

Oligo GEMArray[®] DNA Microarray:

Human Cell Cycle

Catalog Number

OHS-020
EHS-020

Format:

HybTube (Standard protocol)
HybPlate (Higher throughput protocol)

Description

The Oligo GEMArray[®] Human 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: ANAPC2, CCND1 (cyclin D1), CCNE1 (cyclin E1), CDC7, CDC34, CDK4, CDK6, CDKN1B (p27), CDKN1C (p57), CDKN3, CUL1, CUL2, CUL3, CUL4A, CUL5, E2F1, SKP2.

S Phase and DNA Replication; ABL1 (C-ABL), MCM2, MCM3, MCM4 (CDC21), MCM5 (CDC46), MCM6 (Mis5), MCM7 (CDC47), PCNA, RPA3, SUMO1, UBE1.

G2 Phase and G2/M Transition: ANAPC2, ANAPC4, ANAPC5, ARHI, BCCIP, BIRC5, CCNA1 (cyclin A1), CCNB1 (cyclin B1), CCNG1 (cyclin G1), CCNH, CCNT1, CCNT2, CDC25A, CDC25C, CDC37, CDK5R1, CDK5R2, CDK5RAP1, CDK5RAP3, CDK2, CDK7, CDKN3, CKS1B, CKS2, DDX11, DNMT2, GTF2H1, GTSE1, HERC5, KPNA2, MNAT1, PKMYT1, RGC32, SERTAD1.

M Phase: CCNB2 (cyclin B2), CCNF, CDC2 (CDK1), CDC16, CDC20 (p55cdc), CDC25A, CDC25C, MRE11A, RAD50, RAD51.

Cell Cycle Checkpoint and Cell Cycle Arrest: ATM, ATR, BRCA1, BRCA2, CCNA2 (cyclin A2), CCNE2 (cyclin E2), CCNG2 (cyclin G2), CDC2 (CDK1), CDC25A, CDC34, CDC45L, CDC6, CDK2, CDKN1A (p21), CDKN1B (p27), CDKN1C (p57), CDKN2A (p16), CDKN2B (p15), CDKN2C (p18), CDKN2D (p19), CDKN3, CHEK1 (CHK1), CHEK2 (CHK2 / RAD53), CUL1, CUL2, CUL3, CUL4A, CUL5, GADD45A, HUS1, KNTC1, MAD2L1, MAD2L2, NBS1 (NIBRIN), RAD1, RAD17, RAD9A, RB1, RBBP8, TP53 (p53).

Regulation of the Cell Cycle: ABL1 (C-ABL), ANAPC2, ANAPC4, ANAPC5, ARHI, ATM, ATR, BCCIP, BCL2, BRCA2, CCNA1 (cyclin A1), CCNA2 (cyclin A2), CCNB1 (cyclin B1), CCNB2 (cyclin B2), CCNC (cyclin C), CCND1 (cyclin D1), CCND2 (cyclin D2), CCND3 (cyclin D3), CCNE1 (cyclin E1), CCNE2 (cyclin E2), CCNF (cyclin F), CCNH (cyclin H), CCNT1, CCNT2, CDC16, CDC2 (CDK1), CDC20 (p55cdc), CDC25A, CDC25C, CDC37, CDC45L, CDC6, CDK2, CDK4, CDK5R1, CDK5R2, CDK6, CDK7, CDK8, CDKN1A (p21), CDKN1B (p27), CKS1B, CUL5, DDX11, E2F1, E2F2, E2F3, E2F4, E2F5, E2F6, GADD45A, KNTC1, MKI67 (Ki67), PCNA, PKMYT1, RAD9A, RB1, SKP2, TFDP1 (DP1), TFDP2 (DP2).

Negative Regulation of the Cell Cycle: ATM, BAX, BRCA1, CDC7, CDKN2B (p15), CDKN2D (p19), RBL1 (p107 RB), RBL2 (p130 RB2), TP53 (p53).

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.

GEArray 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.

Oligo GEArray[®] Human Cell Cycle Microarray

Array Layout:

RPS27A 1	ABL1 2	ANAPC2 3	ANAPC4 4	ANAPC5 5	ARHI 6	ATM 7	ATR 8
BAX 9	BCCIP 10	BCL2 11	BIRC5 12	BRCA1 13	BRCA2 14	CCNA1 15	CCNA2 16
CCNB1 17	CCNB2 18	CCNC 19	CCND1 20	CCND2 21	CCND3 22	CCNE1 23	CCNE2 24
CCNF 25	CCNG1 26	CCNG2 27	CCNH 28	CCNT1 29	CCNT2 30	CDC16 31	CDC2 32
CDC20 33	CDC25A 34	CDC25C 35	CDC34 36	CDC37 37	CDC45L 38	CDC6 39	CDC7 40
CDK2 41	CDK4 42	CDK5R1 43	CDK5R2 44	CDK5RAP1 45	CDK5RAP3 46	CDK6 47	CDK7 48
CDK8 49	CDKN1A 50	CDKN1B 51	CDKN1C 52	CDKN2A 53	CDKN2B 54	CDKN2C 55	CDKN2D 56
CDKN3 57	CHEK1 58	CHEK2 59	CKS1B 60	CKS2 61	CUL1 62	CUL2 63	CUL3 64
CUL4A 65	CUL5 66	DDX11 67	DNM2 68	E2F1 69	E2F2 70	E2F3 71	E2F4 72
E2F5 73	E2F6 74	GADD45A 75	GTF2H1 76	GTSE1 77	HERC5 78	HUS1 79	KNTC1 80
KPNA2 81	MAD2L1 82	MAD2L2 83	MCM2 84	MCM3 85	MCM4 86	MCM5 87	MCM6 88
MCM7 89	MKI67 90	MNAT1 91	MRE11A 92	NBS1 93	PCNA 94	PKMYT1 95	RAD1 96
RAD17 97	RAD50 98	RAD51 99	RAD9A 100	RB1 101	RBBP8 102	RBL1 103	RBL2 104
RGC32 105	RPA3 106	SERTAD1 107	SKP2 108	SUMO1 109	TFDP1 110	TFDP2 111	TP53 112
UBE1 113	Blank 114	PUC18 115	Blank 116	Blank 117	AS1R2 118	AS1R1 119	AS1 120
GAPD 121	B2M 122	HSPCB 123	HSPCB 124	ACTB 125	ACTB 126	BAS2C 127	BAS2C 128

Gene Table

Position	UniGene	GenBank	Symbol	Description	Gene Name
1	Hs.546292	NM_002954	RPS27A	Ribosomal protein S27a	CEP80/HUBCEP80
2	Hs.431048	NM_005157	ABL1	V-abl Abelson murine leukemia viral oncogene homolog 1	ABL/C-ABL
3	Hs.533262	NM_013366	ANAPC2	Anaphase promoting complex subunit 2	APC2
4	Hs.152173	NM_013367	ANAPC4	Anaphase promoting complex subunit 4	APC4
5	Hs.7101	NM_016237	ANAPC5	Anaphase promoting complex subunit 5	APC5/PDL-108
6	Hs.194695	NM_004675	ARHI	DIRAS family, GTP-binding RAS-like 3	DIRAS3/MEMBER 1
7	Hs.435561	NM_000051	ATM	Ataxia telangiectasia mutated (includes complementation groups A, C and D)	AT1/ATA
8	Hs.271791	NM_001184	ATR	Ataxia telangiectasia and Rad3 related	FRP1/SCKL
9	Hs.159428	NM_004324	BAX	BCL2-associated X protein	BAX ZETA
10	Hs.370292	NM_016567	BCCIP	BRCA2 and CDKN1A interacting protein	ITOK-1
11	Hs.150749	NM_000633	BCL2	B-cell CLL/lymphoma 2	BCL-2
12	Hs.514527	NM_001168	BIRC5	Baculoviral IAP repeat-containing 5 (survivin)	API4/EPR-1
13	Hs.194143	NM_007294	BRCA1	Breast cancer 1, early onset	BRCA1/IRIS
14	Hs.34012	NM_000059	BRCA2	Breast cancer 2, early onset	FACD/FAD
15	Hs.417050	NM_003914	CCNA1	Cyclin A1	Cyclin A1
16	Hs.85137	NM_001237	CCNA2	Cyclin A2	CCN1/CCNA
17	Hs.23960	NM_031966	CCNB1	Cyclin B1	CCNB
18	Hs.194698	NM_004701	CCNB2	Cyclin B2	HST17299
19	Hs.430646	NM_005190	CCNC	Cyclin C	Cyclin C
20	Hs.523852	NM_053056	CCND1	Cyclin D1 (PRAD1: parathyroid adenomatosis 1)	BCL1/CYCLIN D1
21	Hs.376071	NM_001759	CCND2	Cyclin D2	KIAK0002
22	Hs.534307	NM_001760	CCND3	Cyclin D3	Cyclin D3
23	Hs.244723	NM_001238	CCNE1	Cyclin E1	CCNE
24	Hs.408658	NM_004702	CCNE2	Cyclin E2	CYCE2
25	Hs.1973	NM_001761	CCNF	Cyclin F	FBX1/FBXO1
26	Hs.79101	NM_004060	CCNG1	Cyclin G1	CCNG
27	Hs.13291	NM_004354	CCNG2	Cyclin G2	Cyclin G2
28	Hs.292524	NM_001239	CCNH	Cyclin H	CAK/p34
29	Hs.279906	NM_001240	CCNT1	Cyclin T1	CCNT/CYCT1
30	Hs.292754	NM_001241	CCNT2	Cyclin T2	CCNT2
31	Hs.374127	NM_003903	CDC16	CDC16 cell division cycle 16 homolog (S. cerevisiae)	APC6
32	Hs.334562	NM_001786	CDC2	Cell division cycle 2, G1 to S and G2 to M	CDK1
33	Hs.524947	NM_001255	CDC20	CDC20 cell division cycle 20 homolog (S. cerevisiae)	HOMOLOG/P55CDC
34	Hs.1634	NM_001789	CDC25A	Cell division cycle 25A	CDC25A2
35	Hs.656	NM_001790	CDC25C	Cell division cycle 25C	CDC25
36	Hs.514997	NM_004359	CDC34	Cell division cycle 34	E2-CDC34/UBE2R1
37	Hs.160958	NM_007065	CDC37	CDC37 cell division cycle 37 homolog (S. cerevisiae)	P50
38	Hs.474217	NM_003504	CDC45L	CDC45 cell division cycle 45-like (S. cerevisiae)	CDC45/CDC45L2
39	Hs.405958	NM_001254	CDC6	CDC6 cell division cycle 6 homolog (S. cerevisiae)	CDC18L/HSCDC18
40	Hs.533573	NM_003503	CDC7	CDC7 cell division cycle 7 (S. cerevisiae)	CDC7L1/HSCDC7
41	Hs.19192	NM_001798	CDK2	Cyclin-dependent kinase 2	P33(CDK2)
42	Hs.95577	NM_000075	CDK4	Cyclin-dependent kinase 4	CMM3/PSK-J3
43	Hs.500015	NM_003885	CDK5R1	Cyclin-dependent kinase 5, regulatory subunit 1 (p35)	CDK5P35/CDK5R
44	Hs.158460	NM_003936	CDK5R2	Cyclin-dependent kinase 5, regulatory subunit 2 (p39)	NCK5A1/P39
45	Hs.435952	NM_016408	CDK5RAP1	CDK5 regulatory subunit associated protein 1	C42/CGI-05
46	Hs.20157	NM_176096	CDK5RAP3	CDK5 regulatory subunit associated protein 3	C53/HSF-27
47	Hs.119882	NM_001259	CDK6	Cyclin-dependent kinase 6	PLSTIRE
48	Hs.184298	NM_001799	CDK7	Cyclin-dependent kinase 7 (MO15 homolog, Xenopus laevis, cdk-activating kinase)	CAK1/CDKN7

Product Specification Sheet

Position	UniGene	GenBank	Symbol	Description	Gene Name
49	Hs.382306	NM_001260	CDK8	Cyclin-dependent kinase 8	K35
50	Hs.370771	NM_000389	CDKN1A	Cyclin-dependent kinase inhibitor 1A (p21, Cip1)	CAP20/CDKN1
51	Hs.238990	NM_004064	CDKN1B	Cyclin-dependent kinase inhibitor 1B (p27, Kip1)	CDKN4/KIP1
52	Hs.106070	NM_000076	CDKN1C	Cyclin-dependent kinase inhibitor 1C (p57, Kip2)	BWCR/BWS
53	Hs.512599	NM_058195	CDKN2A	Cyclin-dependent kinase inhibitor 2A (melanoma, p16, inhibits CDK4)	ARF/CDK4
54	Hs.72901	NM_004936	CDKN2B	Cyclin-dependent kinase inhibitor 2B (p15, inhibits CDK4)	INK4B/MTS2
55	Hs.525324	NM_078626	CDKN2C	Cyclin-dependent kinase inhibitor 2C (p18, inhibits CDK4)	INK4C/P18
56	Hs.435051	NM_001800	CDKN2D	Cyclin-dependent kinase inhibitor 2D (p19, inhibits CDK4)	INK4D/P19
57	Hs.84113	NM_005192	CDKN3	Cyclin-dependent kinase inhibitor 3 (CDK2-associated dual specificity phosphatase)	CD1/CIP2
58	Hs.24529	NM_001274	CHEK1	CHK1 checkpoint homolog (S. pombe)	CHK1
59	Hs.291363	NM_007194	CHEK2	CHK2 checkpoint homolog (S. pombe)	CDS1/CHK2
60	Hs.374378	NM_001826	CKS1B	CDC28 protein kinase regulatory subunit 1B	CKS1/CKSHS1
61	Hs.83758	NM_001827	CKS2	CDC28 protein kinase regulatory subunit 2	CKSHS2
62	Hs.146806	NM_003592	CUL1	Cullin 1	Cul1
63	Hs.82919	NM_003591	CUL2	Cullin 2	Cullin-Cul2
64	Hs.372286	NM_003590	CUL3	Cullin 3	Cullin-Cul3
65	Hs.339735	NM_003589	CUL4A	Cullin 4A	Cullin-Cul4A
66	Hs.440320	NM_003478	CUL5	Cullin 5	VACM-1/VACM1
67	Hs.443960	NM_004399	DDX11	DEAD/H (Asp-Glu-Ala-Asp/His) box polypeptide 11 (CHL1-like helicase homolog, S. cerevisiae)	CHL1/CHLR1
68	Hs.211463	NM_004945	DNM2	Dynamitin 2	DYN2/DYNII
69	Hs.96055	NM_005225	E2F1	E2F transcription factor 1	E2F-1/RBBP3
70	Hs.194333	NM_004091	E2F2	E2F transcription factor 2	E2F-2
71	Hs.269408	NM_001949	E2F3	E2F transcription factor 3	E2F-3
72	Hs.108371	NM_001950	E2F4	E2F transcription factor 4, p107/p130-binding	E2F-4
73	Hs.445758	NM_001951	E2F5	E2F transcription factor 5, p130-binding	E2F-5
74	Hs.135465	NM_001952	E2F6	E2F transcription factor 6	E2F-6
75	Hs.80409	NM_001924	GADD45A	Growth arrest and DNA-damage-inducible, alpha	DDIT1/GADD45
76	Hs.523510	NM_005316	GTF2H1	General transcription factor IIH, polypeptide 1, 62kDa	BTF2/TFIIH
77	Hs.386189	NM_016426	GTSE1	G-2 and S-phase expressed 1	B99
78	Hs.26663	NM_016323	HERC5	Hect domain and RLD 5	CEB1
79	Hs.152983	NM_004507	HUS1	HUS1 checkpoint homolog (S. pombe)	Hus1
80	Hs.300559	NM_014708	KNTC1	Kinetochore associated 1	ROD
81	Hs.252712	NM_002266	KPNA2	Karyopherin alpha 2 (RAG cohort 1, importin alpha 1)	IPOA1/QIP2
82	Hs.533185	NM_002358	MAD2L1	MAD2 mitotic arrest deficient-like 1 (yeast)	HSMAD2/MAD2
83	Hs.19400	NM_006341	MAD2L2	MAD2 mitotic arrest deficient-like 2 (yeast)	MAD2B/REV7
84	Hs.477481	NM_004526	MCM2	MCM2 minichromosome maintenance deficient 2, mitotin (S. cerevisiae)	BM28/CENL1
85	Hs.179565	NM_002388	MCM3	MCM3 minichromosome maintenance deficient 3 (S. cerevisiae)	HCC5/P1-MCM3
86	Hs.460184	NM_005914	MCM4	MCM4 minichromosome maintenance deficient 4 (S. cerevisiae)	CDC21/CDC54
87	Hs.517582	NM_006739	MCM5	MCM5 minichromosome maintenance deficient 5, cell division cycle 46 (S. cerevisiae)	CDC46/P1-CDC46
88	Hs.444118	NM_005915	MCM6	MCM6 minichromosome maintenance deficient 6 (MIS5 homolog, S. pombe) (S. cerevisiae)	MCG40308/MIS5
89	Hs.438720	NM_005916	MCM7	MCM7 minichromosome maintenance deficient 7 (S. cerevisiae)	CDABP0042/CDC47
90	Hs.80976	NM_002417	MKI67	Antigen identified by monoclonal antibody Ki-67	KI-67/KiA
91	Hs.509523	NM_002431	MNAT1	Menage a trois 1 (CAK assembly factor)	MAT1/RNF66
92	Hs.192649	NM_005590	MRE11A	MRE11 meiotic recombination 11 homolog A (S. cerevisiae)	ATLD/HNGS1
93	Hs.492208	NM_002485	NBS1	Nijmegen breakage syndrome 1 (nibrin)	AT-V1/AT-V2
94	Hs.147433	NM_182649	PCNA	Proliferating cell nuclear antigen	MGC8367
95	Hs.77783	NM_182687	PKMYT1	Protein kinase, membrane associated tyrosine/threonine 1	MYT1
96	Hs.531879	NM_002853	RAD1	RAD1 homolog (S. pombe)	HRAD1
97	Hs.16184	NM_002873	RAD17	RAD17 homolog (S. pombe)	CCYC/HRAD17
98	Hs.242635	NM_005732	RAD50	RAD50 homolog (S. cerevisiae)	HRAD50/RAD50-2
99	Hs.446554	NM_002875	RAD51	RAD51 homolog (RecA homolog, E. coli) (S. cerevisiae)	HRAD51/HSRAD51
100	Hs.240457	NM_004584	RAD9A	RAD9 homolog A (S. pombe)	RAD9
101	Hs.408528	NM_000321	RB1	Retinoblastoma 1 (including osteosarcoma)	OSRC/RB
102	Hs.546282	NM_002894	RBBP8	Retinoblastoma binding protein 8	CTIP/RIM
103	Hs.207745	NM_002895	RBL1	Retinoblastoma-like 1 (p107)	CP107/P107
104	Hs.513609	NM_005611	RBL2	Retinoblastoma-like 2 (p130)	P130/RB2
105	Hs.507866	NM_014059	RGC32	Response gene to complement 32	LOC387922
106	Hs.487540	NM_002947	RPA3	Replication protein A3, 14kDa	REPA3
107	Hs.269898	NM_013376	SERTAD1	SERTA domain containing 1	SEI1/TRIP-BR1
108	Hs.23348	NM_005983	SKP2	S-phase kinase-associated protein 2 (p45)	FBL1/FBXL1
109	Hs.81424	NM_003352	SUMO1	SMT3 suppressor of mif two 3 homolog 1 (yeast)	GMP1/PC1
110	Hs.79353	NM_007111	TFDP1	Transcription factor Dp-1	DP-1/DP1
111	Hs.379018	NM_006286	TFDP2	Transcription factor Dp-2 (E2F dimerization partner 2)	DP-2/DP2
112	Hs.408312	NM_000546	TP53	Tumor protein p53 (Li-Fraumeni syndrome)	CYS51STOP/P53
113	Hs.533273	NM_003334	UBE1	Ubiquitin-activating enzyme E1 (A1S9T and BN75 temperature sensitivity)	A1S9/A1ST
114	Blank	Blank	Blank	Blank	
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	Hs.544577	NM_002046	GAPDH	Glyceraldehyde-3-phosphate dehydrogenase	G3PD/GAPD
122	Hs.534255	NM_004048	B2M	Beta-2-microglobulin	B2M
123	Hs.509736	NM_007355	HSPCB	Heat shock 90kDa protein 1, beta	BETA/D6S182
124	Hs.509736	NM_007355	HSPCB	Heat shock 90kDa protein 1, beta	BETA/D6S182
125	Hs.520640	NM_001101	ACTB	Actin, beta	b-Actin
126	Hs.520640	NM_001101	ACTB	Actin, beta	b-Actin
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