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| **Table S1. The siRNA sequences (Homo sapiens)** | |
| **siRNA** | **Sequence** |
| siKPNA2-1 | 5’-GCUGGUUUGAUUCCGAAAU-3’ |
| 3’- CGACCAAACUAAGGCUUUA-5’ |
| siKPNA2-2 | 5’- GUGGCUACUUACGUAAUCU-3’ |
| 3’- CACCGAUGAAUGCAUUAGA-5’ |
| siKPNA2-3 | 5’- GCUCCUGCAUCAUGAUGAU-3’ |
| 3’- CGAGGACGUAGUACUACUA-5’ |
| siGLI1-1 | 5’- GGCUCAGCUUGUGUGUAAU-3’ |
| 3’- CCGAGUCGAACACACAUUA-5’ |
| siGLI1-2 | 5’- GUCCUCGACUUGAACAUUA-3’ |
| 3’- CAGGAGCUGAACUUGUAAU-5’ |
| siGLI1-3 | 5’- CUGCACCAAACGCUAUACA-3’ |
| 3’- GACGUGGUUUGCGAUAUGU-5’ |
| siMYC-1 | 5’- GAGGAGACAUGGUGAACCA-3’ |
| 3’- CUCCUCUGUACCACUUGGU-5’ |
| siMYC-2 | 5’- GGGUCAAGUUGGACAGUGU-3’ |
| 3’- CCCAGUUCAACCUCUCACA-5’ |
| siMYC-3 | 5’- CGACGAGACCUUCAUCAAA-3’ |
| 3’- GCUGCUCUGGAAGUAGUUU-5’ |
| si-NC | 5’- GUGGCUACUUACGUAAUCU-3’ |
| 3’- CACCGAUGAAUGCAUUAGA-5’ |

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| **Table S2. The overexpressed plasmid of KPNA2 (Homo sapiens)** | |
| **Clone information** |  |
| Catalog No. | EX-A6366-M68 |
| ORF Length | 1590 bp |
| Plasmid Size | 7206 bp |
| Vector | pEZ-M68 |
| Description | Homo sapiens karyopherin subunit alpha 2 (KPNA2), transcript variant 2, mRNA |
| ORF sequence | ATGTCCACCAACGAGAATGCTAATACACCAGCTGCCCGTCTTCACAGATTCAAGAACAAGGGAAAAGACAGTACAGAAATGAGGCGTCGCAGAATAGAGGTCAATGTGGAGCTGAGGAAAGCTAAGAAGGATGACCAGATGCTGAAGAGGAGAAATGTAAGCTCATTTCCTGATGATGCTACTTCTCCGCTGCAGGAAAACCGCAACAACCAGGGCACTGTAAATTGGTCTGTTGATGACATTGTCAAAGGCATAAATAGCAGCAATGTGGAAAATCAGCTCCAAGCTACTCAAGCTGCCAGGAAACTACTTTCCAGAGAAAAACAGCCCCCCATAGACAACATAATCCGGGCTGGTTTGATTCCGAAATTTGTGTCCTTCTTGGGCAGAACTGATTGTAGTCCCATTCAGTTTGAATCTGCTTGGGCACTCACTAACATTGCTTCTGGGACATCAGAACAAACCAAGGCTGTGGTAGATGGAGGTGCCATCCCAGCATTCATTTCTCTGTTGGCATCTCCCCATGCTCACATCAGTGAACAAGCTGTCTGGGCTCTAGGAAACATTGCAGGTGATGGCTCAGTGTTCCGAGACTTGGTTATTAAGTACGGTGCAGTTGACCCACTGTTGGCTCTCCTTGCAGTTCCTGATATGTCATCTTTAGCATGTGGCTACTTACGTAATCTTACCTGGACACTTTCTAATCTTTGCCGCAACAAGAATCCTGCACCCCCGATAGATGCTGTTGAGCAGATTCTTCCTACCTTAGTTCGGCTCCTGCATCATGATGATCCAGAAGTATTAGCAGATACCTGCTGGGCTATTTCCTACCTTACTGATGGTCCAAATGAACGAATTGGCATGGTGGTGAAAACAGGAGTTGTGCCCCAACTTGTGAAGCTTCTAGGAGCTTCTGAATTGCCAATTGTGACTCCTGCCCTAAGAGCCATAGGGAATATTGTCACTGGTACAGATGAACAGACTCAGGTTGTGATTGATGCAGGAGCACTCGCCGTCTTTCCCAGCCTGCTCACCAACCCCAAAACTAACATTCAGAAGGAAGCTACGTGGACAATGTCAAACATCACAGCCGGCCGCCAGGACCAGATACAGCAAGTTGTGAATCATGGATTAGTCCCATTCCTTGTCAGTGTTCTCTCTAAGGCAGATTTTAAGACACAAAAGGAAGCTGTGTGGGCCGTGACCAACTATACCAGTGGTGGAACAGTTGAACAGATTGTGTACCTTGTTCACTGTGGCATAATAGAACCGTTGATGAACCTCTTAACTGCAAAAGATACCAAGATTATTCTGGTTATCCTGGATGCCATTTCAAATATCTTTCAGGCTGCTGAGAAACTAGGTGAAACTGAGAAACTTAGTATAATGATTGAAGAATGTGGAGGCTTAGACAAAATTGAAGCTCTACAAAACCATGAAAATGAGTCTGTGTATAAGGCTTCGTTAAGCTTAATTGAGAAGTATTTCTCTGTAGAGGAAGAGGAAGATCAAAACGTTGTACCAGAAACTACCTCTGAAGGCTACACTTTCCAAGTTCAGGATGGGGCTCCTGGGACCTTTAACTTTTAG |
| Vector Information for EX-A6366-M68 |  |

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| **Table S3. Lentiviral vector of shNC and shKPNA2 (Homo sapiens)** | | | |
| **Lentiviral vector information** | |  | |
| Target sequence 1  (Corresponding to siKPNA2-1 target sequence) | | | 5’- GCTGGTTTGATTCCGAAAT -3’ | |
| Target sequence 2  (Corresponding to siKPNA2-2 target sequence) | | | 5’- GTGGCTACTTACGTAATCT -3’ | |
| Lentiviral vector ­ | pLenti-U6-shRNA-CBh-3Xflag-Luc2-tCMV-mNeonGreen-F2A-Puro-WPRE | | | |
| Lentiviral vector of shNC | pLenti-U6-sh(NC)-CBh-3Xflag-Luc2-tCMV-mNeonGreen-F2A-Puro-WPRE | | | |
| Lentiviral vector of shKPNA2-1 | pLenti-U6-sh(KPNA2-1)-CBh-3Xflag-Luc2-tCMV-mNeonGreen-F2A-Puro-WPRE | | | |
| Lentiviral vector of shKPNA2-2 | pLenti-U6-sh(KPNA2-2)-CBh-3Xflag-Luc2-tCMV-mNeonGreen-F2A-Puro-WPRE | | | |

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| **Table S4. Primer sequences used for RT-qPCR (Homo sapiens)** | | |
| **Gene** | **Primers** | **5’----3’** |
| GAPDH | Forward | AGAAGGCTGGGGCTCATTTG |
| Reverse | AGGGGCCATCCACAGTCTTC |
| KPNA2 | Forward | CTGTGGCATAATAGAACCGTTG |
| Reverse | TTTCTCAGCAGCCTGAAAGATA |
| PCNA | Forward | TAATTTCCTGTGCAAAAGACGG |
| Reverse | AAGAAGTTCAGGTACCTCAGTG |
| CCND1 | Forward | GTCCTACTTCAAATGTGTGCAG |
| Reverse | GGGATGGTCTCCTTCATCTTAG |
| CDKN1A | Forward | GATGGAACTTCGACTTTGTCAC |
| Reverse | GTCCACATGGTCTTCCTCTG |
| BCL2 | Forward | GACTTCGCCGAGATGTCCAG |
| Reverse | GAACTCAAAGAAGGCCACAATC |
| BAX | Forward | CGAACTGGACAGTAACATGGAG |
| Reverse | CAGTTTGCTGGCAAAGTAGAAA |
| SNAI1 | Forward | CCTCGCTGCCAATGCTCATCTG |
| Reverse | AGCCTTTCCCACTGTCCTCATCTG |
| CDH1 | Forward | AGTCACTGACACCAACGATAAT |
| Reverse | ATCGTTGTTCACTGGATTTGTG |
| CDH2 | Forward | CGATAAGGATCAACCCCATACA |
| Reverse | TTCAAAGTCGATTGGTTTGACC |
| GLI1 | Forward | AACCCTTGGAAGGTGATATGTC |
| Reverse | TTCATACACAGATTCAGGCTCA |
| MYC | Forward | CGACGAGACCTTCATCAAAAAC |
| Reverse | CTTCTCTGAGACGAGCTTGG |
| POU5F1 | Forward | GTGGTCCGAGTGTGGTTCTGTAAC |
| Reverse | CCCAGCAGCCTCAAAATCCTCTC |
| SOX2 | Forward | CAGCATGTCCTACTCGCAGCAG |
| Reverse | CTGGAGTGGGAGGAAGAGGTAACC |

**Table S5. Antibody information**

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| **antibody name** | **Company** | **Primers** |
| anti-KPNA2 | Proteintech | 10819-1-AP |
| anti-c-Myc | Invitrogen | MA1-980 |
| anti-c-Myc | ABclonal | Ab134906 |
| anti-GLI1 | Abcom | A19032 |
| anti-BCL2 | Santa Cruz | sc-7382 |
| anti-BAX | CST | 5023 |
| anti-PCNA | Proteintech | 10205-2-AP |
| anti-P21 | Proteintech | 10355-1-AP |
| anti-Cyclin D1 | CST | 2978 |
| anti-N-Cadherin | Servicebio | GB111273 |
| anti-E-Cadherin | Proteintech | 20874-1-AP |
| anti-SNAI1 | Santa Cruz | sc-271977 |
| anti-OCT4 | Proteintech | 11263-1-AP |
| anti-SOX2 | Proteintech | 11064-1-AP |
| anti-Lamin B1 | Proteintech | 12987-1-AP |
| anti-GAPDH | Proteintech | 10494-1-AP |
| HRP-conjugated affinipure goat anti-Rabbit IgG | Proteintech | SA00001-2 |
| HRP-conjugated affinipure goat anti-Mouse IgG | Proteintech | SA00001-1 |
| TRITC- conjugated goat anti-Rabbit IgG | Proteintech | SA00007-2 |
| TRITC- conjugated goat anti- Mouse IgG | Proteintech | SA00007-1 |
| FITC-conjugated affinipure goat anti-Rabbit IgG | Proteintech | SA00003-2 |
| FITC-conjugated affinipure goat anti- Mouse IgG | Proteintech | SA00003-1 |

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| **Table S6. Primer sequences of promotors used for ChIP (Homo sapiens)** | | | |
| **Gene** | **Location** | **Primers** | **5’----3’** |
| GLI1 promoter | -1823…-1573 | Forward | AGGCCGTGTGACATGTGATT |
| Reverse | AATCGCTTGAACCTGGGAGG |
| GLI1 promoter | -1154…-856 | Forward | GAGGCCCCGTCCCAAATAAA |
| Reverse | TCCCACATCCTAGCTCTGCT |
| GLI1 promoter | -574…-371 | Forward | GTTCCCCAGCTCTTCTGCTT |
| Reverse | TGGTTCACGAGGTCACCAAG |
| KPNA2 promoter | -1967…-1830 | Forward | TGGTATGGTGGTCAGGCCTA |
| Reverse | CACCACCACGTCCAGCTAAT |
| KPNA2 promoter | -1520…-1282 | Forward | GAGGCTGCTTTCCTACCTCC |
| Reverse | ATGCCAGCCTCATTCATCGT |
| KPNA2 promoter | -1164…-921 | Forward | ATGGCCCAGAATCCTGATGC |
| Reverse | TCTGTTTCACGGTGTCTCTCC |