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**Supplementary Data**

**Human cytomegalovirus RNA2.7 inhibits RNA polymerase II (Pol II) Serine-2 phosphorylation by reducing the interaction between Pol II and phosphorylated cyclin-dependent kinase 9 (pCDK9)**

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**Supplementary Table S1** Genes involved host gene activation.

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| --- | --- | --- | --- |
| Symbol | Entrez gene name | Fold Changes | |
| HAN | HAN  ΔRNA2.7 |
| EPCAM | Epithelial cell adhesion molecule | 24.76 | 47.13 |
| ATF3 | Activating transcription factor 3 | 17.35 | 34.09 |
| IFI27 | Interferon, alpha-inducible protein 27 | 27.68 | 32.66 |
| WT1 | Wilms tumor 1 | 10.05 | 30.75 |
| TRIB3 | Tribbles pseudokinase 3 | 10.67 | 20.94 |
| ZNF367 | Zinc finger protein 367 | 8.14 | 20.09 |
| FZD5 | Frizzled class receptor 5 | 9.90 | 19.75 |
| ONECUT2 | One cut homeobox 2 | 14.09 | 16.40 |
| HDAC9 | Histone deacetylase 9 | 6.31 | 10.49 |
| TFAP2C | Transcription factor AP-2 gamma (activating enhancer binding protein 2 gamma) | 6.04 | 10.38 |
| RORA | RAR-related orphan receptor A | 6.54 | 10.23 |
| DDIT3 | DNA-damage-inducible transcript 3 | 3.91 | 9.18 |
| CEBPA | CCAAT/enhancer binding protein (C/EBP), alpha | 6.67 | 9.05 |
| GRHL1 | Grainyhead-like 1 (Drosophila) | 4.41 | 8.59 |
| SOX17 | SRY (sex determining region Y)-box 17 | 4.90 | 6.26 |
| MXD1 | MAX dimerization protein 1 | 4.01 | 6.13 |
| CEBPG | CCAAT/enhancer binding protein (C/EBP), gamma | 3.70 | 6.00 |
| PRKCB | Protein kinase C, beta | 3.16 | 5.77 |
| POLR3G | Polymerase (RNA) III (DNA directed) polypeptide G (32kD) | 3.46 | 5.68 |
| F2RL1 | Coagulation factor II (thrombin) receptor-like 1 | 2.50 | 5.26 |
| TEAD4 | TEA domain family member 4 | 4.33 | 5.16 |
| MEF2C | Myocyte enhancer factor 2C | 5.52 | 5.06 |
| GATA3 | GATA binding protein 3 | 2.42 | 5.03 |
| HES1 | Hes family bHLH transcription factor 1 | 5.77 | 4.92 |
| KLF7 | Kruppel-like factor 7 (ubiquitous) | 3.50 | 4.92 |
| CCRN4L | CCR4 carbon catabolite repression 4-like (S. cerevisiae) | 2.49 | 4.71 |
| NHLH2 | Nescient helix loop helix 2 | 3.42 | 4.63 |
| PAWR | PRKC, apoptosis, WT1, regulator | 4.06 | 4.63 |
| TCF19 | Transcription factor 19 | 2.04 | 4.51 |
| EOMES | Eomesodermin | 4.02 | 4.47 |
| ELK4 | ETS-domain protein (SRF accessory protein 1) | 4.65 | 4.45 |
| GABPB1 | GA binding protein transcription factor | 2.85 | 4.35 |
| IL6 | Interleukin 6 | 4.01 | 4.26 |
| LRRFIP1 | Leucine rich repeat (in FLII) interacting protein 1 | 3.41 | 4.16 |
| RUNX3 | Runt-related transcription factor 3 | 3.93 | 3.99 |
| KLF15 | Kruppel-like factor 15 | 2.32 | 3.98 |
| DDX58 | DEAD (Asp-Glu-Ala-Asp) box polypeptide 58 | 4.14 | 3.83 |
| SP4 | Sp4 transcription factor | 2.34 | 3.81 |
| KLF5 | Kruppel-like factor 5 (intestinal) | 3.18 | 3.66 |
| GCFC2 | GC-rich sequence DNA-binding factor 2 | 2.37 | 3.57 |
| NR2C2 | Nuclear receptor subfamily 2, group C, member 2 | 2.57 | 3.54 |
| KLF2 | Kruppel-like factor 2 | 2.72 | 3.51 |
| FOXO1 | Forkhead box O1 | 2.94 | 3.47 |
| TNFSF11 | Tumor necrosis factor (ligand) superfamily, member 11 | 4.05 | 3.32 |
| FNIP1 | Folliculin interacting protein 1 | 2.32 | 3.31 |
| SUV39H2 | Suppressor of variegation 3-9 homolog 2 (Drosophila) | 2.26 | 3.15 |
| TFEB | Transcription factor EB | 2.62 | 3.14 |
| INSM1 | Insulinoma-associated 1 | 4.08 | 3.07 |
| OTUD7B | OTU deubiquitinase 7B | 2.02 | 3.02 |
| ZNF174 | Zinc finger protein 174 | 2.87 | 2.98 |
| CXCL10 | Chemokine (C-X-C motif) ligand 10 | 3.38 | 2.97 |
| NFYA | Nuclear transcription factor Y, alpha | 2.05 | 2.97 |
| POLR2D | Polymerase (RNA) II (DNA directed) polypeptide D | 2.03 | 2.79 |
| HEY1 | Hes-related family bHLH transcription factor with YRPW motif 1 | 3.23 | 2.78 |
| FGF2 | Fibroblast growth factor 2 (basic) | 3.20 | 2.74 |
| BMP6 | Bone morphogenetic protein 6 | 5.56 | 2.73 |
| NACC2 | NACC family member 2, BEN and BTB (POZ) domain containing | 2.10 | 2.72 |
| SETD8 | SET domain containing (lysine methyltransferase) 8 | 2.05 | 2.72 |
| BHLHE40 | Basic helix-loop-helix family, member e40 | 3.22 | 2.69 |
| ZNF141 | Zinc finger protein 141 | 2.19 | 2.68 |
| STAT1 | Signal transducer and activator of transcription 1, 91kDa | 3.38 | 2.61 |
| CSRNP1 | Cysteine-serine-rich nuclear protein 1 | 2.99 | 2.56 |
| RFX3 | Regulatory factor X, 3 (influences HLA class II expression) | 2.26 | 2.56 |
| ARNTL | Aryl hydrocarbon receptor nuclear translocator-like | 2.14 | 2.54 |
| LIF | Leukemia inhibitory factor | 2.45 | 2.50 |
| NPAS2 | Neuronal PAS domain protein 2 | 2.83 | 2.49 |
| VEGFA | Vascular endothelial growth factor A | 2.54 | 2.36 |
| MEF2D | Myocyte enhancer factor 2D | 2.35 | 2.35 |
| KLF12 | Kruppel-like factor 12 | 2.07 | 2.19 |
| GATA2 | GATA binding protein 2 | 3.06 | 2.18 |
| PID1 | Phosphotyrosine interaction domain containing 1 | 2.14 | 2.17 |
| XBP1 | X-box binding protein 1 | 2.53 | 2.15 |
| ETV5 | Ets variant 5 | 2.06 | 2.12 |
| MDM2 | MDM2 proto-oncogene, E3 ubiquitin protein ligase | 2.22 | 2.10 |
| MEF2A | Myocyte enhancer factor 2A | 2.37 | 2.10 |
| SPEN | Spen family transcriptional repressor | 2.28 | 2.05 |
| BMP2 | Bone morphogenetic protein 2 | 2.34 | 2.04 |
| ARNTL2 | Aryl hydrocarbon receptor nuclear translocator-like 2 | 2.05 | 2.03 |
| TSC22D1 | TSC22 domain family, member 1 | 2.57 | 2.00 |
| SUB1 | SUB1 homolog (S. cerevisiae) | −2.64 | −2.02 |
| ZFHX3 | Zinc finger homeobox 3 | −2.49 | −2.05 |
| SMAD3 | SMAD family member 3 | −2.34 | −2.10 |
| VEZF1 | Vascular endothelial zinc finger 1 | −2.19 | −2.10 |
| TCF12 | Transcription factor 12 | −2.22 | −2.22 |
| MED17 | Mediator complex subunit 17 | −2.28 | −2.27 |
| CDKN2A | Cyclin-dependent kinase inhibitor 2A | −2.06 | −2.36 |
| BPTF | Bromodomain PHD finger transcription factor | −2.44 | −2.37 |
| NR1H3 | Nuclear receptor subfamily 1, group H, member 3 | −2.18 | −2.46 |
| EID1 | EP300 interacting inhibitor of differentiation 1 | −2.75 | −2.54 |
| NFIX | Nuclear factor I/X (CCAAT-binding transcription factor) | −2.31 | −2.67 |
| CTNNB1 | Catenin (cadherin-associated protein), beta 1, 88kDa | −2.06 | −2.68 |
| TRIM27 | Tripartite motif containing 27 | −2.20 | −2.69 |
| EDNRB | Endothelin receptor type B | −2.23 | −2.70 |
| MYOCD | Myocardin | −3.62 | −2.70 |
| PIR | Pirin (iron-binding nuclear protein) | −3.41 | −2.74 |
| TAF9B | TAF9B RNA polymerase II, TATA box binding protein (TBP)-associated factor | −2.05 | −2.74 |
| NFIA | Nuclear factor I/A | −2.80 | −2.94 |
| CEBPD | CCAAT/enhancer binding protein (C/EBP), delta | −2.17 | −3.26 |
| SOX11 | SRY (sex determining region Y)-box 11 | −2.08 | −3.34 |
| ELP2 | Elongator acetyltransferase complex subunit 2 | −4.23 | −3.75 |
| IGF1 | Insulin-like growth factor 1 (somatomedin C) | −4.36 | −3.82 |
| TADA2A | Transcriptional adaptor 2A | −8.34 | −3.93 |
| MEOX2 | Mesenchyme homeobox 2 | −4.71 | −3.98 |
| TCF25 | Transcription factor 25 (basic helix-loop-helix) | −4.19 | −3.98 |
| DKK1 | Dickkopf WNT signaling pathway inhibitor 1 | −2.93 | −4.37 |
| SNCA | Synuclein, alpha (non A4 component of amyloid precursor) | −2.43 | −4.42 |
| BMP5 | Bone morphogenetic protein 5 | −2.66 | −4.44 |
| TPR | Translocated promoter region, nuclear basket protein | −2.85 | −4.54 |
| RGCC | Regulator of cell cycle | −2.50 | −4.67 |
| DDX5 | DEAD (Asp-Glu-Ala-Asp) box helicase 5 | −4.19 | −4.78 |
| CHD3 | Chromodomain helicase DNA binding protein 3 | −2.26 | −8.75 |
| AFF4 | AF4/FMR2 family, member 4 | −2.34 | 3.49 |
| HMGA2 | High mobility group AT-hook 2 | 3.71 | −2.04 |
| PAX6 | Paired box 6 |  | 93.44 |
| MNX1 | Motor neuron and pancreas homeobox 1 |  | 16.60 |
| SOX2 | SRY (sex determining region Y)-box 2 |  | 10.65 |
| GATA5 | GATA binding protein 5 |  | 9.72 |
| USP2 | Ubiquitin specific peptidase 2 |  | 8.52 |
| MYBL2 | V-myb avian myeloblastosis viral oncogene homolog-like 2 |  | 8.20 |
| HOXC6 | Homeobox C6 |  | 7.78 |
| HNF4G | Hepatocyte nuclear factor 4, gamma |  | 7.41 |
| CD40 | CD40 molecule, TNF receptor superfamily member 5 |  | 7.35 |
| MESP1 | Mesoderm posterior basic helix-loop-helix transcription factor 1 |  | 6.69 |
| PROX1 | Prospero homeobox 1 |  | 6.64 |
| PGR | Progesterone receptor |  | 5.56 |
| CNOT1 | CCR4-NOT transcription complex, subunit 1 |  | 5.30 |
| GTF2A1 | General transcription factor IIA, 1, 19/37kDa |  | 5.17 |
| BATF3 | basic leucine zipper transcription factor, ATF-like 3 |  | 5.01 |
| MET | MET proto-oncogene, receptor tyrosine kinase |  | 4.16 |
| LRP6 | Low density lipoprotein receptor-related protein 6 |  | 4.08 |
| ETV7 | Ets variant 7 |  | 4.04 |
| E2F7 | E2F transcription factor 7 |  | 3.93 |
| GABPA | GA binding protein transcription factor, alpha subunit 60kDa |  | 3.86 |
| ARRB2 | Arrestin, beta 2 |  | 3.31 |
| IRF4 | Interferon regulatory factor 4 |  | 3.31 |
| EZH2 | Enhancer of zeste 2 polycomb repressive complex 2 subunit |  | 3.30 |
| PPARGC1B | Peroxisome proliferator-activated receptor gamma, coactivator 1 beta |  | 3.23 |
| CKAP2 | Cytoskeleton associated protein 2 |  | 3.18 |
| HOXA10 | Homeobox A10 |  | 3.18 |
| NCOA3 | Nuclear receptor coactivator 3 |  | 3.18 |
| TAL1 | T-cell acute lymphocytic leukemia 1 |  | 3.18 |
| BRCA1 | Breast cancer 1, early onset |  | 3.17 |
| RPS6KA1 | Ribosomal protein S6 kinase, 90kDa, polypeptide 1 |  | 3.11 |
| MED30 | Mediator complex subunit 30 |  | 3.01 |
| ZNF593 | Zinc finger protein 593 |  | 2.94 |
| TAF5L | TAF5-like RNA polymerase II, p300/CBP-associated factor (PCAF)-associated factor |  | 2.93 |
| CHCHD3 | Coiled-coil-helix-coiled-coil-helix domain containing 3 |  | 2.91 |
| TAF1A | TATA box binding protein (TBP)-associated factor, RNA polymerase I, A |  | 2.90 |
| POU4F2 | POU class 4 homeobox 2 |  | 2.88 |
| PLK3 | polo-like kinase 3 |  | 2.84 |
| BCL11B | P-cell CLL/lymphoma 11B (zinc finger protein) |  | 2.80 |
| TET2 | Tet methylcytosine dioxygenase 2 |  | 2.79 |
| NFAT5 | Nuclear factor of activated T-cells 5, tonicity-responsive |  | 2.72 |
| NUFIP1 | Nuclear fragile X mental retardation protein interacting protein 1 |  | 2.70 |
| SETX | Senataxin |  | 2.70 |
| GTF2H2 | General transcription factor IIH, polypeptide 2, 44kDa |  | 2.69 |
| DR1 | Down-regulator of transcription 1, TBP-binding (negative cofactor 2) |  | 2.60 |
| FOXA3 | Forkhead box A3 |  | 2.60 |
| FOXK2 | Forkhead box K2 |  | 2.59 |
| ELP4 | Elongator acetyltransferase complex subunit 4 |  | 2.58 |
| VPRBP | Vpr (HIV-1) binding protein |  | 2.58 |
| NCOA1 | Nuclear receptor coactivator 1 |  | 2.57 |
| PITX2 | Paired-like homeodomain 2 |  | 2.53 |
| CPEB3 | Cytoplasmic polyadenylation element binding protein 3 |  | 2.51 |
| BUD31 | BUD31 homolog (S. cerevisiae) |  | 2.50 |
| HOXD8 | Homeobox D8 |  | 2.49 |
| CBX4 | Chromobox homolog 4 |  | 2.47 |
| PHIP | Pleckstrin homology domain interacting protein |  | 2.44 |
| TFAM | Transcription factor A, mitochondrial |  | 2.44 |
| FNIP2 | Folliculin interacting protein 2 |  | 2.41 |
| HSF2 | Heat shock transcription factor 2 |  | 2.41 |
| KLF11 | Kruppel-like factor 11 |  | 2.41 |
| CRY1 | Cryptochrome circadian clock 1 |  | 2.40 |
| HHEX | Hematopoietically expressed homeobox |  | 2.38 |
| BEX1 | Brain expressed, X-linked 1 |  | 2.34 |
| DNMT3B | DNA (cytosine-5-)-methyltransferase 3 beta |  | 2.34 |
| E2F1 | E2F transcription factor 1 |  | 2.33 |
| TET3 | Tet methylcytosine dioxygenase 3 |  | 2.33 |
| ZNF354A | Zinc finger protein 354A |  | 2.31 |
| IVNS1ABP | Influenza virus NS1A binding protein |  | 2.30 |
| KAT2B | K(lysine) acetyltransferase 2B |  | 2.29 |
| TNKS | Tankyrase, TRF1-interacting ankyrin-related ADP-ribose polymerase |  | 2.29 |
| ALX1 | ALX homeobox 1 |  | 2.28 |
| CHD1 | Chromodomain helicase DNA binding protein 1 |  | 2.27 |
| NFATC3 | Nuclear factor of activated T-cells, cytoplasmic, calcineurin-dependent 3 |  | 2.26 |
| CIAO1 | Cytosolic iron-sulfur assembly component 1 |  | 2.25 |
| TCEB3 | Transcription elongation factor B (SIII), polypeptide 3 (110kDa, elongin A) |  | 2.25 |
| SUV39H1 | Suppressor of variegation 3-9 homolog 1 (Drosophila) |  | 2.23 |
| CGGBP1 | CGG triplet repeat binding protein 1 |  | 2.21 |
| ELP3 | Elongator acetyltransferase complex subunit 3 |  | 2.21 |
| CAMTA2 | Calmodulin binding transcription activator 2 |  | 2.20 |
| MED13 | Mediator complex subunit 13 |  | 2.20 |
| MITF | Microphthalmia-associated transcription factor |  | 2.20 |
| BLZF1 | Basic leucine zipper nuclear factor 1 |  | 2.17 |
| FOXA1 | Forkhead box A1 |  | 2.17 |
| TRIM24 | Tripartite motif containing 24 |  | 2.17 |
| MAFF | V-maf avian musculoaponeurotic fibrosarcoma oncogene homolog F |  | 2.15 |
| ATF5 | Activating transcription factor 5 |  | 2.13 |
| HMGB2 | High mobility group box 2 |  | 2.13 |
| SMAD2 | SMAD family member 2 |  | 2.12 |
| CREBRF | CREB3 regulatory factor |  | 2.08 |
| CRLF3 | Cytokine receptor-like factor 3 |  | 2.08 |
| MYO6 | Myosin VI |  | 2.08 |
| EPC1 | Enhancer of polycomb homolog 1 (Drosophila) |  | 2.07 |
| NFATC1 | Nuclear factor of activated T-cells, cytoplasmic, calcineurin-dependent 1 |  | 2.05 |
| FOSL1 | FOS-like antigen 1 |  | 2.04 |
| CDC73 | Cell division cycle 73 |  | 2.03 |
| HCFC2 | Host cell factor C2 |  | 2.03 |
| HIRA | Histone cell cycle regulator |  | 2.03 |
| RIPK1 | Receptor (TNFRSF)-interacting serine-threonine kinase 1 |  | 2.02 |
| ASXL2 | Additional sex combs like transcriptional regulator 2 |  | 2.01 |
| RITA1 | RBPJ interacting and tubulin associated 1 |  | 2.01 |
| ATF7 | Activating transcription factor 7 |  | 2.00 |
| CBX6 | Chromobox homolog 6 |  | −2.01 |
| MLX | MLX, MAX dimerization protein |  | −2.01 |
| RNASEL | Ribonuclease L (2',5'-oligoisoadenylate synthetase-dependent) |  | −2.01 |
| MAML2 | Mastermind-like 2 (Drosophila) |  | −2.02 |
| MZF1 | Myeloid zinc finger 1 |  | −2.03 |
| NR2F1 | Nuclear receptor subfamily 2, group F, member 1 |  | −2.04 |
| SNAPC3 | Small nuclear RNA activating complex, polypeptide 3, 50kDa |  | −2.04 |
| ETS2 | V-ets avian erythroblastosis virus E26 oncogene homolog 2 |  | −2.05 |
| PRDM16 | PR domain containing 16 |  | −2.06 |
| MED16 | Mediator complex subunit 16 |  | −2.07 |
| HEXIM1 | Hexamethylene bis-acetamide inducible 1 |  | −2.08 |
| HDAC4 | Histone deacetylase 4 |  | −2.10 |
| ORC2 | Origin recognition complex, subunit 2 |  | −2.10 |
| RXRA | Retinoid X receptor, alpha |  | −2.10 |
| ZHX1 | Zinc fingers and homeoboxes 1 |  | −2.10 |
| UBE2I | Ubiquitin-conjugating enzyme E2I |  | −2.11 |
| SOX4 | SRY (sex determining region Y)-box 4 |  | −2.12 |
| TCF4 | Transcription factor 4 |  | −2.12 |
| FHL2 | Four and a half LIM domains 2 |  | −2.13 |
| TEF | Thyrotrophic embryonic factor |  | −2.13 |
| FST | Follistatin |  | −2.14 |
| H2AFY | H2A histone family, member Y |  | −2.15 |
| ZBTB1 | Zinc finger and BTB domain containing 1 |  | −2.16 |
| SNAI2 | Snail family zinc finger 2 |  | −2.18 |
| TBX5 | T-box 5 |  | −2.18 |
| SATB1 | SATB homeobox 1 |  | −2.22 |
| HMGB1 | High mobility group box 1 |  | −2.24 |
| NR2F2 | Nuclear receptor subfamily 2, group F, member 2 |  | −2.24 |
| TGFB1I1 | Transforming growth factor beta 1 induced transcript 1 |  | −2.24 |
| TBL1XR1 | Transducin (beta)-like 1 X-linked receptor 1 |  | −2.25 |
| PRDM5 | PR domain containing 5 |  | −2.28 |
| IL33 | Interleukin 33 |  | −2.31 |
| CCND1 | Cyclin D1 |  | −2.32 |
| ARID5B | AT rich interactive domain 5B (MRF1-like) |  | −2.35 |
| GLI2 | GLI family zinc finger 2 |  | −2.38 |
| BRD3 | Bromodomain containing 3 |  | −2.40 |
| ATRX | Alpha thalassemia/mental retardation syndrome X-linked |  | −2.42 |
| MECP2 | Methyl CpG binding protein 2 |  | −2.48 |
| CSRNP3 | Cysteine-serine-rich nuclear protein 3 |  | −2.49 |
| BCL11A | B-cell CLL/lymphoma 11A (zinc finger protein) |  | −2.52 |
| SMAD4 | SMAD family member 4 |  | −2.55 |
| MSC | Musculin |  | −2.56 |
| TCF3 | Transcription factor 3 |  | −2.57 |
| CBX2 | Chromobox homolog 2 |  | −2.63 |
| TCF21 | Transcription factor 21 |  | −2.80 |
| FOXF1 | Forkhead box F1 |  | −2.97 |
| DBP | D site of albumin promoter (albumin D-box) binding protein |  | −3.05 |
| PPARGC1A | Peroxisome proliferator-activated receptor gamma, coactivator 1 alpha |  | −3.07 |
| STAT6 | Signal transducer and activator of transcription 6, interleukin-4 induced |  | −3.15 |
| KANK2 | KN motif and ankyrin repeat domains 2 |  | −3.39 |
| FOXJ2 | Forkhead box J2 |  | −3.82 |
| H2AFY2 | H2A histone family, member Y2 |  | −3.85 |
| HOXA5 | Homeobox A5 |  | −3.99 |
| RBPJ | Recombination signal binding protein for immunoglobulin kappa J region |  | −4.05 |
| MAVS | Mitochondrial antiviral signaling protein |  | −5.27 |

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**Supplementary Fig. S1** Construction of HCMV RNA2.7 deleted mutant. **A** Schematic diagram showing genomic location of HCMV RNA2.7. RNA2.7 is indicated in black bar. **B** Schematic diagram showing the deletion of HCMV RNA2.7 by homologous reconbination. A kanamycin resistance gene was inserted into the RNA2.7 locus. **C** Viral genomes were assessed with restriction endonuclease *Eco*R I and *Spe* I. M, marker. **D** Validationof RNA2.7 deletion. Transcription of RNA2.7 could not be detected in HELF cells infected with HANΔRNA2.7. HCMV UL83 was amplified as a positive control. **E** Quantitative PCR of selected viral genes. HELF cells were infected with HAN or HANΔRNA2.7 (MOI = 1.0). Transcriptions of RNA2.7 flanking genes (RL1, RL6, RL8A and RL9A), viral immediate early (UL123), early (UL44 and UL55) and late (UL83 and UL99) genes were measured. Data are presented as mean ± SEM.

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**Supplementary Fig. S2** No interaction between RNA2.7C2c and phospho-CDK9 protein.No change was found after competitive RNA or anti-pCDK9 antibody was added into the EMSA systems.

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**Supplementary Fig. S3** Pathway analysis indicating effects of RNA2.7 on cell cycle control. **A** Results of pathway analysis indicating effects of RNA2.7 on pathways involved in cell cycle regulation. **B** Heatmap showing that 11 genes involved in cell cycle control of chromosomal replication are increased in cells infected with HANΔRNA2.7.