Supplementary Information

Highly conserved interaction profiles between clinically relevant mutants of the cytomegalovirus CDK-like kinase pUL97 and human cyclins

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Table S1. List of 473 ORF-UL97 GenBank accession numbers.

YP_081544.1	AEF33987.1	AKI22520.1	QZX46450.1	APG57625.1	AKI17170.1	AJZ68912.1
AAS48981.1	AEF33986.1	AKI22352.1	QZX46283.1	APG57456.1	AKI16669.1	AJZ68911.1
ASY06521.1	AEF33985.1	AKI22187.1	QZX46115.1	APG57286.1	AKI16506.1	AJZ68910.1
ASY06353.1	AEF33984.1	AKI21686.1	QZX45948.1	AGT36515.1	AKI16339.1	AJZ68909.1
ASY06184.1	AEF33979.1	AKI21520.1	QUP52178.1	ACS32399.1	AKI16170.1	AJZ68908.1
ASY06016.1	AEF33975.1	AKI21021.1	QTT59577.1	APA46333.1	AKI16004.1	AJZ68907.1
AAV49340.1	AEF33973.1	AKI20853.1	QTT59409.1	APA45708.1	AKI15838.1	AJZ68906.1
AAV49339.1	AEF33968.1	AKI20014.1	QTT59241.1	APA45101.1	AKI15505.1	BAF64756.1
AAV49338.1	AEF33956.1	AKI19514.1	QTT59075.1	AND82017.1	AKI15337.1	CAC42715.1
AAV49337.1	ABV04334.1	AKI18675.1	QTT58907.1	AND81688.1	AKI15170.1	ALT14842.1
AAV49336.1	ABV04333.1	AKI18508.1	QTT58739.1	AND81523.1	AKI15002.1	ALT14677.1
AAV49335.1	AHV84044.1	AKI18339.1	QTT58571.1	AKI26591.1	AKI14330.1	ALK03053.1
AAV49334.1	YP_081544.1	AKI17002.1	QTF98549.1	AKI26422.1	AKI14162.1	AHJ85175.1
AAV49332.1	AVT50513.1	AKI16837.1	QTF98383.1	AKI26085.1	AKI13996.1	AHJ84668.1
AAV49329.1	AVT50344.1	AKI15671.1	QPZ45359.1	AKI25917.1	AKI13830.1	AHJ82480.1
AAV49328.1	AQN73919.1	AKI14834.1	QPZ45196.1	AKI25749.1	AKI13494.1	AHJ86183.1
AAV49327.1	AQN73413.1	AKI14667.1	QPZ45031.1	AKI25581.1	AKI13325.1	AKI23355.1
AAV49326.1	AQN71730.1	AKI14499.1	QPZ44867.1	AKI25412.1	AKI13157.1	AKI22855.1
AAV49325.1	AQN69707.1	AKI13662.1	QPZ44704.1	AKI25242.1	AKI12991.1	AEF33957.1
QNT12642.1	AMJ54958.1	AKI12659.1	QPI35515.1	AKI24397.1	AKI12823.1	AEF33955.1
QGH81923.1	AMJ54625.1	AKI12326.1	QPI35345.1	AKI24227.1	AKI12492.1	AEF33954.1
QHB20536.1	AMJ53955.1	AKI11329.1	QPI35176.1	AKI23890.1	AKI12160.1	AEF33953.1
ABV71619.1	AMJ53456.1	AKI10996.1	QPI35006.1	AMD82420.1	AKI11992.1	AAA16790.1
APA46116.1	AMJ52789.1	AKI10829.1	BCM78255.1	AMO64771.1	AKI11825.1	UBQ34163.1
AAV49333.1	AIC80516.1	AKI09486.1	QIA46247.1	AMO64436.1	AKI11661.1	QZX46957.1
AAV49331.1	AIC80348.1	AKI09150.1	QIA46078.1	AHJ83825.1	AKI11497.1	QZX46789.1
AAV49330.1	ACZ72839.1	AKI08982.1	QIA45911.1	AHJ83658.1	AKI11162.1	QZX46620.1
AAV49324.1	APB97551.1	AKI08814.1	QIA45741.1	AHJ83491.1	AKI10661.1	AMJ54123.1
AAV49323.1	APB97382.1	AKI07810.1	QIA45572.1	AHJ83153.1	AKI10494.1	AMJ53789.1
P16788.1	APA45350.1	AJZ68925.1	QIA45403.1	AHJ82984.1	AKI10327.1	AMJ53624.1
Q6SW46.1	AJY57929.1	AJZ68924.1	QIA45234.1	AHJ82815.1	AKI10160.1	AMJ53289.1
Q68101.1	AJY57763.1	AJZ68922.1	QIA45066.1	AFR56417.1	AKI09991.1	AMJ53122.1
AAL10779.1	AJY57596.1	AJZ68921.1	QIA44896.1	AFR56250.1	AKI09822.1	AMJ52956.1
AAL10777.1	AJY57429.1	AJZ68918.1	QIA44728.1	AFR55749.1	AKI09655.1	AMJ52623.1
AAL10775.1	AJY57262.1	AJZ68917.1	QBF76518.1	AFR55580.1	AKI09319.1	AIC80180.1
AAL10772.1	AJY57095.1	AJZ68916.1	AZV24374.1	AFR55415.1	AKI08645.1	APG57963.1
AAL10771.1	AJY56928.1	AII80189.1	AZV24204.1	AFR55246.1	AKI08478.1	AKI19177.1
AAL10767.1	AJY56761.1	AII80022.1	AZV24034.1	AFR55078.1	AKI08312.1	AKI19010.1
AAL10766.1	AJY56594.1	AII79863.1	QBK84323.1	AFR54914.1	AKI08145.1	AKI18843.1
AAL10764.1	AJY56427.1	AII79698.1	ARX80476.1	AFR54747.1	AKI07978.1	AKI18172.1
AAL10790.1	AJY56260.1	AII79530.1	ARX80308.1	AFR54587.1	AKI07642.1	AKI18006.1
AAL10789.1	AJY56093.1	AHB19899.1	AQN73750.1	AHJ86015.1	AHB20064.1	AKI17839.1

AAL10788.1	AJY55926.1	AGL96685.1	AQN73581.1	AHJ85848.1	AHB19733.1	AKI17673.1
AAL10787.1	AJY55759.1	AAR31648.1	AQN73245.1	AHJ85681.1	AHB19566.1	AKI17506.1
AAL10786.1	AJY55592.1	ACT81767.1	AQN73077.1	AHJ85513.1	AHB19398.1	AKI17339.1
AAL10785.1	AJY55425.1	ACS93428.1	AQN72907.1	AHJ85344.1	AGT36386.1	ACF74517.1
AAL10784.1	AJY55258.1	ACS92186.1	AQN72738.1	AHJ85005.1	AGQ47315.1	AZB79970.1
AAL10783.1	AJY55091.1	BAJ06835.1	AQN72570.1	AHJ84837.1	ACZ80337.1	ADV04413.1
AAL10782.1	AJY54924.1	AEF33983.1	AQN72401.1	AHJ84499.1	ACZ80172.1	ABA26301.1
AAL10781.1	AJY54757.1	AEF33982.1	AQN72233.1	AHJ84331.1	ACZ80007.1	ABA26313.1
AAL10780.1	ADD39142.1	AEF33981.1	AQN72064.1	AHJ84163.1	ACZ79843.1	QHX40593.1
AAL10778.1	AND81852.1	AEF33980.1	AQN71897.1	AHJ82143.1	ACU83746.1	QHX40112.1
AAL10776.1	AKI24903.1	AEF33978.1	AQN71560.1	AHJ81975.1	ACT81932.1	CAA35333.1
AAL10774.1	AMO64939.1	AEF33977.1	AQN71391.1	ALN67084.1	ACS92021.1	AKI24565.1
AAL10773.1	AMO64604.1	AEF33976.1	AQN71222.1	ALL26239.1	ACM48074.1	AKI24058.1
AAL10770.1	AHJ83995.1	AEF33974.1	AQN71053.1	AKI23522.1	ACL51165.1	AKI23722.1
AAL10769.1	AHJ83322.1	AEF33972.1	AQN70884.1	AKI23190.1	DAA00194.1	AKI19847.1
AAL10768.1	AHJ82649.1	AEF33971.1	AQN70715.1	AKI23023.1	AAA16789.1	AKI19679.1
AAL10765.1	AFR56083.1	AEF33970.1	AQN70546.1	AKI22687.1	APG57795.1	AKI19346.1
AAL10763.1	AFR55915.1	AEF33969.1	AQN70380.1	AKI22021.1	APA46260.1	AMJ54790.1
AAV85476.1	ADE88088.1	AEF33967.1	AQN70213.1	AKI21853.1	APA45838.1	AMJ54457.1
ALK03055.1	ALT16318.1	AEF33966.1	AQN70043.1	AKI21356.1	APA45592.1	AMJ54290.1
ALK03054.1	ALT16153.1	AEF33965.1	AQN69874.1	AKI21188.1	APA45474.1	AEF33960.1
ALK03052.1	ALT15997.1	AEF33964.1	AQN69539.1	AKI20685.1	APA45223.1	AEF33959.1
AJZ68923.1	ALT15832.1	AEF33963.1	AQN69370.1	AKI20517.1	AKI26254.1	AEF33958.1
AJZ68920.1	ALT15667.1	AEF33962.1	ATP76347.1	AKI20350.1	AKI25072.1	ALT15172.1
AJZ68919.1	ALT15502.1	AEF33961.1	AMJ55123.1	AKI20182.1	AKI24734.1	ALT15007.1
AJZ68915.1	ALT15337.1	AJZ68913.1	AJZ68914.1			

Table S2. Oligonucleotide primers used for BACmid recombinations.

H411Y-for	CACGGCCACGGGCTGCTGTCTGCTGCACAACGTCACGGTATATCGACGTTTCCACACAGACATTAGG GATAACAGGGTAATCGATTT
H411Y-rev	TCCACTGGTCGTGATGAAACATGTCTGTGTGGAAACGTCGATATACCGTGACGTTGTGCAGCAGCCA GTGTTACAACCAATTAACC
T409M-for	TCTGCTCACGGCCACGGGCTGCTGTCTGCTGCACAACGTCATGGTACATCGACGTTTCCACACTAGG GATAACAGGGTAATCGATTT
T409M-rev	GGTCGTGATGAAACATGTCTGTGTGGAAACGTCGATGTACCGTGACGTTGTGCAGCAGACAGCGCCA GTGTTACAACCAATTAACC
F342S-for	GGACATGAGCGACGAGAGCTACCGCCTGGGCCAGGGCTCCTCCGGCGAGGTCTGGCCGCTCGATAGG GATAACAGGGTAATCGATTT
F342S-rev	CCTTGACCACGCGATAGCGATCGAGCGGCCAGACCTCGCCGGAGGAGCCCTGGCCCAGGCGGTGCCA GTGTTACAACCAATTAACC
L595S-for	GGCGTTGCTCTTTAAGCACGCCGGCGCGGCCTGCCGCGCGTCGGAGAACGGCAAGCTCACGCATAGG GATAACAGGGTAATCGATTT
L595S-rev	GCAGACAGGCGTCGGAGCAGTGCGTGAGCTTGCCGTTCTCCGACGCGCGGCAGGCCGCGCCGGGCCA GTGTTACAACCAATTAACC
Del.599-600-for	TAAGCACGCCGGCGCGGCCTGCCGCGCGTTGGAGAACGGCACGCACTGCTCCGACGCCTGTAGGGAT AACAGGGTAATCGATTT
Del.599-600-rev	GCGCCGCCAGAATGAGCAGACAGGCGTCGGAGCAGTGCGTGCCGTTCTCCAACGCGCGGCGCCAGTG TTACAACCAATTAACC
H469V-for	TGATATTACACCCATGAACGTGCTCATCGACGTGAACCCGGTCAACCCCAGCGAGATCGTGCGTAGG GATAACAGGGTAATCGATTT
H469-rev	TGTAATCGCACAGCGCGGCGCGCACGATCTCGCTGGGGTTGACCGGGTTCACGTCGATGAGCAGCCA GTGTTACAACCAATTAACC
K359Q-for	CTGGCCGCTCGATCGCTATCGCGTGGTCAAGGTGGCGCGTCAGCACAGCGAGACGGTGCTCACTAGG GATAACAGGGTAATCGATTT
K359Q-rev	TCAGGCCCGACATCCAGACCGTGAGCACCGTCTCGCTGTGCTGACGCGCCACCTTGACCACGCGCCA GTGTTACAACCAATTAACC
L397R-for	GCCGCCGTCGCTGGTGGGCACGGGCGTGCACCGCGGTCTGCGCACGGCCACGGGCTGCTGTCTTAGG GATAACAGGGTAATCGATTT
L397R-rev	GTACCGTGACGTTGTGCAGCAGACAGCAGCCCGTGGCCGTGCGCAGACCGCGGTGCACGCCCGGCCA GTGTTACAACCAATTAACC
M460V-for	CAATCACCAGTGTCGTGTATGCCACTTTGATATTACACCCGTGAACGTGCTCATCGACGTGAATAGG GATAACAGGGTAATCGATTT
M460V-rev	TCTCGCTGGGGTTGTGCGGGTTCACGTCGATGAGCACGTTCACGGGTGTAATATCAAAGTGGCGCCA GTGTTACAACCAATTAACC
C480F-for	GAACCCGCACAACCCCAGCGAGATCGTGCGCGCCGCGCTGTTCGATTACAGCCTCAGCGAGCCTAGG GATAACAGGGTAATCGATTT
C480F-rev	GCTCGTTGTAATCCGGATAGGGCTCGCTGAGGCTGTAATCGAACAGCGCGGCGCGCACGATCTGCCA GTGTTACAACCAATTAACC
H520Q-for	CCGCATCCCCAACTGCTCGCACCGTCTGCGCGAATGTTACCAACCTGCTTTCCGACCCATGCCTAGG GATAACAGGGTAATCGATTT
H520Q-rev	AGATGAGCAGCTTCTGCAGCGGCATGGGTCGGAAAGCAGGTTGGTAACATTCGCGCAGACGGTGCCA GTGTTACAACCAATTAACC
C592G-for	GGGTACGGAGGCGTTGCTCTTTAAGCACGCCGGCGCGGCCGGCCGCGCGTTGGAGAACGGCAATAGG GATAACAGGGTAATCGATTT
C592G-rev	CGTCGGAGCAGTGCGTGAGCTTGCCGTTCTCCAACGCGCGGCCGGCCGCGCCGGCGTGCTTAAGCCA GTGTTACAACCAATTAACC
E596G-for	GTTGCTCTTTAAGCACGCCGGCGCGGCCTGCCGCGCGTTGGGGAACGGCAAGCTCACGCACTGTAGG GATAACAGGGTAATCGATTT
E596G-rev	TGAGCAGACAGGCGTCGGAGCAGTGCGTGAGCTTGCCGTTCCCCAACGCGCGGCAGGCCGCGCGCCA GTGTTACAACCAATTAACC
C603W-for	CGCGGCCTGCCGCGCGTTGGAGAACGGCAAGCTCACGCACTGGTCCGACGCCTGTCTGCTCATTAGG GATAACAGGGTAATCGATTT
C603W-rev	AGCTCATTTGCGCCGCCAGAATGAGCAGACAGGCGTCGGACCAGTGCGTGAGCTTGCCGTTCTGCCA GTGTTACAACCAATTAACC

US1-for	CGCATGGGAAGGCTGGACACGCCGACCGAGAGGTCACCGAGCCCGGACGCCATCCTGTGACGGAAGA TCACTTCG
USIR-rev	GGAGCGGAGGAGGTGACCTGGCTGCTTAATGACAGCGACGGAGAGGAAGAAGAGCTGAGGTTCTTAT GGCTCTTG
US1-for	CCGCATGGGAAGGCTGGACACGCCGACCGAGAGGTCACCGAGCCCGGACGCCATCTGCTTCGCGATG TACGGGCCAGATATA
US1-IR-rev	ACCGCGGAGCGGAGGAGGTGACCTGGCTGCTTAATGACAGCGACGGAGAGGAAGAAGAGATTGCAGC ACAGAAAAGCATCTTAC
UL97-for	GGTCTGGACGAGGTGCGCATGGGTACGGAGGCGTTGCTCTTTAAGCACGCCGGCGCGGCCTGCCGCG CGTTGGAGAACCCTGTGACGGAAGATCACTTCG
UL97-rev	CGCCCAGGAGACAGGCGCCGTAGCTCATTTGCGCCGCCAGAATGAGCAGACAGGCGTCGGAGCAGTG CGTGAGCTTGCCCTGAGGTTCTTATGGCTCTTG
UL97-for	GATGCGTGACGGAGAAAAAGAGGACGCGGCTTCGGACAAGGAGAACCAGCGTCGGCCCGTGGTGCCG TCCACGTCCCTGTGACGGAAGATCACTTCG
UL97-rev	GAACGACCACATGGCCGAGGTTTCGCGGCAGCGCAAGCCGTGGTAACCGTCGCCGCTGGCGGCGCTG CCGCGAGACCTGAGGTTCTTATGGCTCTTG
A594V	CTTTAAGCACGCCGGCGCGGCCTGCCGCGTGTTGGAGAACGGCAAGCTCACGCACTGCTCCGACGCC TGTCTGCTCATTC
P132L	GCGGCTTCGGACAAGGAGAACCAGCGTCGGCCCGTGGTGCTGTCCACGTCGTCTCGCGGCAGCGCCG CCAGCGGCGACGGT
236-275 For	AGAAAACGACGTGGAGCTGCGCGCGGAAAGTCAGGACAGCAACGACCAGATCATCACCACTAGGGAT AACAGGGTAATCGATTT
236-275 Rev	ACGTAAGGCCGCGGATGGACGTGGTGATGATCTGGTCGTTGCTGTCCTGACTTTCCGCGCGCCAGTG TTACAACCAATTAACC
241-270 For	GCTGCGCGCGGAAAGTCAGGACAGCGCCGTGGCATCGGGCCATTGCACCTGTTCCAACGATAGGGAT AACAGGGTAATCGATTT
241-270 Rev	TGGACGTGGTGATGATCTGGTCGTTGGAACAGGTGCAATGGCCCGATGCCACGGCGCTGTGCCAGTG TTACAACCAATTAACC
246-265-For	TCAGGACAGCGCCGTGGCATCGGGCCCGGGCCGCATTCCGTCACACGACGACGTGCATTGTAGGGAT AACAGGGTAATCGATTT
246-265-Rev	TCTGGTCGTTGGAACAGGTGCAATGCACGTCGTCGTGTGACGGAATGCGGCCCGGGCCCGGCCAGTG TTACAACCAATTAACC
251-260 For	GGCATCGGGCCCGGGCCGCATTCCGCAGCCGCTCAGCGGTGAGGCCGACTCCACGTCACATAGGGAT AACAGGGTAATCGATTT
251-260 Rev	AGGTGCAATGCACGTCGTCGTGTGACGTGGAGTCGGCCTCACCGCTGAGCGGCTGCGGAAGCCAGTG TTACAACCAATTAACC

Table S3. Sequences, primers, target exon, on-target and off-target scores for CRISPR/Cas9 KO.

Name	Sequence	Primer	Exon	On-target	Off-target
Cyclin B1 (A)-For	AGGCGCAAAGCGCGT TCCTA	CACCGAGGCGCAAAGCGC GTTCCTA	2	47.3	96.0
Cyclin B1 (A)-Rev		AAACTAGGAACGCGCTTT GCGCCTC			
Cyclin B1 (B)-For	CCTAATTGACTGGCT AGTAC	CACCGCCTAATTGACTGG CTAGTAC	5	50.0	85.8
Cyclin B1 (B)-Rev		AAACGTACTAGCCAGTCA ATTAGGC			
Cyclin B1 (C)-For	CCATGGCGCTCCGAG TCACC	CACCGCCATGGCGCTCCG AGTCACC	1	46.5	85.6
Cyclin B1 (C)-Rev		AAACGGTGACTCGGAGCG CCATGGC			
Cyclin T1 (A)-For	CCACGCCAAAACGAC GGGAT	CACCGCCACGCCAAAACG ACGGGAT	1	62.6	95.9
Cyclin T1 (A)-Rev		AAACATCCCGTCGTTTTG GCGTGGC			

Cyclin T1 (B)-For	AGAACTTTCTTATCGCCAGC	CACCGAGAACTTTCTTATCGCCAGC	1	55.7	82.1
Cyclin T1 (B)-Rev		AAACGCTGGCGATAAGAAAGTTCTC			
Cyclin T1 (C)-For	GTTTCTAGCAGCTAAAGTGG	CACCGGTTTCTAGCAGCTAAAGTGG	3	69.3	70.7
Cyclin T1 (C)-Rev		AAACCCACTTTAGCTGCTAGAAACC			
Cyclin H (A)-For	GCCGCTTCTGACTACTGTTG	CACCGGCCGCTTCTGACTACTGTTG	1	64.5	82.9
Cyclin H (A)-Rev		AAACCAACAGTAGTCAGAAGCGGCC			
Cyclin H (B)-For	GTCCAAGAGGACTCTCCCGG	CACCGGTCCAAGAGGACTCTCCCGG	4	73.4	82.5
Cyclin H (B)-Rev		AAACCCGGGAGAGTCCTCTTGGACC			
Cyclin H (C)-For	ATTCTCCAATATGGGATAGC	CACCGATTCTCCAATATGGGATAGC	5	60.5	79.0
Cyclin H (C)-Rev		AAACGCTATCCCATATTGGAGAATC			
Cyclin H (E)-For	CCGGGAGAGTCCTCTTGGAC	CACCGCCGGGAGAGTCCTCTTGGAC	4	52.8	44.0
Cyclin H (E)-Rev		AAACGTCCAAGAGGACTCTCCCGGC			
Cyclin H (F)-For	CAGTAATGGAATATCACCCC	CACCGCAGTAATGGAATATCACCCC	3	62.5	43.1
Cyclin H (F)-Rev		AAACGGGGTGATATTCCATTACTGC			