

SUPPLEMENTARY TABLES

Supplementary Table 1. KEGG pathway annotation on 44 SNHG4-related genes.

#term ID	term description	observed gene count	background gene count	false discovery rate	matching proteins in your network (IDs)	matching proteins in your network (labels)
hsa03030	DNA replication	2	36	0	ENSP00000264156, ENSP00000369411	MCM6,RFC3
hsa03430	Mismatch repair	2	23	0	ENSP00000355506, ENSP00000369411	EXO1,RFC3
hsa04110	Cell cycle	3	##	0	ENSP00000264156, ENSP00000378699, ENSP00000405726	CDC45,CDK1,MCM6

Supplementary Table 2. GO functional analysis on 44 SNHG4-related genes.

#term ID	term description	observed gene count	background gene count	false discovery rate	matching proteins in your network (IDs)	matching proteins in your network (labels)
GO:0003697	single-stranded DNA binding	4	99	0	ENSP00000264156, ENSP00000309595, ENSP00000405726, ENSP00000418268	C10orf2,CDC45,MCM10, MCM6
GO:0140097	catalytic activity, acting on DNA	5	##	0	ENSP00000264156, ENSP00000309595, ENSP00000328835, ENSP00000355506, ENSP00000405726	C10orf2,CDC45,EXO1,M CM6, TOP1MT
GO:0003678	DNA helicase activity	3	41	0	ENSP00000264156, ENSP00000309595, ENSP00000405726	C10orf2,CDC45,MCM6
GO:0017111	nucleoside-triphosphatase activity	8	##	0	ENSP00000260363, ENSP00000264156, ENSP00000309595, ENSP00000356319, ENSP00000369411, ENSP00000377601, ENSP00000378356, ENSP00000405726	C10orf2,CDC45,HELLS, KIF14, KIF20A,KIF23,MCM6,R FC3
GO:0004386	helicase activity	4	##	0	ENSP00000264156, ENSP00000309595, ENSP00000377601, ENSP00000405726	C10orf2,CDC45,HELLS, MCM6
GO:0003688	DNA replication origin binding	2	14	0	ENSP00000405726, ENSP00000418268	CDC45,MCM10
GO:0008144	drug binding	11	##	0	ENSP00000260363, ENSP00000264156, ENSP00000309595, ENSP00000348838, ENSP00000355966,	C10orf2,CDK1,HELLS,K IF14, KIF20A,KIF23,MCM6,N EK2, NOLC1,PPIL1,UBE2C

					ENSP00000356319, ENSP00000362803, ENSP00000377601, ENSP00000378356, ENSP00000378699, ENSP00000385410	
GO:0005524	ATP binding	10	##	0	ENSP00000260363, ENSP00000264156, ENSP00000309595, ENSP00000348838, ENSP00000355966, ENSP00000356319, ENSP00000377601, ENSP00000378356, ENSP00000378699, ENSP00000385410	C10orf2,CDK1,HELLS,KIF14, KIF20A,KIF23,MCM6,NEK2, NOLC1,UBE2C
GO:0003777	microtubule motor activity	3	##	0	ENSP00000260363, ENSP00000356319, ENSP00000378356	KIF14,KIF20A,KIF23
GO:0008139	nuclear localization sequence binding	2	28	0	ENSP00000346453, ENSP00000385410	IPO4,NOLC1
GO:1901363	heterocyclic compound binding	20	##	0	ENSP00000240488, ENSP00000260363, ENSP00000264156, ENSP00000309595, ENSP00000322180, ENSP00000328835, ENSP00000331879, ENSP00000348838, ENSP00000355506, ENSP00000355925, ENSP00000355966, ENSP00000356319, ENSP00000369411, ENSP00000377601, ENSP00000378356, ENSP00000378699, ENSP00000385410, ENSP00000405726, ENSP00000418268, ENSP00000443647	AUNIP,C10orf2,CDC45,CDK1, DSCC1,EXO1,HELLS,KIF14,KIF20A, KIF23,MCM10,MCM6,MND1,NEK2, NOLC1,PRMT3,PROX1, RFC3, TOP1MT,UBE2C
GO:0097159	organic cyclic compound binding	20	##	0	ENSP00000240488, ENSP00000260363, ENSP00000264156, ENSP00000309595, ENSP00000322180, ENSP00000328835, ENSP00000331879, ENSP00000348838, ENSP00000355506, ENSP00000355925, ENSP00000355966,	AUNIP,C10orf2,CDC45,CDK1, DSCC1,EXO1,HELLS,KIF14, KIF20A,KIF23,MCM10, MCM6, MND1,NEK2,NOLC1,PRMT3, PROX1,RFC3,TOP1MT, UBE2C

					ENSP00000356319, ENSP00000369411, ENSP00000377601, ENSP00000378356, ENSP00000378699, ENSP00000385410, ENSP00000405726, ENSP00000418268, ENSP00000443647	
GO:0003677	DNA binding	12	##	0	ENSP00000240488, ENSP00000264156, ENSP00000309595, ENSP00000322180, ENSP00000328835, ENSP00000355506, ,ENSP00000355925, ENSP00000369411, ENSP00000385410, ENSP00000405726, ENSP00000418268, ENSP00000443647	AUNIP,C10orf2,CDC45, DSCC1, EXO1,MCM10,MCM6,M ND1, NOLC1,PROX1,RFC3,T OP1MT
GO:0019899	enzyme binding	11	##	0	ENSP00000265295, ENSP00000309595, ENSP00000314897, ENSP00000346453, ENSP00000348838, ENSP00000355966, ENSP00000356319, ENSP00000376457, ENSP00000378356, ENSP00000385410, ENSP00000418268	ANGPT2,C10orf2,ECT2,I PO4,KIF14, KIF20A,MCM10,NEK2, NOLC1, SPDL1,UBE2C
GO:0097367	carbohydrate derivative binding	11	##	0	ENSP00000260363, ENSP00000264156, ENSP00000309595, ENSP00000348838, ENSP00000355966, ENSP00000356319, ENSP00000377492, ENSP00000377601, ENSP00000378356, ENSP00000378699, ENSP00000385410	C10orf2,CDK1,HELLS,H MMR, KIF14,KIF20A,KIF23,M CM6, NEK2,NOLC1,UBE2C

Supplementary Table 3. The primer sequence.

Name	Forward	Reverse
QPCR-SNHG4	ACCGAAGCCACGCCAGTA	TCACCTGCCACTATTTCTCCC
QPCR-GAPDH	ACAGCCTCAAGATCATCAGC	GGTCATGAGTCCCTCCACGAT
QPCR-CDK1	AAACTACAGGTCAAGTGGTAGCC	TCCTGCATAAGCACATCCTGA
QPCR-miR-590-3p	RT:GTCGTATCCAGTGC GTGTCGTGGAGT CGGCAATTGCACTGGATACGACACTAGC F: GCCGGCCTAATTTTATGTATAA	CAGTGC GTGTCGTGGA
QPCR-U6	CTCGCTTCGGCAGCACA	AACGCTTCACGAATTTGCGT
Si-NC	UUCUCCGAACGUGUCACGUTT	ACGUGACACGUUCGGAGAATT
Si-SNHG4 1#	UAUUUCCUCCCUUCAGAUGTT	CAUCUGAAGGGAGGAAAUATT
Si-SNHG4 2#	ACUACAUAACGUUACUUAUUCTT	GAUAAGUAACGUUAUGUAGUTT
Si-SNHG4 3#	ACAUAACGUUACUUAUCUUGTT	CAAGUAAGUAACGUUAUGUTT
MiR-NC mimics	UUCUCCGAACGUGUCACGUTT	ACGUGACACGUUCGGAGAATT
MiR-590-3p mimics	UAAUUUUUAUGUAUAAGCUAGU	UAGCUUAUACAUAUUUUUAUU
Inhibitor NC	CAGUACUUUUGUGUAGUACAA	
MiR-590-3p inhibitor	ACUAGCUUAUACAUAUUUUUA	
Wt-CDK1 3'UTR	aattctaggcgategctcgagATGAATTTAAATAT AATTCTGTAAATGTGTGTA	at tt t t a t t c g g g c c a g c g g c c g c TATTCATCTTTAG CCAGGTTGTATAGTTAA
mut-CDK1 3'UTR	GAACTACtttttattAGGAAAATGCTAAGTT CAAGTTTCG	CCTaataaaaaGTAGTTCCA ACTACAGGAA AATAAAACTG
Wt-SNHG4	aattctaggcgategctcgagAGATGCCTTCACCT GAATGACAT	at tt t a t t c g g g c c a g c g g c c g c TGAGGCAGGAGA ATCGCTTG
mut-SNHG4	GGGGACTtttttaaTGATGTGAAAAATTAT GTAGAGTATCAGACT	TCAtttaaaaaAGTCCCCTACCCCATCTGA GC
Lentivirus Anti-NC sequence	CAGTACTTTGTGTAGTACAACGCGCAGTA CTTTGTGTAGTACAACGCGCAGTACTTTG TG TAGTACAACGCGCAGTACTTTGTGTAG TACAACGCGCAGTACTTTGTGTAGTACAA CGCGCAGTACTTTGTGTAGTACAACGCGC AGTACTTTGTGTAGTACAACGCGCAGTAC TTTGTGTAGTACAACGCG	
Lentivirus Anti-miR-590-3p sequence	ACTAGCTTACTGTAAAATTACGCGACTAG CTTACTGTAAAATTACGCGACTAGCTTAC TGTA AAAATTACGCGACTAGCTTACTGTAA AATTACGCGACTAGCTTACTGTAAAATTA CGCGACTAGCTTACTGTAAAATTACGCGA CTAGCTTACTGTAAAATTACGCGACTAGC TTACTGTAAAATTACGCG	