpha subunit	Camk2a
10	Rn.9743	NM_021739	Camk2b	Calcium/calmodulin-dependent protein kinase II beta subunit	Camk2b
11	Rn.87208	NM_012519	Camk2d	Calcium/calmodulin-dependent protein kinase II, delta	Camk2d
12	Rn.10961	NM_133605	Camk2g	Calcium/calmodulin-dependent protein kinase II gamma	Camk2g
13	Rn.10562	NM_012922	Casp3	Caspase 3	Casp3
14	Rn.137432	NM_001011949	Ccna1	Similar to Cyclin A1 (LOC295052), mRNA	LOC295052
15	Rn.13094	XM_342229	Ccna2	Cyclin A2	Ccna2
16	Rn.9232	NM_171991	Ccnb1	Cyclin B1	ccylin B
17	Rn.106758	XM_342812	Ccnc	Cyclin C	Ccnc
18	Rn.22279	NM_171992	Ccnd1	Cyclin D1	ccylin D1
19	Rn.96083	NM_022267	Ccnd2	Cyclin D2	ccylin D2
20	Rn.3483	NM_012766	Ccnd3	Cyclin D3	ccylin D3
21	Rn.99690	XM_342804	Ccne2	Similar to cyclin E2 (LOC362485), mRNA	LOC362485
22	Rn.15126	XM_340763	Ccnf	Cyclin F	Ccnf
23	Rn.5834	NM_012923	Ccng1	Cyclin G1	ccylin G
24	Rn.3989	XM_223270	Ccng2	Cyclin G2 (predicted)	Ccng2
25	Rn.23255	NM_052981	Ccnh	Cyclin H	ccylin H
26	Rn.21407	NM_222617	Ccnt2	Cyclin T2 (predicted)	Ccnt2
27	Rn.66098	BQ190245	Cdc16	CDC16 cell division cycle 16 homolog (S. cerevisiae) (predicted)	CDC16
28	Rn.9262	NM_171993	Cdc20	Cell division cycle 20 homolog (S. cerevisiae)	Cdc20
29	Rn.11390	NM_133571	Cdc25a	Cell division cycle 25 homolog A (S. cerevisiae)	Cdc25a
30	Rn.11312	NM_133572	Cdc25b	Cell division cycle 25 homolog B (S. cerevisiae)	Cdc25b
31	Rn.6934	NM_019296	Cdc2a	Cell division cycle 2 homolog A (S. pombe)	Cdc2a
32	Rn.2427	XM_216827	Cdc34	Cell division cycle 34 homolog (S. cerevisiae) (predicted)	Cdc34
33	Rn.17982	NM_053743	Cdc37	Cell division cycle 37 homolog (S. cerevisiae)	Cdc37
34	Rn.98535	BQ209535	Cdc45l	Similar to CDC45L (LOC287961), mRNA	Cdc45
35	Rn.99349	XM_340896	Cdc6	Cell division cycle 6 homolog (S. cerevisiae) (predicted)	Cdc6
36	Rn.136792	XM_341183	Cdc7	Cell division cycle 7 (S. cerevisiae) (predicted)	Cdc7
37	Rn.104460	NM_199501	Cdk2	Cyclin dependent kinase 2	Cdk2
38	Rn.6115	NM_053593	Cdk4	Cyclin-dependent kinase 4	Cdk4
39	Rn.11213	NM_053891	Cdk5r	Cyclin-dependent kinase 5, regulatory subunit 1 (p35)	Cdk5r
40	Rn.12997	NM_145721	Cdk5rap1	CDK5 regulatory subunit associated protein 1	Cdk5rap1
41	Rn.3727	NM_024488	Cdk5rap3	CDK5 regulatory subunit associated protein 3	C53

Product Specification Sheet

Position	UniGene	GenBank	Symbol	Description	Gene Name
42	Rn.53244	XM_342638	Cdk6	Cyclin-dependent kinase 6	Cdk6
43	Rn.98896	XM_215467	Cdk7	Cyclin-dependent kinase 7 (homolog of Xenopus MO15 cdk-activating kinase)	Cdk7
44	Rn.110146	XM_221887	Cdk8	Similar to Cell division protein kinase 8 (Protein kinase K35) (LOC304270), mRNA	Cdk8
45	Rn.10089	NM_080782	Cdkn1a	Cyclin-dependent kinase inhibitor 1A	Cdkn1a
46	Rn.29897	NM_031762	Cdkn1b	Cyclin-dependent kinase inhibitor 1B	Cdkn1b
47	Rn.92509	NM_182735	Cdkn1c	Cyclin-dependent kinase inhibitor 1C, p57	P57kip2
48	Rn.48717	NM_031550	Cdkn2a	Cyclin dependent kinase inhibitor 2A	Cdkn2a
49	Rn.105626	NM_130812	Cdkn2b	Cyclin-dependent kinase inhibitor 2B (p15, inhibits CDK4)	Cdkn2b
50	Rn.63865	NM_131902	Cdkn2c	Cyclin dependent kinase inhibitor 2C	Cdkn2c
51	Rn.107220	BQ201635	Cdkn3	Cyclin-dependent kinase inhibitor 3 (predicted)	CDKN3
52	Rn.33267	NM_080400	Chek1	Checkpoint kinase 1 homolog (S. pombe)	Chek1
53	Rn.18487	NM_053677	Chek2	Protein kinase Chk2	Rad53
54	Rn.11183	NM_024134	Ddit3	DNA-damage inducible transcript 3	Ddit3
55	Rn.11231	NM_013199	Drnm2	Dynamin 2	Drnm2
56	Rn.79807	XM_237042	Dst	Dystonin (predicted)	Dst
57	Rn.104942	XM_230765	E2f1	E2F transcription factor 1 (predicted)	LOC296297
58	Rn.73967	XM_214476	E2f3	Similar to E2f3 protein (LOC291105), mRNA	LOC291105
59	Rn.95251	XM_226441	E2f4	E2F transcription factor 4 (predicted)	E2F4
60	Rn.127928	XM_574892	E2f5	E2F transcription factor 5	E2f5
61	Rn.79506	XM_233986	E2f6	E2F transcription factor 6	E2f6
62	Rn.10250	NM_024127	Gadd45a	Growth arrest and DNA-damage-inducible 45 alpha	Gadd45a
63	Rn.64290	XM_344261	Hus1	Similar to Hus1 homolog (LOC364194), mRNA	LOC364194
64	Rn.8831	NM_012590	Inha	Inhibin alpha	Inha
65	Rn.25733	NM_017022	Itgb1	Integrin beta 1	Itgb1
66	Rn.14931	BQ194258	Mad21	MAD2 (mitotic arrest deficient, homolog)-like 1 (yeast) (predicted)	Mad21
67	Rn.27237	BM385138	Mad22	MAD2 mitotic arrest deficient-like 2 (yeast) (predicted)	Mad22
68	Rn.110839	XM_228861	Mcm2	Similar to Mcm2 protein	Mcm2
69	Rn.101621	XM_346381	Mcm3	Minichromosome maintenance deficient 3 (S. cerevisiae) (predicted)	Mcm3
70	Rn.100779	XM_226316	Mcm5	Minichromosome maintenance deficient 5, cell division cycle 46 (S. cerevisiae) (predicted)	Mcm5
71	Rn.113	NM_001004203	Mcm7	Minichromosome maintenance protein 7	Mcm7
72	Rn.8341	XM_227167	Mcm4	Mini chromosome maintenance deficient 4 homolog (S. cerevisiae)	Mcm4
73	Rn.33226	U17565	Mcm6	Mini chromosome maintenance deficient 6 (S. cerevisiae)	Mcm6
74	Rn.91829	XM_235169	Mdm2	Similar to mdm2 gene product (LOC314856), mRNA	LOC314856
75	Rn.129394	BQ196889	Mki67	Antigen identified by monoclonal antibody Ki-67 (predicted)	Mki67
76	Rn.54477	NM_022279	Mre11a	Meiotic recombination 11 homolog A (S. cerevisiae)	Mre11a
77	Rn.3174	NM_031058	Msh2	MutS homolog 2 (E. coli)	Msh2
78	Rn.10613	NM_024352	Mst1	E2F transcription factor 2	E2F2
79	Rn.63885	XM_344868	Myb	Similar to Myb protein P42POP	Myb
80	Rn.92358	XM_341173	Nek2	NIMA (never in mitosis gene a)-related expressed kinase 2	Nek2
81	Rn.45730	XM_224971	Nek3	NIMA (never in mitosis gene a)-related expressed kinase 3 (predicted)	Nek3
82	Rn.8800	XM_225713	Nfatc1	Similar to nuclear factor of activated T-cells, cytoplasmic, calcineurin-dependent 1	Nfatc1
83	Rn.65930	NM_024358	Notch2	Notch gene homolog 2, (Drosophila)	Notch2
84	Rn.223	NM_022381	Pcna	Proliferating cell nuclear antigen	Pcna
85	Rn.128522	XM_214069	Pes1	Similar to PES1 protein	Pes1
86	Rn.127770	XM_340765	Pkd1	Polycystic kidney disease 1 homolog	Pkd1
87	Rn.1476	NM_017037	Pmp22	Peripheral myelin protein 22	Pmp22
88	Rn.15540	XM_213418	Ppm1d	Similar to Protein phosphatase 1D magnesium-dependent, delta isoform (LOC287585), mRNA	LOC287585
89	Rn.6866	NM_017041	Ppp3ca	Protein phosphatase 3, catalytic subunit, alpha isoform	Ppp3ca
90	Rn.10404	NM_012873	Prm2	Protamine 2	Prm2
91	Rn.51136	NM_022246	Rad50	RAD50 homolog (S. cerevisiae)	Rad50
92	Rn.103858	XM_230465	Rad51	RAD51 homolog (S. cerevisiae) (predicted)	Rad51
93	Rn.106416	XM_219684	Rad9	RAD9 homolog (S. pombe) (predicted)	Rad9
94	Rn.107698	NM_053439	Ran	RAN, member RAS oncogene family	Ran
95	Rn.55115	D25233	Rb1	Retinoblastoma 1	Rb1
96	Rn.100645	XM_342560	Rbl1	Retinoblastoma-like 1 (p107) (predicted)	Rbl1
97	Rn.11020	NM_031094	Rbl2	Retinoblastoma-like 2	Rbl2
98	Rn.26994	XM_235825	Sesn3	Similar to Sestrin 3 (LOC315427), mRNA	LOC315427
99	Rn.41586	XM_232745	Sfn	Similar to 14-3-3 protein sigma (LOC313017), mRNA	LOC313017
100	Rn.119060	XM_342282	Shc1	SHC (Src homology 2 domain-containing) transforming protein 1	Shc1
101	Rn.11763	NM_031683	Smc11i	Structural maintenance of chromosomes 1 like 1 (S. cerevisiae)	Smc11i
102	Rn.94452	XM_342837	Smc21i	SMC2 structural maintenance of chromosomes 2-like 1 (yeast) (predicted)	Smc21i
103	Rn.11715	XM_236609	Stag1	Stromal antigen 1 (predicted)	Stag1
104	Rn.29288	XM_233108	Stag2	Similar to stromal antigen 2	Stag2
105	Rn.1221	BQ781902	Sumo1	SMT3 suppressor of mif two 3 homolog 1 (yeast) (predicted)	LOC301442
106	Rn.104887	XM_215028	Taf10	TAF10 RNA polymerase II, TATA box binding protein (TBP)-associated factor (predicted)	Taf10
107	Rn.33853	XM_238387	Terf1	Similar to telomeric repeat binding factor 1 (LOC297758), mRNA	LOC297758
108	Rn.29088	XM_217232	Tfdp2	Transcription factor Dp-2 (E2F dimerization partner 2) (predicted)	Tfdp2
109	Rn.12660	XM_214550	Tnfsf5ip1	Tumor necrosis factor superfamily, member 5-induced protein 1 (predicted)	Tnfsf5ip1
110	Rn.54443	NM_030989	Tp53	Tumor protein p53	Tp53
111	Rn.42907	NM_019221	Trp63	Transformation related protein 63	Trp63
112	Rn.7410	NM_181628	Tsg101	Tumor susceptibility gene 101	Tsg101
113	Rn.52281	XM_219264	Wee1	Wee 1 homolog (S. pombe) (predicted)	Wee1
114	Rn.11908	NM_053776	Zrf2	Zuotin related factor 2	Zrf2
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	Rn.110966	NM_013226	Rpl32	Ribosomal protein L32	Rpl32
122	Rn.107896	NM_017025	Ldha	Lactate dehydrogenase A	Ldha
123	Rn.1774	NM_012495	Aldoa	Aldolase A	Aldoa
124	Rn.1774	NM_012495	Aldoa	Aldolase A	Aldoa
125	Rn.91450	NM_017008	Gapd	Glyceraldehyde-3-phosphate dehydrogenase	Gapd
126	Rn.91450	NM_017008	Gapd	Glyceraldehyde-3-phosphate dehydrogenase	Gapd
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