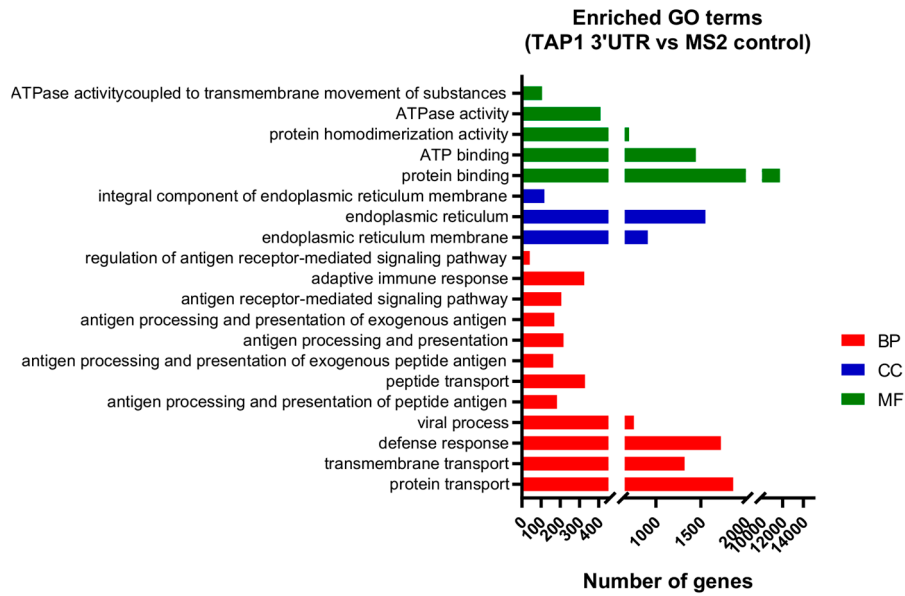
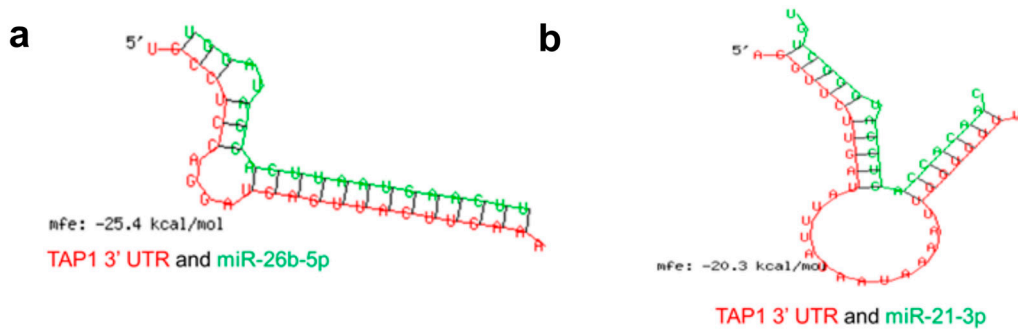


**Figure S1.** Sequence length distribution of miTRAP eluates.



**Figure S2.** The GO terms of candidate targets of miRs enriched in the TAP1 3' UTR miTRAP eluates vs the MS2 control.



**Figure S3.** RNAhybrid figures.

**Table S1.** List of primers.

| <b>Name</b>                      | <b>Sequence</b>  |
|----------------------------------|--|
| TAP1 2MS2 fwd                    | AAAGAATTCCTCCAGAATGAAAGCCTT CTC                        |
| TAP1 2MS2 rev                    | AAACTCGAGACAAAACACCAATTTTATTA                          |
| TAP1 3'UTR LUC fwd               | AAAGCTAGCCTCCAGAATGAAAGCCTTCTC                         |
| TAP1 3'UTR LUC rev               | AAAGTCGACACAAAACACCAATTTTATTA                          |
| del TAP1 3'UTR miR-26b-5p<br>fwd | TTGTCCTTGAGTGTGTTACCTC                                 |
| del TAP1 3'UTR miR-26b-5p<br>rev | GCTGCCTACTCTGCAGCT                                     |
| del TAP1 3'UTR miR-21-3p<br>fwd  | GTGTCGACCTGCAGGCAT                                     |
| del TAP1 3'UTR miR-21-3p<br>rev  | ACAGGGTGTTTATGGGCC                                     |
| SLRT miR-26b-5p                  | GTCGTATCCAGTGCAGGGTCCGAGGTATTCGCACTGGATACGACAC<br>CTAT |
| miR-26b-5p fwd                   | GCCCCGTTCAAGTAATTCAGG                                  |
| SLRT miR-21-3p                   | GTCGTATCCAGTGCAGGGTCCGAGGTATTCGCACTGGATACGACAC<br>AGCC |
| miR-21-3p fwd                    | GCCCAACACCAGTCGATGG                                    |
| general miR reverse primer       | GTGCAGGGTCCGAGGT                                       |
| RNU6A qPCR fwd                   | CGGCAGCACATATACTAAAATTGGA                              |
| RNU6A qPCR rev                   | AATATGGAACGCTTCACGAATTTGC                              |
| TAP1 qPCR fwd                    | GGAATCTCTGGCAAAGTCCA                                   |
| TAP1 qPCR rev                    | TGGGTGAACTGCATCTGGTA                                   |
| TAP2 qPCR fwd                    | CCAAGACGTCTCCTTTGCAT                                   |
| TAP2 qPCR rev                    | TTCATCCAGCAGCACCTGTC                                   |
| HLA-ABC fwd                      | GCCTACCACGGCAAGGATTAC                                  |
| HLA-ABC rev                      | GGTGGCCTCATGGTCAGAGA                                   |
| GAPDH fwd                        | GAGAAGGCTGGGGCTCATTG                                   |
| GAPDH rev                        | GGACTGTGGTCATGAGTCCTTC                                 |
| ACTB fwd                         | TCCTGTGGCATCCACGAAACT                                  |
| ACTB rev                         | GAAGCATTGCGGTGGACGAT                                   |

**Table S2.** List of the enriched miRs in TAP1 3' UTR miTRAP eluates.

| miR               | TAP1 3'UTR<br>Biol. Repl. 1<br>(tpm) | MS2 control<br>Biol. Repl. 1<br>(tpm) | TAP1 3'UTR<br>Biol. Repl. 2<br>(tpm) | MS2 control<br>Biol. Repl. 2<br>(tpm) | Average<br>enrichment<br>ratio |
|-------------------|--------------------------------------|---------------------------------------|--------------------------------------|---------------------------------------|--------------------------------|
| hsa-let-7a-5p     | 33050.40                             | 5232.11                               | 43199.70                             | 5495.93                               | 7.09                           |
| hsa-let-7b-3p     | 2.40                                 | 0.32                                  | 3.77                                 | 0.86                                  | 5.97                           |
| hsa-let-7b-5p     | 1393.96                              | 1908.77                               | 1829.08                              | 2883.87                               | 0.68                           |
| hsa-let-7c-5p     | 243.54                               | 45.76                                 | 609.15                               | 75.94                                 | 6.67                           |
| hsa-let-7d-3p     | 120.97                               | 27.01                                 | 135.31                               | 153.60                                | 2.68                           |
| hsa-let-7d-5p     | 906.07                               | 315.59                                | 2049.02                              | 435.77                                | 3.79                           |
| hsa-let-7e-5p     | 282.80                               | 314.63                                | 352.55                               | 331.36                                | 0.98                           |
| hsa-let-7f-1-3p   | 0.80                                 | 0.95                                  | 1.62                                 | 0.00                                  | 0.84                           |
| hsa-let-7f-2-3p   | 0.80                                 | 0.64                                  | 0.00                                 | 0.00                                  | 1.26                           |
| hsa-let-7f-5p     | 56416.01                             | 2169.06                               | 65537.27                             | 1922.58                               | 30.05                          |
| hsa-let-7g-5p     | 17767.35                             | 403.94                                | 27442.59                             | 749.88                                | 40.29                          |
| hsa-let-7i-3p     | 206.69                               | 0.32                                  | 123.99                               | 0.00                                  | 650.36                         |
| hsa-let-7i-5p     | 61665.78                             | 2135.37                               | 62125.48                             | 4393.98                               | 21.51                          |
| hsa-miR-100-5p    | 2479.48                              | 4404.85                               | 1073.83                              | 8869.94                               | 0.34                           |
| hsa-miR-101-3p    | 10793.55                             | 225.96                                | 19595.31                             | 478.92                                | 44.34                          |
| hsa-miR-103a-3p   | 1788.91                              | 48.94                                 | 1465.74                              | 169.13                                | 22.61                          |
| hsa-miR-103b      | 1275.39                              | 46.08                                 | 1122.35                              | 164.82                                | 17.24                          |
| hsa-miR-105-5p    | 7.21                                 | 15.89                                 | 7.01                                 | 56.95                                 | 0.29                           |
| hsa-miR-106a-5p   | 3.20                                 | 0.64                                  | 0.54                                 | 0.86                                  | 2.83                           |
| hsa-miR-106b-3p   | 54.48                                | 122.36                                | 72.77                                | 428.01                                | 0.31                           |
| hsa-miR-106b-5p   | 5.61                                 | 17.48                                 | 11.32                                | 57.82                                 | 0.26                           |
| hsa-miR-107       | 32.04                                | 1.59                                  | 39.89                                | 10.36                                 | 12.01                          |
| hsa-miR-10a-3p    | 15.22                                | 1.91                                  | 8.63                                 | 15.53                                 | 4.27                           |
| hsa-miR-10a-5p    | 704.19                               | 363.89                                | 270.08                               | 911.24                                | 1.12                           |
| hsa-miR-10b-5p    | 66.49                                | 9.85                                  | 8.09                                 | 296.84                                | 3.39                           |
| hsa-miR-1180-3p   | 365.31                               | 10.17                                 | 489.48                               | 40.56                                 | 23.99                          |
| hsa-miR-122-5p    | 11.22                                | 2.22                                  | 52.29                                | 94.06                                 | 2.80                           |
| hsa-miR-1246      | 7.21                                 | 0.95                                  | 21.56                                | 13.81                                 | 4.56                           |
| hsa-miR-1248      | 5.61                                 | 4.13                                  | 1.08                                 | 31.07                                 | 0.70                           |
| hsa-miR-1254      | 0.80                                 | 3.18                                  | 1.62                                 | 9.49                                  | 0.21                           |
| hsa-miR-125a-3p   | 1.60                                 | 7.95                                  | 1.08                                 | 16.40                                 | 0.13                           |
| hsa-miR-125a-5p   | 273.18                               | 32.73                                 | 159.03                               | 132.03                                | 4.77                           |
| hsa-miR-125b-1-3p | 58.48                                | 113.46                                | 8.63                                 | 75.07                                 | 0.32                           |
| hsa-miR-125b-5p   | 222.71                               | 89.94                                 | 111.05                               | 188.12                                | 1.53                           |
| hsa-miR-1262      | 1.60                                 | 1.91                                  | 3.23                                 | 11.22                                 | 0.56                           |
| hsa-miR-126-3p    | 137.79                               | 56.57                                 | 40.97                                | 77.66                                 | 1.48                           |
| hsa-miR-126-5p    | 7.21                                 | 1.27                                  | 2.16                                 | 0.00                                  | 5.67                           |
| hsa-miR-1268a     | 6.41                                 | 13.35                                 | 9.16                                 | 48.32                                 | 0.33                           |
| hsa-miR-1269a     | 0.80                                 | 0.64                                  | 0.00                                 | 0.00                                  | 1.26                           |
| hsa-miR-1269b     | 1.60                                 | 8.58                                  | 9.16                                 | 34.52                                 | 0.23                           |
| hsa-miR-1273f     | 1.08                                 | 0.80                                  | 1.08                                 | 0.80                                  | 1.35                           |
| hsa-miR-1273g-3p  | 3.20                                 | 3.18                                  | 4.31                                 | 4.31                                  | 1.00                           |
| hsa-miR-127-3p    | 0.80                                 | 1.59                                  | 0.00                                 | 0.00                                  | 0.50                           |
| hsa-miR-1283      | 72.90                                | 31.15                                 | 26.41                                | 25.89                                 | 1.68                           |
| hsa-miR-128-3p    | 198.68                               | 29.24                                 | 212.39                               | 133.75                                | 4.19                           |
| hsa-miR-1287-5p   | 34.45                                | 1264.57                               | 28.57                                | 2159.02                               | 0.02                           |
| hsa-miR-1293      | 1.60                                 | 0.32                                  | 1.62                                 | 5.18                                  | 2.68                           |
| hsa-miR-129-5p    | 5.61                                 | 2.86                                  | 0.54                                 | 8.63                                  | 1.01                           |
| hsa-miR-1296-5p   | 1.60                                 | 11.76                                 | 0.00                                 | 19.85                                 | 0.07                           |
| hsa-miR-1299      | 31.24                                | 0.32                                  | 51.75                                | 2.59                                  | 59.15                          |
| hsa-miR-1301-3p   | 149.81                               | 9.53                                  | 168.19                               | 63.86                                 | 9.17                           |
| hsa-miR-1303      | 1.60                                 | 0.95                                  | 7.01                                 | 15.53                                 | 1.07                           |
| hsa-miR-1307-3p   | 40.06                                | 110.60                                | 81.40                                | 563.49                                | 0.25                           |
| hsa-miR-130a-3p   | 24.03                                | 1.27                                  | 4.85                                 | 1.73                                  | 10.86                          |

|                   |          |         |           |          |       |
|-------------------|----------|---------|-----------|----------|-------|
| hsa-miR-130b-3p   | 19.23    | 0.64    | 17.79     | 0.86     | 25.43 |
| hsa-miR-130b-5p   | 81.71    | 5.40    | 59.30     | 20.71    | 8.99  |
| hsa-miR-1323      | 277.99   | 171.94  | 323.98    | 247.66   | 1.46  |
| hsa-miR-132-5p    | 1.60     | 6.36    | 0.54      | 31.93    | 0.13  |
| hsa-miR-1343-3p   | 0.80     | 0.95    | 2.70      | 0.86     | 1.98  |
| hsa-miR-135b-3p   | 6.41     | 1.91    | 1.08      | 24.16    | 1.70  |
| hsa-miR-135b-5p   | 390.15   | 8.58    | 636.11    | 28.48    | 33.90 |
| hsa-miR-138-1-3p  | 0.80     | 0.95    | 0.00      | 2.59     | 0.42  |
| hsa-miR-138-5p    | 8.01     | 6.99    | 7.55      | 32.79    | 0.69  |
| hsa-miR-139-3p    | 6.41     | 0.32    | 5.93      | 0.00     | 20.17 |
| hsa-miR-139-5p    | 20.83    | 3.81    | 1.08      | 7.77     | 2.80  |
| hsa-miR-1-3p      | 116.96   | 74.37   | 29.11     | 60.40    | 1.03  |
| hsa-miR-140-3p    | 682.56   | 506.59  | 494.87    | 374.51   | 1.33  |
| hsa-miR-140-5p    | 83.32    | 721.11  | 23.72     | 975.96   | 0.07  |
| hsa-miR-143-3p    | 1093.54  | 44.18   | 19.41     | 37.11    | 12.64 |
| hsa-miR-143-5p    | 13.62    | 0.64    | 0.54      | 0.00     | 21.43 |
| hsa-miR-145-3p    | 19.23    | 0.64    | 0.00      | 0.86     | 15.12 |
| hsa-miR-145-5p    | 129.78   | 3.50    | 0.54      | 2.59     | 18.67 |
| hsa-miR-146a-3p   | 4.81     | 12.08   | 2.16      | 21.57    | 0.25  |
| hsa-miR-146a-5p   | 76427.30 | 6196.03 | 111664.14 | 16426.52 | 9.57  |
| hsa-miR-146b-5p   | 268.38   | 12.08   | 234.50    | 64.72    | 12.92 |
| hsa-miR-148a-3p   | 3261.38  | 150.96  | 81.40     | 1851.82  | 10.82 |
| hsa-miR-148b-3p   | 1971.57  | 33.37   | 2948.73   | 113.04   | 42.58 |
| hsa-miR-148b-5p   | 35.25    | 1.59    | 14.02     | 6.04     | 12.25 |
| hsa-miR-149-5p    | 2.40     | 0.64    | 22.10     | 2.59     | 6.16  |
| hsa-miR-151a-3p   | 178.65   | 215.79  | 177.36    | 801.65   | 0.52  |
| hsa-miR-151a-5p   | 141.00   | 5.08    | 117.52    | 11.22    | 19.10 |
| hsa-miR-151b      | 1.60     | 0.32    | 6.47      | 0.86     | 6.27  |
| hsa-miR-152-3p    | 87.32    | 3.81    | 50.13     | 12.94    | 13.39 |
| hsa-miR-155-5p    | 10.41    | 16.53   | 21.02     | 47.46    | 0.54  |
| hsa-miR-15b-3p    | 2.40     | 1.59    | 4.31      | 12.94    | 0.92  |
| hsa-miR-15b-5p    | 12.82    | 1.91    | 2.16      | 1.73     | 3.99  |
| hsa-miR-16-1-3p   | 1.60     | 0.32    | 0.54      | 15.53    | 2.54  |
| hsa-miR-16-2-3p   | 88.12    | 6.67    | 103.50    | 43.15    | 7.80  |
| hsa-miR-16-5p     | 20.03    | 35.59   | 19.95     | 22.44    | 0.73  |
| hsa-miR-17-3p     | 3.20     | 0.32    | 2.16      | 0.00     | 10.08 |
| hsa-miR-17-5p     | 209.89   | 28.60   | 127.22    | 69.90    | 4.58  |
| hsa-miR-181a-2-3p | 20.83    | 40.68   | 11.86     | 93.20    | 0.32  |
| hsa-miR-181a-3p   | 15.22    | 13.98   | 8.09      | 20.71    | 0.74  |
| hsa-miR-181a-5p   | 786.70   | 38.46   | 1341.75   | 195.88   | 13.65 |
| hsa-miR-181b-5p   | 1423.60  | 31.78   | 2030.15   | 227.81   | 26.85 |
| hsa-miR-182-5p    | 8024.87  | 147.78  | 2142.82   | 186.39   | 32.90 |
| hsa-miR-183-5p    | 20.03    | 32.73   | 12.94     | 100.96   | 0.37  |
| hsa-miR-184       | 1.60     | 0.32    | 0.00      | 6.04     | 2.52  |
| hsa-miR-185-3p    | 51.27    | 2.86    | 121.29    | 7.77     | 16.77 |
| hsa-miR-185-5p    | 116.16   | 23.52   | 315.90    | 88.02    | 4.26  |
| hsa-miR-186-5p    | 55.28    | 152.87  | 32.34     | 1029.46  | 0.20  |
| hsa-miR-18a-3p    | 1.60     | 0.32    | 1.62      | 2.59     | 2.83  |
| hsa-miR-191-5p    | 306.03   | 217.70  | 145.55    | 978.55   | 0.78  |
| hsa-miR-192-5p    | 2.40     | 6.67    | 0.54      | 46.60    | 0.19  |
| hsa-miR-193a-5p   | 17614.33 | 4903.50 | 10624.59  | 4230.89  | 3.05  |
| hsa-miR-193b-3p   | 1.60     | 1.59    | 3.23      | 7.77     | 0.71  |
| hsa-miR-193b-5p   | 16.02    | 9.53    | 9.16      | 32.79    | 0.98  |
| hsa-miR-194-5p    | 0.80     | 0.95    | 3.77      | 11.22    | 0.59  |
| hsa-miR-195-3p    | 5.61     | 0.95    | 4.85      | 6.90     | 3.29  |
| hsa-miR-196a-5p   | 83.32    | 178.93  | 86.25     | 310.65   | 0.37  |
| hsa-miR-197-3p    | 10.41    | 3.18    | 10.24     | 12.08    | 2.06  |
| hsa-miR-199a-3p   | 74.50    | 6.99    | 35.04     | 13.81    | 6.60  |

|                  |           |         |           |          |         |
|------------------|-----------|---------|-----------|----------|---------|
| hsa-miR-199a-5p  | 19.23     | 1.59    | 2.16      | 5.18     | 6.26    |
| hsa-miR-19a-3p   | 4.81      | 9.85    | 3.23      | 20.71    | 0.32    |
| hsa-miR-19b-3p   | 1.60      | 17.48   | 4.85      | 39.69    | 0.11    |
| hsa-miR-200a-3p  | 527.14    | 11.44   | 1.62      | 2.59     | 23.35   |
| hsa-miR-200b-3p  | 115.36    | 4.13    | 1.62      | 5.18     | 14.12   |
| hsa-miR-203a-3p  | 9.61      | 14.62   | 12.94     | 26.75    | 0.57    |
| hsa-miR-203b-5p  | 9.61      | 14.62   | 12.94     | 26.75    | 0.57    |
| hsa-miR-204-3p   | 9.61      | 20.02   | 9.16      | 25.89    | 0.42    |
| hsa-miR-204-5p   | 84.12     | 20.98   | 60.38     | 74.21    | 2.41    |
| hsa-miR-206      | 3.20      | 1.59    | 0.54      | 3.45     | 1.09    |
| hsa-miR-20a-5p   | 263.57    | 56.57   | 155.25    | 184.66   | 2.75    |
| hsa-miR-210-3p   | 1169.64   | 43.86   | 452.82    | 150.15   | 14.84   |
| hsa-miR-2110     | 2.40      | 5.40    | 0.54      | 9.49     | 0.25    |
| hsa-miR-21-3p    | 9884.28   | 6.04    | 3003.72   | 6.90     | 1036.01 |
| hsa-miR-21-5p    | 80047.59  | 8474.41 | 41019.15  | 24493.94 | 5.56    |
| hsa-miR-218-5p   | 23.23     | 3.81    | 0.00      | 12.94    | 3.05    |
| hsa-miR-219b-5p  | 0.80      | 1.27    | 0.54      | 0.00     | 0.63    |
| hsa-miR-221-3p   | 459.85    | 505.32  | 184.36    | 893.98   | 0.56    |
| hsa-miR-221-5p   | 1254.56   | 51.17   | 921.28    | 110.45   | 16.43   |
| hsa-miR-222-3p   | 554.38    | 384.87  | 354.17    | 780.94   | 0.95    |
| hsa-miR-222-5p   | 4.01      | 2.54    | 0.00      | 3.45     | 0.79    |
| hsa-miR-22-3p    | 4805.95   | 34.96   | 8198.22   | 119.95   | 102.91  |
| hsa-miR-22-5p    | 1.60      | 3.81    | 1.08      | 19.85    | 0.24    |
| hsa-miR-23a-3p   | 39.26     | 80.72   | 31.81     | 79.39    | 0.44    |
| hsa-miR-23b-3p   | 36.85     | 15.89   | 29.11     | 17.26    | 2.00    |
| hsa-miR-23b-5p   | 3.20      | 7.63    | 3.23      | 28.48    | 0.27    |
| hsa-miR-24-1-5p  | 8.01      | 0.95    | 4.31      | 2.59     | 5.03    |
| hsa-miR-24-2-5p  | 180.25    | 6.04    | 84.63     | 18.98    | 17.15   |
| hsa-miR-24-3p    | 1211.30   | 281.26  | 1658.73   | 557.45   | 3.64    |
| hsa-miR-25-3p    | 489.49    | 234.54  | 341.77    | 700.69   | 1.29    |
| hsa-miR-25-5p    | 34.45     | 20.02   | 49.59     | 83.70    | 1.16    |
| hsa-miR-26a-5p   | 138317.40 | 1420.29 | 168232.85 | 3316.20  | 74.06   |
| hsa-miR-26b-3p   | 0.80      | 2.54    | 2.16      | 0.86     | 1.41    |
| hsa-miR-26b-5p   | 5482.10   | 45.45   | 5433.86   | 85.43    | 92.12   |
| hsa-miR-27a-3p   | 200.28    | 161.45  | 177.36    | 911.24   | 0.72    |
| hsa-miR-27a-5p   | 90.53     | 54.35   | 35.04     | 189.84   | 0.93    |
| hsa-miR-27b-3p   | 8253.99   | 751.62  | 3533.62   | 734.34   | 7.90    |
| hsa-miR-27b-5p   | 8.01      | 28.29   | 8.09      | 108.73   | 0.18    |
| hsa-miR-28-3p    | 385.34    | 1254.08 | 384.90    | 1564.47  | 0.28    |
| hsa-miR-28-5p    | 128.98    | 5.72    | 234.50    | 24.16    | 16.13   |
| hsa-miR-29a-3p   | 1282.60   | 240.26  | 422.09    | 529.83   | 3.07    |
| hsa-miR-29b-1-5p | 11.22     | 3.18    | 6.47      | 11.22    | 2.05    |
| hsa-miR-29b-3p   | 123.37    | 4.13    | 10.24     | 2.59     | 16.91   |
| hsa-miR-29c-3p   | 1.60      | 0.32    | 1.08      | 2.59     | 2.73    |
| hsa-miR-301b-3p  | 3.20      | 0.64    | 1.08      | 0.86     | 3.15    |
| hsa-miR-3074-5p  | 1103.15   | 278.40  | 1547.68   | 540.19   | 3.41    |
| hsa-miR-30a-3p   | 48.87     | 66.74   | 29.11     | 81.11    | 0.55    |
| hsa-miR-30a-5p   | 859.61    | 1514.05 | 271.69    | 1852.69  | 0.36    |
| hsa-miR-30b-3p   | 8.81      | 8.90    | 13.48     | 28.48    | 0.73    |
| hsa-miR-30b-5p   | 36.85     | 23.84   | 14.02     | 11.22    | 1.40    |
| hsa-miR-30c-1-3p | 0.80      | 2.54    | 1.62      | 0.00     | 0.32    |
| hsa-miR-30c-2-3p | 17.62     | 11.76   | 29.65     | 44.01    | 1.09    |
| hsa-miR-30c-5p   | 399.76    | 552.04  | 127.22    | 1044.99  | 0.42    |
| hsa-miR-30d-3p   | 13.62     | 10.81   | 10.78     | 15.53    | 0.98    |
| hsa-miR-30d-5p   | 1854.60   | 1890.65 | 913.19    | 6161.24  | 0.56    |
| hsa-miR-30e-3p   | 63.29     | 25.74   | 38.81     | 90.61    | 1.44    |
| hsa-miR-30e-5p   | 151.41    | 160.18  | 63.61     | 440.95   | 0.54    |
| hsa-miR-3158-3p  | 28.04     | 0.64    | 38.27     | 0.86     | 44.23   |

|                  |           |           |           |           |         |
|------------------|-----------|-----------|-----------|-----------|---------|
| hsa-miR-3158-5p  | 24.03     | 0.64      | 34.50     | 0.86      | 38.90   |
| hsa-miR-3180-3p  | 0.80      | 3.18      | 0.54      | 111.32    | 0.13    |
| hsa-miR-3184-3p  | 668.94    | 3388.49   | 866.83    | 9410.99   | 0.14    |
| hsa-miR-3184-5p  | 107347.52 | 367393.92 | 100236.87 | 379634.09 | 0.28    |
| hsa-miR-3189-3p  | 0.80      | 1.91      | 1.62      | 3.45      | 0.44    |
| hsa-miR-3200-3p  | 1.60      | 0.95      | 0.00      | 0.00      | 1.68    |
| hsa-miR-320a     | 4228.34   | 314.95    | 3681.33   | 974.23    | 8.60    |
| hsa-miR-320b     | 213.90    | 36.87     | 369.27    | 149.28    | 4.14    |
| hsa-miR-320c     | 72.10     | 16.21     | 133.69    | 47.46     | 3.63    |
| hsa-miR-320d     | 12.02     | 5.08      | 14.02     | 8.63      | 1.99    |
| hsa-miR-324-5p   | 0.80      | 0.64      | 0.00      | 2.59      | 0.63    |
| hsa-miR-32-5p    | 10.41     | 3.18      | 3.23      | 9.49      | 1.81    |
| hsa-miR-328-3p   | 32.04     | 0.95      | 9.16      | 2.59      | 18.58   |
| hsa-miR-330-3p   | 140.20    | 3.50      | 46.90     | 14.67     | 21.65   |
| hsa-miR-331-5p   | 0.80      | 1.27      | 0.00      | 0.00      | 0.63    |
| hsa-miR-339-3p   | 24.03     | 105.83    | 10.24     | 120.81    | 0.16    |
| hsa-miR-339-5p   | 14.42     | 0.64      | 7.55      | 21.57     | 11.52   |
| hsa-miR-33b-3p   | 0.80      | 0.64      | 1.08      | 5.18      | 0.73    |
| hsa-miR-340-3p   | 6.41      | 7.95      | 4.31      | 19.85     | 0.51    |
| hsa-miR-340-5p   | 103459.66 | 26.38     | 94496.28  | 76.80     | 2576.29 |
| hsa-miR-342-5p   | 58.48     | 5.08      | 40.43     | 13.81     | 7.21    |
| hsa-miR-345-5p   | 4.01      | 0.95      | 0.54      | 13.81     | 2.12    |
| hsa-miR-34a-5p   | 8.81      | 0.64      | 8.63      | 2.59      | 8.60    |
| hsa-miR-34c-5p   | 378.13    | 12.39     | 7.01      | 2.59      | 16.61   |
| hsa-miR-3529-3p  | 1071.10   | 73.73     | 8276.93   | 1391.89   | 10.24   |
| hsa-miR-3591-3p  | 11.22     | 2.22      | 52.29     | 94.06     | 2.80    |
| hsa-miR-3605-5p  | 0.80      | 1.27      | 0.54      | 3.45      | 0.39    |
| hsa-miR-3607-3p  | 0.80      | 1.27      | 0.54      | 6.04      | 0.36    |
| hsa-miR-3609     | 0.80      | 0.95      | 1.08      | 0.86      | 1.04    |
| hsa-miR-361-3p   | 12.82     | 42.90     | 10.78     | 97.51     | 0.20    |
| hsa-miR-3615     | 3.20      | 3.18      | 2.16      | 13.81     | 0.58    |
| hsa-miR-361-5p   | 37.65     | 17.16     | 71.70     | 9.49      | 4.87    |
| hsa-miR-362-5p   | 7.21      | 4.77      | 7.01      | 19.85     | 0.93    |
| hsa-miR-3653-3p  | 0.80      | 0.64      | 0.00      | 0.00      | 1.26    |
| hsa-miR-365a-3p  | 15.22     | 8.26      | 20.48     | 31.07     | 1.25    |
| hsa-miR-365a-5p  | 4.01      | 2.86      | 3.23      | 18.12     | 0.79    |
| hsa-miR-365b-5p  | 4.01      | 2.54      | 5.39      | 27.61     | 0.89    |
| hsa-miR-3681-5p  | 6.41      | 50.21     | 0.54      | 3.45      | 0.14    |
| hsa-miR-3687     | 5.61      | 6.99      | 0.54      | 3.45      | 0.48    |
| hsa-miR-3688-3p  | 1.60      | 0.32      | 1.62      | 0.00      | 5.04    |
| hsa-miR-3689a-5p | 0.80      | 5.72      | 1.08      | 16.40     | 0.10    |
| hsa-miR-3691-5p  | 4.01      | 34.96     | 6.47      | 88.02     | 0.09    |
| hsa-miR-374a-3p  | 12.82     | 0.32      | 14.55     | 5.18      | 21.57   |
| hsa-miR-374a-5p  | 679.35    | 2.54      | 395.14    | 11.22     | 151.21  |
| hsa-miR-374b-3p  | 12.02     | 1.91      | 25.88     | 20.71     | 3.78    |
| hsa-miR-374b-5p  | 586.42    | 6.99      | 424.25    | 12.08     | 59.50   |
| hsa-miR-374c-3p  | 586.42    | 6.99      | 424.25    | 12.08     | 59.50   |
| hsa-miR-378a-3p  | 5701.61   | 1079.28   | 6194.49   | 4860.82   | 3.28    |
| hsa-miR-378a-5p  | 15.22     | 3.50      | 8.63      | 7.77      | 2.73    |
| hsa-miR-378c     | 85.72     | 32.42     | 258.76    | 195.88    | 1.98    |
| hsa-miR-378d     | 18.43     | 10.81     | 85.71     | 69.03     | 1.47    |
| hsa-miR-423-3p   | 108658.96 | 368044.80 | 101686.98 | 381420.33 | 0.28    |
| hsa-miR-423-5p   | 668.94    | 3388.49   | 866.83    | 9416.17   | 0.14    |
| hsa-miR-424-3p   | 16.02     | 20.66     | 11.32     | 47.46     | 0.51    |
| hsa-miR-425-5p   | 12.02     | 19.70     | 7.55      | 32.79     | 0.42    |
| hsa-miR-4485-3p  | 2.40      | 29.24     | 1.62      | 25.89     | 0.07    |
| hsa-miR-4488     | 5.61      | 143.01    | 2.70      | 68.17     | 0.04    |
| hsa-miR-450a-5p  | 0.80      | 2.54      | 2.16      | 6.90      | 0.31    |

|                  |          |           |          |          |        |
|------------------|----------|-----------|----------|----------|--------|
| hsa-miR-450b-5p  | 2.40     | 2.86      | 2.70     | 1.73     | 1.20   |
| hsa-miR-451a     | 18.43    | 18.43     | 52.29    | 100.10   | 0.76   |
| hsa-miR-4521     | 5007.03  | 232.96    | 3942.24  | 598.00   | 14.04  |
| hsa-miR-454-3p   | 48.87    | 2.22      | 35.58    | 3.45     | 16.14  |
| hsa-miR-454-5p   | 4.01     | 1.91      | 1.62     | 5.18     | 1.21   |
| hsa-miR-455-5p   | 1029.45  | 55.62     | 429.10   | 169.13   | 10.52  |
| hsa-miR-4677-3p  | 50.47    | 0.95      | 43.13    | 1.73     | 38.96  |
| hsa-miR-4683     | 8.81     | 1.59      | 7.01     | 6.04     | 3.35   |
| hsa-miR-4731-5p  | 1.60     | 0.32      | 0.00     | 2.59     | 2.52   |
| hsa-miR-4746-5p  | 3.20     | 0.64      | 10.78    | 4.31     | 3.77   |
| hsa-miR-484      | 49.67    | 5.08      | 132.61   | 15.53    | 9.15   |
| hsa-miR-486-3p   | 0.80     | 1.91      | 17.25    | 16.40    | 0.74   |
| hsa-miR-486-5p   | 0.80     | 1.91      | 17.25    | 17.26    | 0.71   |
| hsa-miR-498      | 278.79   | 1.59      | 218.86   | 0.00     | 175.45 |
| hsa-miR-500a-3p  | 87.32    | 43.86     | 194.07   | 72.49    | 2.33   |
| hsa-miR-501-3p   | 22.43    | 23.84     | 44.20    | 81.98    | 0.74   |
| hsa-miR-501-5p   | 1.60     | 4.13      | 4.31     | 10.36    | 0.40   |
| hsa-miR-502-3p   | 37.65    | 41.95     | 54.99    | 56.95    | 0.93   |
| hsa-miR-503-5p   | 1.60     | 1.59      | 1.08     | 0.86     | 1.13   |
| hsa-miR-504-3p   | 9.61     | 0.32      | 2.16     | 1.00     | 16.20  |
| hsa-miR-504-5p   | 4.01     | 13.98     | 1.62     | 20.71    | 0.18   |
| hsa-miR-505-3p   | 0.80     | 1.59      | 1.62     | 10.36    | 0.33   |
| hsa-miR-505-5p   | 0.80     | 1.91      | 1.08     | 8.63     | 0.27   |
| hsa-miR-506-3p   | 546.37   | 6.36      | 554.17   | 9.49     | 72.17  |
| hsa-miR-508-5p   | 3.20     | 0.64      | 12.40    | 6.90     | 3.42   |
| hsa-miR-509-3-5p | 15.22    | 23.20     | 15.09    | 50.05    | 0.48   |
| hsa-miR-509-3p   | 6.41     | 11.12     | 6.47     | 29.34    | 0.40   |
| hsa-miR-509-5p   | 5.61     | 3.50      | 3.23     | 7.77     | 1.01   |
| hsa-miR-5096     | 0.80     | 0.64      | 0.00     | 0.00     | 1.26   |
| hsa-miR-512-3p   | 7096.36  | 1386.92   | 5714.71  | 1945.88  | 4.03   |
| hsa-miR-514a-3p  | 22.43    | 53.39     | 14.02    | 84.57    | 0.29   |
| hsa-miR-514a-5p  | 1.60     | 1.27      | 1.08     | 2.59     | 0.84   |
| hsa-miR-515-5p   | 48.87    | 15.57     | 17.79    | 31.07    | 1.86   |
| hsa-miR-516a-5p  | 2066.90  | 12.71     | 1513.72  | 63.86    | 93.15  |
| hsa-miR-516b-5p  | 51675.75 | 329.25    | 38020.29 | 607.49   | 109.77 |
| hsa-miR-517-5p   | 4.01     | 2.22      | 3.23     | 3.45     | 1.37   |
| hsa-miR-517a-3p  | 8627.31  | 185132.19 | 3375.68  | 84471.95 | 0.04   |
| hsa-miR-517c-3p  | 464.65   | 12946.33  | 198.38   | 7803.37  | 0.03   |
| hsa-miR-518a-3p  | 1.60     | 25.42     | 1.08     | 23.30    | 0.05   |
| hsa-miR-518b     | 24.83    | 15.57     | 11.86    | 37.11    | 0.96   |
| hsa-miR-518c-3p  | 6.41     | 3.18      | 2.70     | 3.45     | 1.40   |
| hsa-miR-518c-5p  | 2043.67  | 18.43     | 1265.20  | 25.89    | 79.87  |
| hsa-miR-518e-3p  | 3.20     | 3.50      | 2.16     | 2.59     | 0.87   |
| hsa-miR-518f-5p  | 16.82    | 17.80     | 5.39     | 14.67    | 0.66   |
| hsa-miR-519a-3p  | 769.88   | 8.26      | 150.40   | 3.45     | 68.37  |
| hsa-miR-519b-3p  | 286.00   | 2.86      | 109.97   | 4.31     | 62.74  |
| hsa-miR-519c-3p  | 178.65   | 1.27      | 78.17    | 5.18     | 77.81  |
| hsa-miR-519c-5p  | 170.64   | 49.90     | 124.53   | 64.72    | 2.67   |
| hsa-miR-519d-3p  | 13.62    | 29.87     | 3.23     | 20.71    | 0.31   |
| hsa-miR-519d-5p  | 11.22    | 2.86      | 5.39     | 0.86     | 5.08   |
| hsa-miR-520a-3p  | 85.72    | 34.96     | 128.84   | 79.39    | 2.04   |
| hsa-miR-520a-5p  | 8.81     | 2.54      | 5.93     | 12.08    | 1.98   |
| hsa-miR-520b     | 22.43    | 1.91      | 8.09     | 0.86     | 10.57  |
| hsa-miR-520d-3p  | 24.83    | 0.95      | 15.09    | 2.59     | 15.94  |
| hsa-miR-520d-5p  | 3.20     | 3.18      | 0.54     | 1.73     | 0.66   |
| hsa-miR-520e     | 23.23    | 1.59      | 7.01     | 0.86     | 11.37  |
| hsa-miR-520f-3p  | 1969.97  | 53.71     | 755.78   | 67.31    | 23.95  |
| hsa-miR-520g-3p  | 13.62    | 20.34     | 4.85     | 15.53    | 0.49   |

|                   |         |        |         |         |        |
|-------------------|---------|--------|---------|---------|--------|
| hsa-miR-520g-5p   | 24.03   | 6.99   | 22.10   | 18.98   | 2.30   |
| hsa-miR-520h      | 2.40    | 2.54   | 1.62    | 0.00    | 0.95   |
| hsa-miR-522-3p    | 36.85   | 57.52  | 9.70    | 37.97   | 0.45   |
| hsa-miR-523-3p    | 22.43   | 5.08   | 5.93    | 0.86    | 5.64   |
| hsa-miR-524-5p    | 12.82   | 1.59   | 3.77    | 0.00    | 8.07   |
| hsa-miR-525-5p    | 10.41   | 3.50   | 4.31    | 6.04    | 1.85   |
| hsa-miR-526a      | 12.02   | 13.67  | 8.09    | 17.26   | 0.67   |
| hsa-miR-526b-3p   | 14.42   | 0.64   | 2.16    | 0.00    | 22.69  |
| hsa-miR-526b-5p   | 282.80  | 41.95  | 143.39  | 62.13   | 4.52   |
| hsa-miR-532-3p    | 4.01    | 6.99   | 2.70    | 12.08   | 0.40   |
| hsa-miR-532-5p    | 6358.53 | 60.70  | 5807.43 | 220.91  | 65.52  |
| hsa-miR-542-3p    | 1.60    | 1.27   | 0.00    | 1.73    | 0.63   |
| hsa-miR-548ay-3p  | 2.40    | 0.32   | 0.00    | 0.00    | 7.56   |
| hsa-miR-548b-3p   | 2.07    | 1.00   | 0.59    | 1.00    | 1.33   |
| hsa-miR-548o-3p   | 8.01    | 2.86   | 11.32   | 12.08   | 1.87   |
| hsa-miR-550a-3-5p | 0.80    | 1.27   | 5.93    | 2.59    | 1.46   |
| hsa-miR-550a-5p   | 0.80    | 1.27   | 5.93    | 2.59    | 1.46   |
| hsa-miR-551b-5p   | 4.81    | 3.18   | 10.24   | 20.71   | 1.00   |
| hsa-miR-574-3p    | 38.45   | 18.12  | 35.58   | 20.71   | 1.92   |
| hsa-miR-574-5p    | 576.81  | 3.18   | 348.24  | 4.31    | 131.10 |
| hsa-miR-576-3p    | 1.60    | 3.18   | 1.08    | 12.08   | 0.30   |
| hsa-miR-577       | 4.01    | 5.40   | 2.16    | 3.45    | 0.68   |
| hsa-miR-584-5p    | 363.71  | 300.33 | 535.30  | 649.78  | 1.02   |
| hsa-miR-589-5p    | 22.43   | 5.08   | 65.77   | 20.71   | 3.79   |
| hsa-miR-590-3p    | 1176.85 | 3.18   | 718.05  | 3.45    | 289.16 |
| hsa-miR-597-3p    | 2.40    | 0.64   | 4.31    | 2.59    | 2.72   |
| hsa-miR-615-3p    | 142.60  | 23.52  | 368.19  | 121.67  | 4.54   |
| hsa-miR-619-5p    | 4.01    | 2.86   | 2.70    | 7.77    | 0.87   |
| hsa-miR-625-3p    | 1.60    | 3.81   | 3.77    | 18.98   | 0.31   |
| hsa-miR-628-3p    | 1.60    | 0.32   | 1.62    | 0.86    | 3.46   |
| hsa-miR-628-5p    | 0.80    | 4.45   | 1.62    | 6.90    | 0.21   |
| hsa-miR-629-3p    | 0.80    | 1.91   | 0.54    | 5.18    | 0.26   |
| hsa-miR-629-5p    | 230.72  | 22.25  | 459.83  | 80.25   | 8.05   |
| hsa-miR-6505-5p   | 0.80    | 0.64   | 0.00    | 0.86    | 0.63   |
| hsa-miR-6515-5p   | 18.43   | 0.64   | 5.39    | 0.00    | 28.99  |
| hsa-miR-6516-3p   | 3.20    | 0.64   | 1.08    | 0.00    | 5.04   |
| hsa-miR-6516-5p   | 0.80    | 1.59   | 0.00    | 0.86    | 0.25   |
| hsa-miR-659-5p    | 0.80    | 1.27   | 0.54    | 0.86    | 0.63   |
| hsa-miR-660-5p    | 67.29   | 10.17  | 45.82   | 13.81   | 4.97   |
| hsa-miR-671-3p    | 12.82   | 18.75  | 12.94   | 53.50   | 0.46   |
| hsa-miR-671-5p    | 374.13  | 1.27   | 176.82  | 4.31    | 167.64 |
| hsa-miR-708-5p    | 1005.41 | 46.08  | 719.66  | 122.53  | 13.85  |
| hsa-miR-744-5p    | 598.44  | 97.25  | 439.88  | 88.88   | 5.55   |
| hsa-miR-7-5p      | 1081.52 | 74.37  | 8309.81 | 1409.15 | 10.22  |
| hsa-miR-760       | 1.60    | 1.59   | 18.87   | 4.31    | 2.69   |
| hsa-miR-7641      | 8.01    | 1.27   | 1.62    | 19.85   | 3.19   |
| hsa-miR-767-5p    | 20.03   | 5.08   | 19.95   | 15.53   | 2.61   |
| hsa-miR-769-3p    | 4.81    | 0.32   | 2.16    | 0.00    | 15.12  |
| hsa-miR-769-5p    | 472.66  | 6.04   | 580.58  | 35.38   | 47.34  |
| hsa-miR-7704      | 8.81    | 39.73  | 7.01    | 41.42   | 0.20   |
| hsa-miR-7706      | 3.20    | 0.95   | 1.08    | 15.53   | 1.72   |
| hsa-miR-877-5p    | 20.03   | 5.72   | 49.06   | 44.87   | 2.30   |
| hsa-miR-92a-1-5p  | 60.08   | 20.34  | 32.34   | 121.67  | 1.61   |
| hsa-miR-92a-3p    | 397.36  | 411.56 | 452.82  | 1316.81 | 0.65   |
| hsa-miR-92b-3p    | 4.81    | 0.64   | 1.62    | 6.90    | 3.90   |
| hsa-miR-93-3p     | 0.80    | 0.64   | 1.08    | 11.22   | 0.68   |
| hsa-miR-93-5p     | 235.53  | 77.55  | 188.68  | 307.20  | 1.83   |
| hsa-miR-9-3p      | 15.22   | 12.39  | 9.70    | 14.67   | 0.94   |

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|                |        |        |         |        |       |
|----------------|--------|--------|---------|--------|-------|
| hsa-miR-941    | 37.65  | 41.00  | 70.08   | 249.38 | 0.60  |
| hsa-miR-95-3p  | 2.40   | 2.22   | 0.54    | 3.45   | 0.62  |
| hsa-miR-9-5p   | 208.29 | 169.39 | 113.74  | 444.40 | 0.74  |
| hsa-miR-96-5p  | 2.40   | 6.67   | 1.62    | 13.81  | 0.24  |
| hsa-miR-98-5p  | 987.79 | 83.90  | 1554.69 | 94.92  | 14.08 |
| hsa-miR-99a-5p | 133.79 | 19.07  | 13.48   | 29.34  | 3.74  |
| hsa-miR-99b-3p | 11.22  | 26.06  | 12.40   | 132.89 | 0.26  |
| hsa-miR-99b-5p | 69.70  | 115.37 | 52.83   | 516.89 | 0.35  |

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**Table S3.** Significantly affected processes, components or functions by the enriched miRs in mi-TRAP eluates of Table 1. 3' UTR.

| GO_accession | Description  | Term type | q-Value                |
|--------------|--|-----------|------------------------|
| GO:0005515   | protein binding  | MF        | $1.10 \times 10^{-19}$ |
| GO:0005524   | ATP binding  | MF        | $1.10 \times 10^{-19}$ |
| GO:0015031   | protein transport  | BP        | $1.10 \times 10^{-19}$ |
| GO:0005789   | endoplasmic reticulum membrane                                   | BCP       | $8.20 \times 10^{-11}$ |
| GO:0055085   | transmembrane transport  | BCP       | $9.73 \times 10^{-09}$ |
| GO:0042803   | protein homodimerization activity                                | MF        | $4.40 \times 10^{-08}$ |
| GO:0005783   | endoplasmic reticulum  | CC        | $1.87 \times 10^{-07}$ |
| GO:0006952   | defense response   | BP        | $1.85 \times 10^{-03}$ |
| GO:0016032   | viral process  | BP        | $3.08 \times 10^{-02}$ |
| GO:0016887   | ATPase activity  | MF        | $1.50 \times 10^{-01}$ |
| GO:0048002   | antigen processing and presentation of peptide antigen           | BP        | $1.46 \times 10^{-02}$ |
| GO:0015833   | peptide transport  | BP        | $7.64 \times 10^{-03}$ |
| GO:0002478   | antigen processing and presentation of exogenous peptide antigen | BP        | $2.56 \times 10^{-02}$ |
| GO:0019882   | antigen processing and presentation                              | BP        | $5.47 \times 10^{-02}$ |
| GO:0019884   | antigen processing and presentation of exogenous antigen         | BP        | $7.39 \times 10^{-02}$ |
| GO:0050851   | antigen receptor-mediated signaling pathway                      | BP        | $4.35 \times 10^{-02}$ |
| GO:0002250   | adaptive immune response   | BP        | $1.56 \times 10^{-01}$ |
| GO:0042626   | ATPase activity coupled to transmembrane movement of substances  | MF        | $1.31 \times 10^{-01}$ |
| GO:0030176   | integral component of endoplasmic reticulum membrane             | CC        | $2.39 \times 10^{-01}$ |
| GO:0050854   | regulation of antigen receptor-mediated signaling pathway        | BP        | $2.78 \times 10^{-01}$ |