Supplementary Table 1. The sequences of all circRNA primers

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| **CircRNA ID** | **Right Primer** | **Left Primer** |
| hsa\_circ\_0086414 | TGAAAGAGATGCACGTCTGC | TTCTCCAAACCGCAGAAACT |
| hsa\_circ\_0003958 | TGGCCAAAGAAGTTGAGAAAA | TGGTGGGCAGCATTGTAATA |
| hsa\_circ\_0005962 | TGAAGCCATTGCTGAACTTG | GAAGCATTGGGGATCAAGAA |
| hsa\_circ\_0003998 | CAGGAGGTGGTGAAGGACAT | CGAACGAACTTTGGGGATAC |
| hsa\_circ\_0002346 | CCCGGACAGCTATGAAACTC | GCAGCCAGCAATAAGGTTTT |
| hsa\_circ\_0007836 | CTCATGACCGAGCAGTTCCT | TAGCTGCTTCACCTGCTCCT |
| hsa\_circ\_0001875 | TCGATTTAAGAGAGCAATTGGA | CAAGCCATGGAAACCATTCT |
| hsa\_circ\_0001900 | ACGTTCAGTGCCTCGAAAGA | TGTGCTCCTGCTCATACTGG |
| hsa\_circ\_0000247 | AGGGAGAGTGTTTTCCTGCTC | CTGGCATGGTACATGGAGAG |
| hsa\_circ\_0000043 | AGCAGCAACTGTGGGACTTT | CCCTCCTCCTTCAAATCTCC |
| hsa\_circ\_0001073 | AAGATGGCCTACCCTCCTGT | CGGTTCAACACCAGTTTGATT |
| hsa\_circ\_0001495 | CATGGTGCACTTTCCTCCTT | AACATGGCAGTGACACCAAC |
| hsa\_circ\_0006571 | CAAGGTGTCTCAAGCCCTGT | GCCAGCTGGTTCATATTTGG |
| hsa\_circ\_0001588 | ACATCCAGGGCATTACCAAG | CGACCAGACATGACCAACAC |
| hsa\_circ\_0025036 | GCCAACCGCTACTTGACATT | TGGTCCAGAAGGAGACCTTG |
| hsa\_circ\_0102537 | GCCCATGCCAAATAGTTACC | CCACCAACTCACCTTATTCCA |
| hsa\_circ\_0000326 | CAGCTTTATGCTGGAGTAACTGG | CCATAACTGATCTGACTTTGTATGTAA |
| hsa\_circ\_0001715 | GGGGTGCTCTACAAGGACAA | ACTACGCGGAGGGACTCAG |
| hsa\_circ\_0128333 | TGACAGCCTTCGAACCTGAG | TCCATTGCTTATGGCTTCAA |
| hsa\_circ\_0128332 | CTCTCGTTCCATGTCCTGCT | TCGCACATCTTCGTGTAGGA |
| hsa\_circ\_0020732 | TGGACCCCTCACCTACATTC | ACAGCCAGCAGGTTCTCCT |
| hsa\_circ\_0007766 | GTTTGAGTCCATGCCCAATC | GACCTGCCTCACTTGGTTGT |
| hsa\_circ\_0039411 | CAAGGCACTTTTCACGTGTC | ATTTGTTGCCCAGGAAAGTG |
| hsa\_circ\_0000519 | GCCCTAACAGGGCTCTCC | CAGACCTTCCCAAGGGACAT |
| hsa\_circ\_0003528 | GTAACCAGCAGCCTGGACTC | GCAACTTGCTGACCAGAACA |
| hsa\_circ\_0008274 | TGGGTGGAGTATGATGCTGA | CACCAGGTTTCACACCACAG |
| hsa\_circ\_0082564 | GGCAGCTTCTTTCAAGGCTA | CTTGCCCATCACCAAAGTCT |
| hsa\_circ\_0072088 | ATGGTCTGCAGTCCTGTGTG | TGGTGGCATGTTTTGTCATT |
| hsa\_circ\_0020850 | TAAAGATCGCCTGGCTCAGT | GGTTGTAGCCTGGCCAAAT |
| hsa\_circ\_0067512 | TGACCCCACCATTGAAGACT | TGTATGTGGGGAGGTTGTCA |
| hsa\_circ\_0006427 | ACAGCTACCGGATGAATGCT | AGGGCTTCAGCTGTTTCTCA |
| hsa\_circ\_0056616 | GTGGGTTGATTTCAGCACCT | TAACCGCTGGTTCTCCAGAT |
| hsa\_circ\_0007142 | CTGGAACTCTGCCTCAGGAT | CCTCGGTACCACCCTTCATA |
| hsa\_circ\_0001439 | GAACATGGAAGTGACTAACCAACA | GGGAAAGGCCTCCAATTTT |
| hsa\_circ\_0000690 | GCGAGCGAGTTTGTGAAAAT | AGCACTTTGGTGGCATCTG |
| hsa\_circ\_0001346 | TTTGTCCAGGATAGACATAGAGC | GAGCATCCCTATGGAGAGCA |
| hsa\_circ\_0001492 | TACCAGCATCCATTGCAAAC | ACCAACCGCACAAACAAACT |
| hsa\_circ\_0008193 | CTGGCTTCCTTTCACTGGAG | CAAGCCATGGAAACCATTCT |
| hsa\_circ\_0000729 | GCAAGTGAGCATGTGTGTGC | TTGCATGCCTCACCTTTACA |
| hsa\_circ\_0000211 | ATGGCCTCTGAATGGAAATG | CTCGAACCAGTCAAGTCACG |
| hsa\_circ\_0002360 | CCACTCCACTGCCTTTAACC | TGATTTTGATGGCTCTGTGG |
| hsa\_circ\_0007874 | GCCTGAACACACTGGGAAAT | CACAGATGCGAGAACACAGG |
| hsa\_circ\_0030998 | CAACACGTTACAGCGTCCAG | AATCACGAGACTGGGGTCAG |
| hsa\_circ\_0022812 | GTCACCCCAGATGTCCTCAT | GACAGCAATCAGGTCAAGCA |
| hsa\_circ\_0005927 | GCTTGGACAGCTGGGAGTAA | GCCATAGATGGTTGGTCCAG |
| hsa\_circ\_0001936 | AGTGACGCTTCGGTAGAGGA | GCAGCTCCCTGATTATTCCA |
| hsa\_circ\_0000064 | CTAGAGGCGGTGGCGTTG | CCACCCTGTCCTGACTCG |
| hsa\_circ\_0000190 | GAGGGCAGCTGAAGTCACAC | ACCAGTGCAATGACATGAGC |
| hsa\_circ\_0012673 | CCAACACATCTGCACTGCTT | TCATCAAGCTCAGGCAACAC |
| hsa\_circ\_0077837 | TGCCAAGGGACAAGTGTTATT | CCTTGGTTGCATCTGTTCCT |
| hsa\_circ\_0001821 | TTGGGTCTCCCTATGGAATG | CATCTTGAGGGGCATCTTTT |
| hsa\_circ\_0000284 | GGCAGCCTTACAGGGTTAAA | GGGTAGACCAAGACTTGTGAGG |
| hsa\_circ\_0046264 | CTCGACAAAGATGGGGTTGT | CTGATCTCGGAACCTTCTGC |
| hsa\_circ\_0007534 | CGGAAATCCAATTGCACCTA | CTGGCGAGTTGGTGAGTTTT |
| hsa\_circ\_0033155 | GGGGTCAGGAAAGAAACTGC | TGTCGTCTTCTTGCATCTGG |
| hsa\_circ\_0004350 | GGGTTAAATTCCTGTGGGAGT | GCTTTTTGCCAACCTCAAGA |
| hsa\_circ\_0092857 | AAGAACGAGAACGGCGTAGA | TCAAGCATTCGTGACATTCG |
| hsa\_circ\_0046264 | CTCGACAAAGATGGGGTTGT | CTGATCTCGGAACCTTCTGC |
| hsa\_circ\_0079530 | AAATAGATCCGGTGTCTAAATGC | TCCATTTTCTCCTTCTCTGGA |
| hsa\_circ\_001389 | GCAAGTGAGCATGTGTGTGC | TTGCATGCCTCACCTTTACA |
| hsa\_circ\_0016760 | CTCAGAAGCGCAAGAACCTC | TGGGCTCCAGGTAGTAGGTG |
| hsa\_circ\_0060937 | CTGCTGTCACAGAGCTCCAG | TTTTGATGGCCATGATGAAG |
| hsa\_circ\_0000159 | CAGAAGGAGTTGCAGGCTTT | CCAAGTTTTTGGCTTTGCTC |
| hsa\_circ\_0086720 | CAACAATCAGATGGCACCAG | AATCATGTAGGGCCACTATGC |
| hsa\_circ\_0020123 | GTATGCACTCTGGCCTGCTT | ACCCATCAGTTGACTGGACA |
| hsa\_circ\_0000376 | TTTGGATGTGGAGGGGAATA | GAGCCCAGGAGTTCCAGACT |
| hsa\_circ\_0000735 | GGCACTGCAGACCCATCTAT | AGGCCCTTGAGTTTCACAGA |
| hsa\_circ\_0072083 | AAACTACTTTTGCTTTGAAATGATG | GCTGTGGGTGAATCCAAAGTA |
| hsa\_circ\_0043278 | TGTTTGCATCTACCCTGCTG | CCAATTTCCAAAGCCACAGT |
| hsa\_circ\_0023404 | AATGGTCCTCATCCTCATCG | CCTCCATTGCTCTTCTGGAG |
| hsa\_circ\_0011292 | AAGGAGCTGATGGAGAATGG | ATAGTTGCCCTGGTTGATGG |
| hsa\_circ\_0020123  | GTATGCACTCTGGCCTGCTT | ACCCATCAGTTGACTGGACA |
| hsa\_circ\_0067934 | AAGGAACGATTGGGTTGTCA | GAGAACGTGGTATGCGAATTT |
| hsa\_circ\_0096157 | TGCTGGAGTAACTGGCATGT |  TAGACCCCTGACTTTCTGGA |
| hsa\_circ\_0007385 | GTTTGAACGCATGTCTCTGC | GCAGCACAAGACCCACAGTA |
| hsa\_circ\_0102231 | CCTGCTAAGGAGTGTGTTTTGG | TTCTGTGGAAGATCTGGAAGC |
| hsa\_circ\_0109320 | GCATCCTCTTATGTGTAGTAAGGTGT | GGCAAAGCCTTTAAAGAGTCC |
| hsa\_circ\_0085131 | GCAAGGAAACGTAATTTGGA | CGGACAGCAGGAGTAGCTG |
| hsa\_circ\_0000567 | AACACAGCTCGACAGTACGC | TCCTTTGGTGACACAGTTGC |
| hsa\_circ\_0006867 | TTACCTTGCCCACCAACTTC | TCTCCAGGGCTGTATTTTGC |
| hsa\_circ\_0087862 | GGGCTATGAACGAGAGCAAG | AGTTGTGGTGGTGGAGGAAG |
| hsa\_circ\_0072309 | TCCACACCGCTCAAATGTTA | ATCCAGGATGGTCGTTTCAA |
| hsa\_circ\_0106705 | ATGTTGGGGGTTGTGTGTG | ACCCTCTAGGCACCTCCACT |
| hsa\_circ\_0072083 | AAACTACTTTTGCTTTGAAATGATG | GCTGTGGGTGAATCCAAAGTA |
| hsa\_circ\_0001649 | AGGCAATGCTGAAAACTGCT | GCCACGTTGAGAAAACGAGT |
| hsa\_circ\_0005035  | AGCCGATGTGTGAGAAGACC | GATGAGCAGGATGTGGAGGT |
| hsa\_circ\_0013958 | TCAACCCACAGGAGGTCTTT | ATAGCTGGGGGTTCCACTCT |
| hsa\_circ\_0014130 | TGGTACATGACGGAGACACTG | AAAGTCCGAGGGTTCTGGTT |
| hsa\_circ\_0012384 | TCCATTCAGTGATGTTGGATG | TTCAAGGATGCCTTCAGGTT |
| hsa\_circ\_0074027 | CAGCGTCCCTGTGTATGTTG | CGGCAGAGTCTGTCTTAAAGC |
| hsa\_circ\_0002130 | CACCACGTGGGAGATTCTG | CAAGTCCTCAACGTTCCACA |
| hsa\_circ\_0031250 | TCCCCACTAGCATTTTCCTG | TCCTCCCCACTGTACTCCTC |
| hsa\_circ\_0000003  | CCATGCACAAGCTCTTTGAC | GGCTCTGAGGTCCTTGCTTA |
| hsa\_circ\_0023404 | AATGGTCCTCATCCTCATCG | CCTCCATTGCTCTTCTGGAG |
| hsa\_circ\_0007059 | CTGTCTCTAAGCCGGACCTG |  CTATGGCCACATCCCTGAAT |
| hsa\_circ\_0020123 | GTATGCACTCTGGCCTGCTT | ACCCATCAGTTGACTGGACA |
| hsa\_circ\_0004015 | TGGAAAAACTAGGGGAAGGA | GAATTGTGTCCAGGGGTTTG |
| hsa\_circ\_0078767 | GCCTAGCTGTCAAGGAGTGG | GGATCTAGAGATGCGCCAAC |
| hsa\_circ\_0001724 | GAGGCACCTGGAGACCTTC | CAATCAGACAGCCCAGAAGC |
| hsa\_circ\_0026134 | CACTCCTTTGTCTTGGAACTGTC | GGCAACAAGGATCTCCCACT |
| hsa\_circ\_0043278 | TGTTTGCATCTACCCTGCTG | CCAATTTCCAAAGCCACAGT |
| hsa\_circ\_0002483 | CGTTATTTGCCAAAAGGATTTC | TGTGATTCAAGTTGGGGTCA |
| hsa\_circ\_0076305 | CACCCTCCTAGGGCATTGTA | AGGAAGTTCTGGGGTGGAGT |
| hsa\_circ\_0001946 | CATGTCTTCCAACGTCTCCA | CTGGAAGACCCGGAGTTGT |
| hsa\_circ\_0003645 | ACCTGCATTCTGGTCAGGTG | GGCCAAAGGAAACCATTTTT |
| hsa\_circ\_0046263 | ACCATTTGGGATCACTTCCA | CTTCTTCAGCCAGTTCACGA |
| hsa\_circ\_0001727 | CCCAGTCCCACTTCAAACAT | TCAGGCTCCAGGAACTGACT |
| hsa\_circ\_0008305 | AGAAGGTGAACGGGCTTTG | TTTTGGCCTTGACAGAATCC |
| hsa\_circ\_0011385 | CTGGCCATGAGAGTGGAGAG | CTTGTCCGTGGAGAACATGA |
| hsa\_circ\_0008717 | CATTCCGTCAGGATCTGTCA | GGTGGCCAGATTAGGTGAGA |
| hsa\_circ\_0134501 | TGATGATCAATTAAAAGCTCTGC | GCTTTTAACCAAGTGTCAACTCTTAC |
| hsa\_circ\_0008975 | GGGACGGAGAGGTGTTCTTT | TGCTGCTTTTCGATACATGC |
| hsa\_circ\_0001421 | TGCCCAGAATGACAAGCATA | TGAGCAGATGTTCCTGTTGC |
| hsa\_circ\_0008133 | TTGCAGTCAGAGCCTGAAAGT | AGCTGCATAACTGTCTGTTGGA |
| hsa\_circ\_0000042 | GACCAGGCAAGCTAGTGCTC | CTGCTCGGTAACTGGGAAGT |
| hsa\_circ\_0001947 | CTTGGATGGAAAACCCAGTG | AGTTTCCAAGCGTGTTCTGG |
| hsa\_circ\_0047921 | GGCTTTACCGCTGCTACTTG | CTTTCCAGGTTCCGAAACAA |
| hsa\_circ\_0056285 | GGAGGAGGCCAGGAGTAAAG | CTGGCCCTTACTCTTGTTGG |
| hsa\_circ\_0007761 | TGAGGCTTCCAAACTTCCTG | CGCTCCGACATTCTTTCC |
| hsa\_circ\_0003459 | GGAGCAATAGCGCAGACAAT | CCCTTTCACCTGGAATGCTA |
| hsa\_circ\_0110498 | TCAGCAAGATGGAAAGAATGG | CACTTGCTGCAGTTTGTGGT |
| hsa\_circ\_0006404 | GGGGAACTTCACTGGTGCTA | TCTTGCCAGTTCCCTCATTC |
| hsa\_circ\_0027491 | GCTTCAGGAAGAGAAACCTTCA | CAATATGTTGTTGCTTCTCATCA |
| hsa\_circ\_0004050 | ACCGAACATGAACATCAGCA | AAACTTCGGTTGTCAGCTTCA |
| hsa\_circ\_0014235 | AAGAGGGCGACAAGTTCAAG | GAAGGTAGTGACCAGCACAGC |
| hsa\_circ\_0001869 | TTTAAGAAACAGTGGACCTCAAAA | ATCAATGGCGGAATAAGCAG |
| hsa\_circ\_0000079 | CATTTGAAGTGCTTTGCTGCT | TAGCCTGGAGCTGTTCAACC |
| hsa\_circ\_0017247 | AGGACCGCACACGTTTCTAT | AAGGAAGTATCTTGGCCTCCA |
| hsa\_circ\_0007580 | GTGCAAGGAACACATGATGG | TCACTCGGTCAAGGTTGTTG |
| hsa\_circ\_0000353 | TTTGTTGTGATGGTGGCTTG | GACGGATGAACTCCTGTCCT |
| hsa\_circ\_0043265 | TTTGGTCGTGATTGCTCTGT | ATCTCCTCAGGAAGGCCACT |
| hsa\_circ\_0018818 | AGTCTCAGTGGCACCGTTGT | GACCATGCTCCATTTCTGCT |
| hsa\_circ\_0011780 | CCTTTGTGATGGTTCTGCAA | GATCCAGGGAATGAGGGAGT |
| hsa\_circ\_0037515 | TTCAGCTTCATGGTCAGCAC | AAGAGCAGGGTCATGAAGGA |
| hsa\_circ\_0037516 | CTGCTGCTCAGCTTCACCTA | TCGGCATGGTACTCCATGAT |
| hsa\_circ\_0001313 | CTCTCTTGGACCCAGCTCAG | TCCATTTTCTTTGCAGTTCTTG |
| hsa\_circ\_0021205 | TGCACTTGTCTTTGACTTGTGTT | CCGGGACTTCATATTGCTTT |
| hsa\_circ\_0043256 | AGTGACGGTGGACTGCTCTT | TCGAAAGTCACCCCGAATAG |
| hsa\_circ\_0007534 | CGGAAATCCAATTGCACCTA | CTGGCGAGTTGGTGAGTTTT |
| hsa\_circ\_0062389 | TCTGAGAAGCTGCAGTCCAA | CTCCAGCACAAAATCATGGA |
| hsa\_circ\_0008003 | TGGGGCTAACAAACTTCACC | GTCCCACCAGAGGTTGTCAC |
| hsa\_circ\_0102533 | ATTGGCTTCCCAGCTTGATA | GCAGGCTGCAATACTGTGAA |
| hsa\_circ\_0018534 | TGCAAAGGAAGGTGGTTTCT | CCCTTTCACCTGGAATGCTA |
| hsa\_circ\_0010235 | CGTCTACCCGGATGACAAGT | CTGCGTGAAGGCTAAGACG |
| hsa\_circ\_0009150 | CATCCAGGCTCACCAGTACC | CAAATGTCACAGCGGTTGTC |
| hsa\_circ\_0002702 | CAACAGCCATACCCAGAGG | CGAATAAGGGCTTCAACAGC |
| hsa\_circ\_0049271 | AACTTCGCTGAGCAGATTGG | GCATGGGGTTCCAGAAGATA |
| hsa\_circ\_0053958 | GGTGCTGTGTGAGACAGAGG | GCAGCCAGCAATAAGGTTTT |
| hsa\_circ\_0074930 | GCACGTGCAGCAATAACATC | ATCTTCGGCATGTGGTTGA |
| hsa\_circ\_0049657 | AGCCCTGTTGATGACGTGTT | GTTTGATGTCCGCATCTCCT |
| hsa\_circ\_0015278 | AACCAACCAGTGGTCTCCAG | GCCACCATTCTCCATTCATT |
| hsa\_circ\_0003028 | GTCCAAGATTCTGGCAAAGC | TCAAAGAGATCCTCCTGGTGA |
| hsa\_circ\_0001287 | CCAGCAAATCTCCAGTGGTT | TGGCAAACTGTTCTTTAGCTTTT |
| hsa\_circ\_0001320 | CAGTGTGCGAAGATTTCCAA | CTGAGGGCTCAGCACTTGTT |
| hsa\_circ\_0000429 | AGGATCTTGAGTTGGGATGC | AGGTGCTGCAATTATGACCA |
| hsa\_circ\_0058357 | GGGCTGAAGTCGCCTCTG | GCAGCTGACCAGGAAGGTAG |
| hsa\_circ\_0002874 | AAAGCAGCAGGAGTTTGGAA | GAAAAACCTGTGGCCAAGAC |
| hsa\_circ\_0017956 | CTTTCTGACCAGCAACGACA | TGGAGGCAGATTTTCCAAAC |
| hsa\_circ\_0018414 | TCAAATGATCATGGCAGAATG | GTTCGGCTGCAGAGTCAGG |
| hsa\_circ\_0027446 | AAGAAAGCAGAAGCCACTGGA | ACTCTTGTTTTTGCTGCCTTTG |
| hsa\_circ\_0008928 | TGTGTCCCAAGCTGTCTTTG | ACAAACTCGGCGTGTTCTTC |
| hsa\_circ\_001806 | CCATCCCATCAGTTCATCCT | TTCACCTCCAAAGAGCATCC |
| hsa\_circ\_0001944 | ATGGGAAGACTTGGTTGTGC |  CAGCTTCTTGGAAGGCTGAG  |