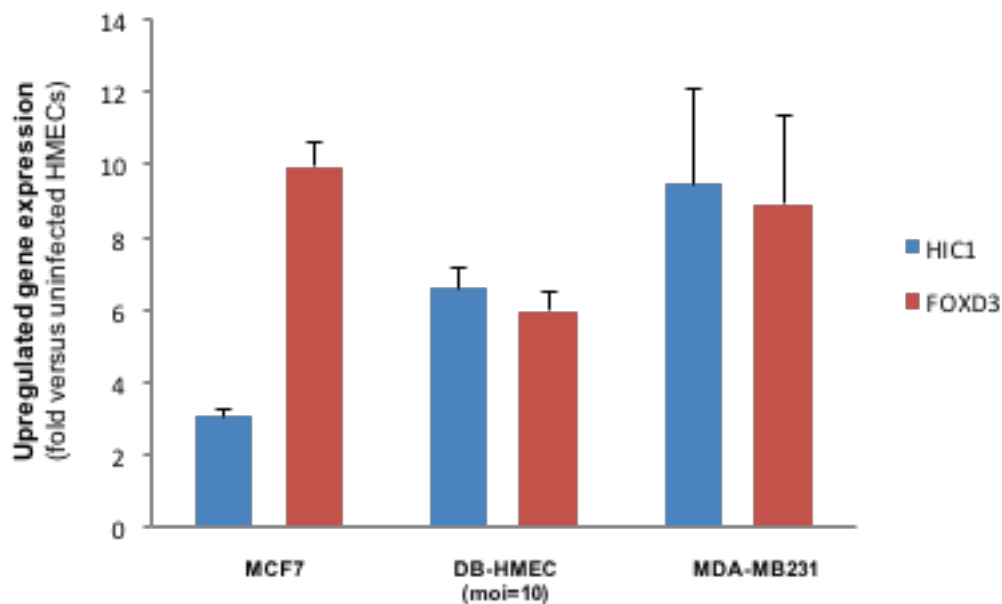


The transcriptome of human mammary epithelial cells infected with the HCMV-DB strain displays oncogenic traits.

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Suppl. Fig. 1 Upregulation of the tumor suppressor gene hypermethylated in cancer 1 (HIC1) and forkhead box D3 (FOXD3) in HMECs infected with HCMV-DB.



Suppl. Table 1. Degree of variability between the ORF of the 11 HCMV strains studied.

Conserved genes	Variable genes	Highly Variable
IRS1	RL10	RL1
RL11	RL8A	RL12
RNA1.2	S30	RL13
RNA2.7	UL10	RL5A
RNA4.9	UL11	RL6
RNA5.0	UL112	RL9
TRS1	UL115	RL9A
UL13	UL121	UL1
UL100	UL124	UL105
UL102	UL130	UL119
UL103	UL132	UL120
UL104	UL135	UL128
UL111A	UL138	UL133
UL114	UL139	UL139
UL116	UL14	UL144
UL117	UL140	UL146
UL122	UL142	UL147
UL123	UL148	UL147A
UL131A	UL148B	UL148A
UL136	UL150A	UL148D
UL141	UL17	UL150
UL145	UL19	UL2
UL148C	UL20	UL33
UL15A	UL22A	UL4
UL16	UL27	UL40
UL18	UL30	UL47
UL21A	UL40	UL6
UL23	UL41A	UL61
UL24	UL45	UL73
UL25	UL49	UL74A
UL26	UL55	UL74A
UL29	UL7	UL75
UL31	UL76	UL9
UL32	UL78	US1
UL34	UL8	US10
UL35	UL80	US27
UL36	UL87	US33A
UL37	UL93	US7
UL38	UL99	
UL42	US23	
UL43	US26	
UL44	US28	
UL46	US33A	
UL47	US6	
UL48	US9	
UL48A		
UL5		
UL50		
UL51		
UL52		
UL53		
UL54		
UL56		
UL57		
UL69		
UL70		
UL71		
UL72		
UL77		
UL79		
UL80.5		
UL82		
UL83		
UL84		
UL85		
UL86		
UL88		
UL89		
UL91		
UL92		
UL94		
UL95		
UL96		
UL97		
UL98		
US11		
US12		
US13		
US14		
US15		
US16		
US17		
US18		
US19		
US20		
US21		
US21		
US22		
US24		
US29		
US3		
US31		
US32		
US34		
US8		

Suppl. Table 2. Cellular gene expression in HMECs infected with HCMV-DB compared to uninfected HMECs using the human breast cancer genes RT² profiler PCR assays (PAHS-131ZA).

Symbol	Description	Fold Up- or Down- Regulation/ HMEC UI			
		MCF-7	HMEC DB 1MOI	HMEC DB 10 MOI	MDAMB-231
CCNA1	Cyclin A1	-1.68	3.62	6.73	7.03
CCNA2	Cyclin A2	5.44	3.83	10.49	16.27
CCNE1	Cyclin E1	-2.11	4.05	8.52	3.08
CDH1	Cadherin 1. type 1. E-cadherin (epithelial)	ND	6.33	7.54	ND
CLDN7	Claudin 7	ND	9.43	26.93	ND
CTNNB1	Catenin (cadherin-associated protein). beta 1. 88kDa	ND	2.94	6.97	ND
EGF	Epidermal growth factor	ND	1.28	6.08	ND
ESR1	Estrogen receptor 1	875.39	2.34	24.26	5.40
ESR2	Estrogen receptor 2 (ER beta)	16.15	-2.46	47.54	41.18
GATA3	GATA binding protein 3	154.75	4.62	5.21	1.72
GLI1	Glioma-associated oncogene	ND	-3,71	ND	ND
HER2	Human epidermal growth factor receptor 2	5.45	4.30	32.84	10.06
IGF1R	Insulin Like Growth Factor 1 Receptor	ND	-7,32	ND	ND
ITGA6	Integrin Subunit Alpha 6	ND	2.63	11.48	ND
KRT18	Keratin 18	59.46	0.01	5.86	5.75
KRT19	Keratin 19	34249.59	2.21	8.88	4717.98
MAPK3	Mitogen-Activated Protein Kinase 3	ND	-10,36	ND	ND
MAPK8	Mitogen-Activated Protein Kinase 8	ND	-5,59	ND	ND
MKI67	Antigen identified by monoclonal antibody Ki-67	15.93	4.10	10.86	14.46
PGR	Progesterone receptor	1482.48	0.09	57.32	8.02
SERPINE1	Serpin Family E Member 1	ND	2.41	26.37	ND
S100A4	S100 Calcium Binding Protein A4	ND	2.52	1.41	ND
TFF1	Trefoil factor 1	8294934.92	3.67	150.22	2126.04
THBS1	Thrombospondin 1	ND	3.15	7.07	ND
TOPO2A	Topoisomerase (DNA) II alpha 170kDa	16.04	6.09	36.02	22.85

Suppl. Table 3. Cellular gene expression in HMECs infected with HCMV-DB compared to uninfected HMECs using the oncogenes/tumor suppressor genes RT² profiler PCR assays (PAHS-502Z).

Symbol	Description	Fold Up- or Down- Regulation/ HMEC UI			
		MCF-7	HMEC DB 1MOI	HMEC DB 10 MOI	MDAMB-231
ABL1	C-abl oncogene 1. receptor tyrosine kinase	4.17	4.73	4.24	2.07
AKT1	V-akt murine thymoma viral oncogene homolog 1	12.13	4.00	1.43	2.05
ATM	Ataxia telangiectasia mutated	2.59	4.03	5.37	5.19
BCL-2	B-cell CLL/lymphoma 2	6.04	2.51	8.52	65.52
CASP8	Caspase 8. apoptosis-related cysteine peptidase	4.29	-3.36	4.87	1.42
CCND1	Cyclin D1	4.12	5.76	9.01	15.18
CDK4	Cyclin-dependent kinase-4	21.87	3.73	2.98	3.04
CDKN1A	Cyclin-dependent kinase inhibitor 1A (p21. Cip1)	3.33	3.12	4.39	-6.53
CDKN2A	Cyclin-dependent kinase inhibitor 2A (melanoma. p16. inhibits CDK4)	-513.42	5.79	4.55	-641.81
CDKN2B	Cyclin-dependent kinase inhibitor 2B (p15. inhibits CDK4)	4.15	3.21	5.37	-1046.53
CDKN3	Cyclin-dependent kinase inhibitor 3	24.35	7.58	4.04	2.78
CST6	Cystatin-M	ND	-3.61	ND	ND
CTSD	Cathepsin D	ND	-1.85	ND	ND
ETS1	V-ets erythroblastosis virus E26 oncogene homolog 1 (avian)	-730.50	8.95	5.96	3.37
FHIT	Fragile histidine triad gene	1.68	2.25	3.96	0.16
FOS	V-fos FBJ murine osteosarcoma viral oncogene homolog	-1.56	14.04	4.94	-4.96
FOXD3	Forkhead box D3	9.92	ND	5.96	8.91
HIC1	Hypermethylated in cancer 1	3.08	ND	6.61	9.48
HRAS	V-Ha-ras Harvey rat sarcoma viral oncogene homolog	2.35	4.23	2.74	-2.08
ID1	Inhibitor of DNA binding 1, dominant negative helix-loop-helix protein	191.84	-5.24	3.76	2.30

		Fold Up- or Down- Regulation/ HMEC UI			
Symbol	Description	MCF-7	HMEC DB 1MOI	HMEC DB 10 MOI	MDAMB-231
IL6	Interleukin 6 (interferon. beta 2)	-4.43	-3.89	16.92	331.75
IL6R	Interleukin 6 receptor	2.93	3.65	9.19	-6.31
IL6ST	Interleukin 6 signal transducer (gp130. oncostatin M receptor)	5.40	4.91	22.80	32.99
JAK2	Janus kinase 2	14.04	4.53	7.34	2.82
JUN	Jun oncogene	6.50	5.10	1.99	3.80
KITLG	KIT ligand	3.27	9.13	2.98	2.40
KRAS	V-Ki-ras2 Kirsten rat sarcoma viral oncogene homolog	5.39	8.12	2.17	1.68
MCL1	Myeloid cell leukemia sequence 1 (BCL2- related)	5.43	4.50	2.86	-1458.21
MET	Met proto-oncogene (hepatocyte growth factor receptor)	-6.60	5.74	3.06	1.48
MLH1	MutL homolog 1. colon cancer. nonpolyposis type 2 (E. coli)	9.01	3.98	3.72	3.10
MMP9	Matrix metallopeptidase 9	ND	7,91	ND	ND
MOS	V-mos Moloney murine sarcoma viral oncogene homolog	ND	-2.60	ND	ND
MYB	V-myb myeloblastosis viral oncogene homolog (avian)	1060.90	2.19	2.78	13.31
MYC	V-myc myelocytomatosis viral oncogene homolog (avian)	1.59	9.86	3.72	1.45
NFKB1	Nuclear factor of kappa light polypeptide gene enhancer in B-cells 1	4.47	3.63	1.52	0.01
NFKBIA	Nuclear factor of kappa light polypeptide gene enhancer in B-cells 1	6.11	2.81	1.53	1.28
NRAS	Neuroblastoma RAS viral (v-ras) oncogene homolog	35.53	8.52	1.96	3.67
PIK3C2A	Phosphoinositide-3- kinase, class 2, alpha polypeptide	5.32	7.07	2.32	1.88

		Fold Up- or Down- Regulation/ HMEC UI			
Symbol	Description	MCF-7	HuMEC DB 1MOI	HuMEC DB 10 MOI	MDAMB-231
PIK3CA	Phosphoinositide-3-kinase, catalytic, alpha polypeptide	5.28	5.82	2.84	6.30
PML	Promyelocytic leukemia	2.45	10.13	1.78	2.84
PRKCA	Protein kinase C. alpha	8.52	6.24	2.29	35.88
RAF1	V-raf-1 murine leukemia viral oncogene homolog 1	13.56	5.32	2.34	2.29
RARA	Retinoic acid receptor. alpha	4.96	7.32	-1.20	8.72
RB1	Retinoblastoma 1	3.72	4.16	1.52	6.75
REL	V-rel reticuloendotheliosis viral oncogene homolog (avian)	3.97	3.76	-1.14	0.23
RET	Ret proto-oncogene	515.94	6.59	3.59	1.81
ROS1	C-ros oncogene 1 . receptor tyrosine kinase	-4.67	6.07	4.01	-5.73
RUNX1	Runt-related transcription factor 1	3.37	3.92	1.37	2.94
RUNX3	Runt-related transcription factor 3	-1.23	2.83	5.96	2.82
SLIT2	Slit homolog 2 (Drosophila)	-71.36	-16.68	-90.57	-1304.20
SMAD4	SMAD family member 4	2.14	3.39	1.10	4.10
STAT3	Signal transducer and activator of transcription 3 (acute-phase response factor)	-1.30	1.27	1.50	-0.03
STK11	Serine/threonine kinase 11	2.45	0.79	0.65	-1.61
TGFB1	Transforming growth factor. beta 1	-2.55	2.55	-1.23	1.95
TP53	Tumor protein p53	4.00	5.28	-1.20	7.49
TP73	Tumor protein p73	14.63	1.87	3.42	33.71
TSC1	Tuberous sclerosis 1	4.00	2.10	1.16	3.00
VHL	Von Hippel-Lindau tumor suppressor	9.52	3.58	1.07	3.30

Suppl. Table 4. Cellular gene expression in HMECs infected with HCMV-DB compared to uninfected HMECs using the Human Epigenetic Chromatin Modification Enzymes RT² Profiler PCR Array (PAHS-085A).

Symbol	Description	Fold Up- or Down- Regulation HMEC DB / HMEC UI
ASH1L	ASH1 Like Histone Lysine Methyltransferas	-155.00
ATF2	Activating Transcription Factor 2	-9.10
AURKA	Aurora Kinase A	-8.20
AURKB	Aurora Kinase B	-3.96
AURKC	Aurora Kinase C	-2.15
CIITA	Class II Major Histocompatibility Complex Transactivator	-3.91
CSRP2BP	CSRP2 binding protein	-6.26
DNMT3A	DNA Methyltransferase 3 Alpha	-2.94
DNMT3B	DNA Methyltransferase 3 Beta	-1.42
HDAC10	Histone Deacetylase 10	-2.05
HDAC2	Histone Deacetylase 2	-19.11
HDAC3	Histone Deacetylase 3	7.43
HDAC4	Histone Deacetylase 4	-19.64
HDAC5	Histone Deacetylase 5	-3.57
HDAC6	Histone Deacetylase 6	-2.47
HDAC9	Histone Deacetylase 9	-2.03
KAT2A	Lysine acetyltransferase 2A	-12.26
KAT6B	Lysine acetyltransferase 6B	-17.34
KDM1A	Lysine demethylase 1A	-16.75
KDM5C	Lysine demethylase 5C	-3.40
KDM4C	Lysine demethylase 4C	-15.23
KDM6B	Lysine demethylase 6B	-12.43
MLL3 (KMT2C)	Lysine methyltransferase 2C	-3.54
MLL5 (KMT2E)	Lysine methyltransferase 2E	-4.98
MYSM1	myb-like. SWIRM and MPN domains 1	-2.69
NCOA1	Nuclear receptor coactivator 1	-3.52
NEK6	NIMA related kinase 6	-11.76
NSD1	Nuclear receptor binding SET domain protein 1	-2.82

Symbol	Description	Fold Up- or Down- Regulation HMEC DB / HMEC UI
	WHSC1	Wolf-Hirschhorn syndrome candidate 1
PRMT1	Protein arginine methyltransferase 1	-2.63
PRMT2	Protein arginine methyltransferase 2	-2.63
PRMT3	Protein arginine methyltransferase 3	2.68
PRMT5	Protein arginine methyltransferase 5	2.76
PRMT6	Protein arginine methyltransferase 6	2.84
PRMT8	Protein arginine methyltransferase 8	-22.41
RNF2	Ring finger protein 2	-551.09
RNF20	Ring finger protein 20	-84.81
RPS6KA3	Ribosomal protein S6 kinase A3	-554.92
SETD1A	SET domain containing 1A	-7.39
SETDB1	SET domain bifurcated 1	-18.58
SETDB2	SET domain bifurcated 2	-76.96
SETD2	SET domain containing 2	-3.85
SETD3	SET domain containing 3	-3.54
SETD4	SET domain containing 4	2.22
SETD5	SET domain containing 5	-8.73
SETD6	SET domain containing 6	-7.98
SETD7	SET domain containing 7	-51.84
SETD8	SET domain containing 8	-4056.84
SMYD3	SET and MYND domain containing 3	-2.45
SUV39H1	Suppressor of variegation 3-9 homolog 1	-5.72
SUV420H1	Suppressor of variegation 4-20 homolog 1	-26.10
UBE2A	Ubiquitin conjugating enzyme E2 A	-11.92
UBE2B	Ubiquitin conjugating enzyme E2 B	-3.99
USP21	Ubiquitin specific peptidase 21	-94.10
USP22	Ubiquitin specific peptidase 22	-31.69
WHSC1	Wolf-Hirschhorn syndrome candidate 1	-32.13

Suppl. Table 5. Cellular gene families classification of the Human Epigenetic Chromatin Modification Enzymes RT² Profiler PCR Array (PAHS-085A).

Family	Symbol	Description
Histone acetyltransferase genes	ATF2	Activating Transcription Factor 2
	CIITA	Class II Major Histocompatibility Complex Transactivator
	CSRP2BP	CSRP2 binding protein
	KAT2A	Lysine acetyltransferase 2A
	KAT6B	Lysine acetyltransferase 6B
	NCOA1	Nuclear receptor coactivator 1
Histone kinase genes	AURKA	Aurora Kinase A
	AURKB	Aurora Kinase B
	AURKC	Aurora Kinase C
	NEK6	NIMA related kinase 6
	RPS6KA3	Ribosomal protein S6 kinase A3
Genes involved in histone ubiquitination	MYSM1	Myb Like SWIRM and MPN domains 1
	RNF2	Ring finger protein 2
	RNF20	Ring finger protein 20
	UBE2A	Ubiquitin conjugating enzyme E2 A
	UBE2B	Ubiquitin conjugating enzyme E2 B
	USP21	Ubiquitin specific peptidase 21
	USP22	Ubiquitin specific peptidase 22
DNA/histone demethylase genes	KDM1A	Lysine demethylase 1A
	KDM5C	Lysine demethylase 5C
	KDM4C	Lysine demethylase 4C
	KDM6B	Lysine demethylase 6B

Family	Symbol	Description
Histone deacetylase genes	HDAC10	Histone Deacetylase 10
	HDAC2	Histone Deacetylase 2
	HDAC3	Histone Deacetylase 3
	HDAC4	Histone Deacetylase 4
	HDAC5	Histone Deacetylase 5
	HDAC6	Histone Deacetylase 6
	HDAC9	Histone Deacetylase 9