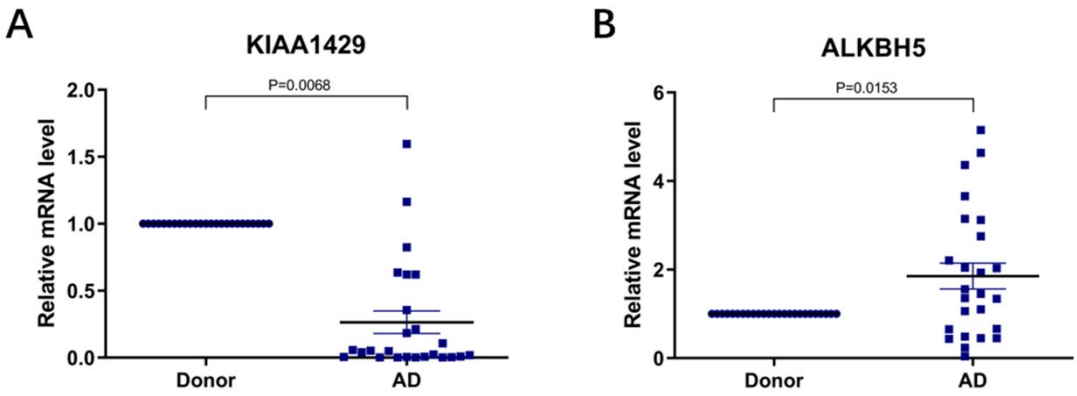
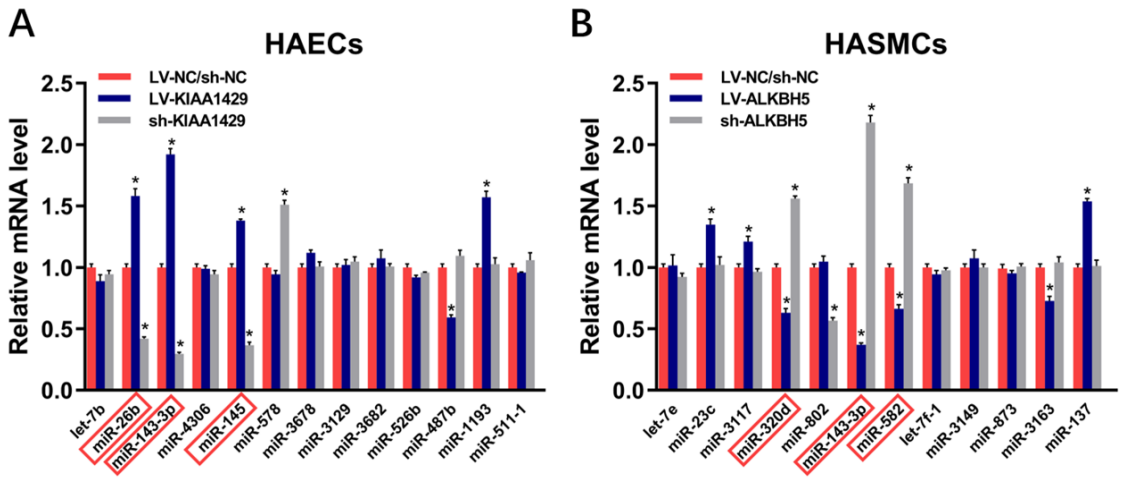
# Supplementary Figures and Tables

## Supplementary Figure. 1




**The changes in the expression levels of KIAA1429 and ALKBH5 in clinical samples. (A-B)** The low expression of KIAA1429 or high-expression of ALKBH5 was confirmed in 25 pairs of aortic tissues from AD patients compared with donors. Data are presented as the mean ± SEM (N⩾3 per group); *P < 0.05.

# Supplementary Figure. 2

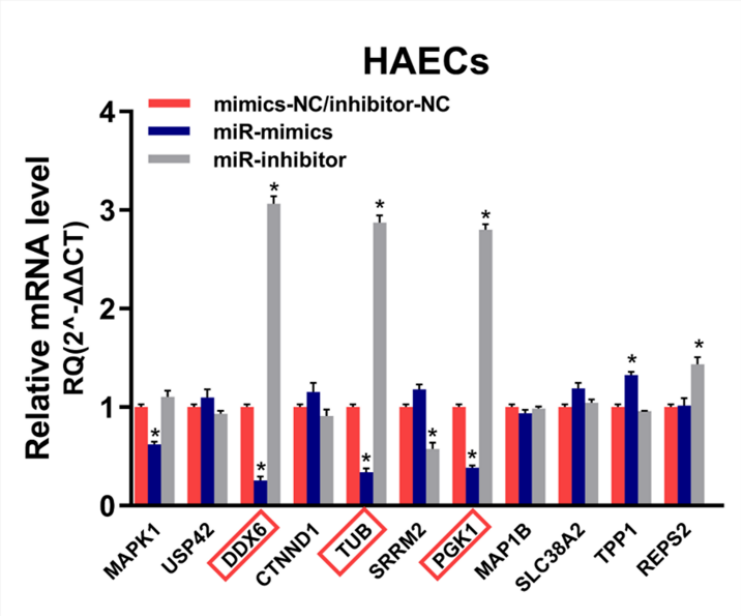



**The changes in the expression levels of candidate miRNAs were examined. (A)** MiR-26b, miR-143-3p, and miR-145 increased when KIAA1429 was overexpressed and decreased when KIAA1429 was silenced in HAECs. **(B)** MiR-320d, miR-143-3p, and miR-582 were reduced when ALKBH5 was overexpressed and increased when ALKBH5 was silenced in HASMCs. Data are presented as the mean ± SEM (N⩾3 per group); ⁎P < 0.05.

# Supplementary Figure. 3

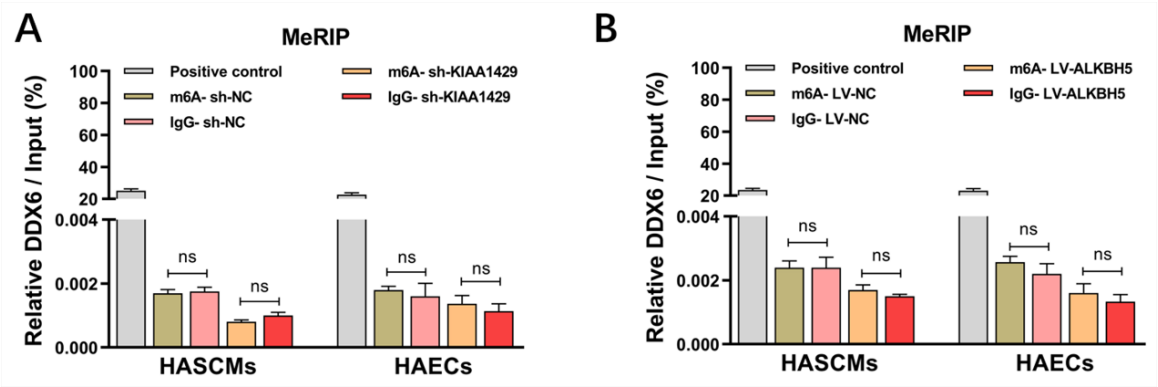
Two RRACH m6A sequence motifs, [GGAC] base sequence, in pri-miR-143-3p region (only one sequence motif presents outside the pre-miRNA region), were found.

## Supplementary Figure. 4



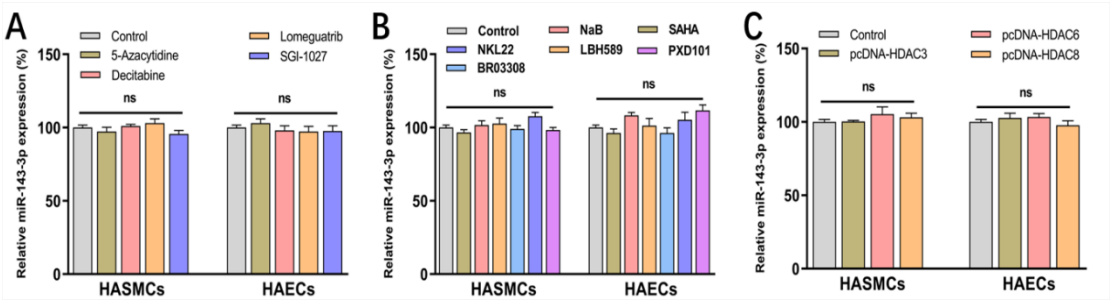

**Only the levels of DDX6, TUB, and PGK1 both changed after the upregulation and downregulation of miR-143-3p in HAECs.** Data are presented as the mean ± SEM (N⩾3 per group); ⁎P < 0.05.

## Supplementary Figure. 5



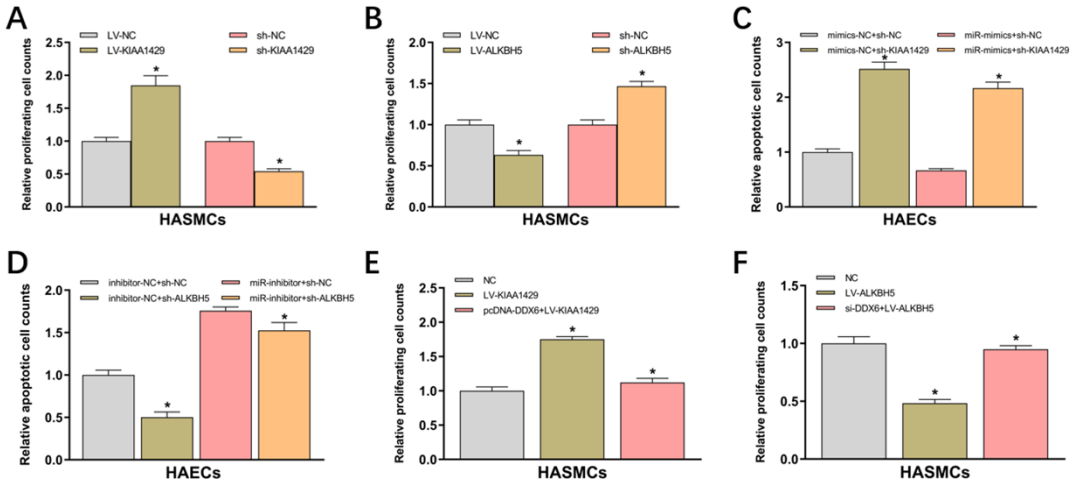

**After the binding site of the 3′-UTR region of DDX6 was mutated, the amount of DDX6 precipitated by m6A and IgG did not change significantly when KIAA1429 or ALKBH5 was disturbed in HASMCs and HAECs.** Data are presented as the mean ± SEM (N⩾3 per group); ns P > 0.05.

# Supplementary Figure. 6




**Neither DNA methylation nor histone acetylation is related to the decline of miR-143-3p. (A)** By treating cells with multiple DNA methyltransferase inhibitors and examining their effects on miR-143-3p expression, we found no significant difference between groups. **(B)** HDAC inhibitors had no significant influence on the miR-143-3p level. **(C)** The overexpression of HDAC also had no impact on miR-143-3p expression. Data are presented as the mean ± SEM (N⩾3 per group); ns $P > 0.05$.

# Supplementary Figure. 7




**Statistical analysis of the corresponding EdU proliferation and TUNEL apoptosis experiments in the main text. (A)** Results of statistical analysis of Fig 3B. **(B)** Results of statistical analysis of Fig 4B. **(C)** Results of statistical analysis of Fig 6D. **(D)** Results of statistical analysis of Fig 6F. **(E)** Results of statistical analysis of Fig 8F. **(F)** Results of statistical analysis of Fig 8M. Data are presented as the mean ± SEM (N≥3 per group); ns $P > 0.05$.

# Supplementary Table. 1

**Clinical characteristics of AD patients and donors enrolled in this study**

| | Donor group (n =25) | AD group (n = 25) | *P*-value |
|---|---|---|---|
| Ages (year) | 49.6 ± 7.5 | 50.8 ± 10.1 | 0.338 |
| Male (n) | 16 | 18 | 0.762 |
| Smoking history (n) | 10 | 13 | 0.570 |
| Drinking history (n) | 8 | 11 | 1.000 |
| Hypertension (n) | 5 | 17 | **0.002 |
| Diabetes mellitus (n) | 2 | 5 | 0.415 |
| SBP (mmHg) | 127.9 ± 12.3 | 148.2 ± 17.1 | *0.018 |
| DBP (mmHg) | 79.5 ± 5.4 | 93.2 ± 7.4 | 0.118 |
| Fasting blood glucose(mmol/L) | 6.01 ± 0.8 | 8.5 ± 2.8 | 0.894 |
| TC (mmol/L) | 4.07 ± 0.5 | 4.35 ± 0.8 | 0.938 |

SBP, systolic blood pressure; DBP, diastolic blood pressure; TC, total cholesterol. *$P < 0.05$ and **$P < 0.01$.

# Supplementary Table. 2

**The primer sequences used in the present study**

| Name | | Sequences |
|---|---|---|
| METTL3 | Sense | 5'- CAAGCTGCACTTCAGACGAA-3' |
| | Anti-sense | 5'- GCTTGGCGTGTGGTCTTT-3' |
| METTL14 | Sense | 5'- AGAAACTTGCAGGGCTTCCT -3' |
| | Anti-sense | 5'- TATCCCTCTTGGTCTGTGGAG-3' |
| WTAP | Sense | 5'- GGCGAAGTGTCGAATGCT -3' |
| | Anti-sense | 5'- CCAACTGCTGGCGTGTCT -3' |
| KIAA1429 | Sense | 5'- GAAGGCTGGAGTTGCTTGAG -3' |
| | Anti-sense | 5'- ACCCTTGTCCAAACATGCAC -3' |
| MET16 | Sense | 5'- GAACCAGGTGGCCCTAGATT -3' |
| | Anti-sense | 5'- AACGGAGGAACGGTATTGGT -3' |
| RBM15B | Sense | 5'- GCAGCCCTGTCCATTGTATG -3' |
| | Anti-sense | 5'- TGACAGTAGGAAGCAGCACT -3' |
| YTHDC1 | Sense | 5'- AGATCCTGGGATGAGGAGGT -3' |
| | Anti-sense | 5'- AGAGCCAGGAGGATTTGGAC -3' |
| YTHDF1 | Sense | 5'- CATTCCTGTGGGTTCTTGGT -3' |
| | Anti-sense | 5'- CATCTGAAGGAACAAACTCCGGA-3' |
| HNRNP | Sense | 5'- CATTCCTGTGGGTTCTTGGT -3' |

| | | |
|---|---|---|
| | Anti-sense | 5'- GAAGTACGGCACCAGCATTT -3' |
| eIF3 | Sense | 5'- TGCCCTCAAGATGCACATCCG A-3' |
| | Anti-sense | 5'- GGGACAGGAGAAGGGCTTCTC -3' |
| IGF2BP1 | Sense | 5'-ATCTGCGGCAAGGCGTTTTCCA -3' |
| | Anti-sense | 5'- GAGCCCTCAGATTTGACCTGTC- 3' |
| ALKBH5 | Sense | 5'- CCCGAGGGCTTCGTCAACA -3' |
| | Anti-sense | 5'- CGACACCCGAATAGGCTTGA -3' |
| FTO | Sense | 5'- TGGGTTCATCCTACAACGG -3' |
| | Anti-sense | 5'- CCTCTTCAGGGCCTTCAC -3' |
| MAPK1 | Sense | 5'- GAGGAAGATGGATTGGTTGC -3' |
| | Anti-sense | 5'- GCTGGCATAGGAGGATGAAG -3' |
| USP42 | Sense | 5'- CTACCAGCCATACGAGATTCC -3' |
| | Anti-sense | 5'- AAGAAGACAAAGAGGCAGAGG- 3' |
| DDX6 | Sense | 5'- AACAACCTTAGTTTTGTGAGAGCA -3' |
| | Anti-sense | 5'- TAGTTGGAATCGCCCGACTCTCGT-3' |
| CTNMD1 | Sense | 5'- ACTGCCAAGTGAGAGAAGTGG-3' |
| | Anti-sense | 5'- AGGTGCTGTTTCGGTGCTAC- 3' |
| TUB | Sense | 5'- TATGCCTAGTCCAGCCACAG-3' |
| | Anti-sense | 5'- GAGCGAACAAAGCGGTGTAT-3' |
| SRRM2 | Sense | 5'- CACCGTGGGATCTGAGAGTA-3' |
| | Anti-sense | 5'- CACGAGGTCTTGCAAGGATG-3' |
| PGK1 | Sense | 5'- GGAGACAGGGTTGCCATTG -3' |
| | Anti-sense | 5'- CGCAGAAAGAGTTCCAGCTA -3' |
| MAP1B | Sense | 5'- AGCGAGGTAAAGTTGCGTCT -3' |
| | Anti-sense | 5'- TGGTTTTCTGGGCCATACCG -3' |
| SLC38A2 | Sense | 5'-CTCTGAATAGTCCAGTGAGACCT-3' |
| | Anti-sense | 5'-CTGACTCTTAGAGGTAGAATGAGC-3' |
| TPP1 | Sense | 5'- CAGCAGATGAATGGAAGTGA -3' |
| | Anti-sense | 5'- TGCGGAAGTATGGCATGTGTC -3' |
| REPS2 | Sense | 5'-AAAAGAATGCTTTAGGTGGG-3' |
| | Anti-sense | 5'-AAGGAATACTCCCTGACTTC-3' |
| GAPDH | Sense | 5'- CCACAGTCCATGCCATCAC -3' |
| | Anti-sense | 5'- GCTTCACCACCTTCTTGATG- 3' |
| U6 | Forward | 5'- GGAACGATACAGAGAAGATTAGC-3' |
| | Reverse | 5'- CGGAACGCTTCACGAATTTGCG -3' |
| Let-7b | Forward | 5'- GCAACGATACAGTGAAGATTC-3' |
| | Reverse | 5'- TGGAACGCTTCACCAATTTGCG -3' |
| MiR-26b | Forward | 5'- ACCTGCAATTCCTTGCCACTTC -3' |
| | Reverse | 5'- ATGTCGATGATTGCCTGCAC -3' |
| MiR-143-3p | Forward | 5'- TTTCTCAGACGTGCGCAATG -3' |
| | Reverse | 5'- GTTGATGTTGATACAGCTCTC -3' |
| MiR-4306 | Forward | 5'- TAACCAGGTGGCCCTAGATA -3' |
| | Reverse | 5'- AACGGAGGAAGCGTATTGGT -3' |
| MiR-145 | Forward | 5'- ACAGCCCTGTCCATTGTATG -3' |

| | | |
|---|---|---|
| | Reverse | 5'- TGACAGTAGGAAGCAGCACC -3' |
| MiR-578 | Forward | 5'- GAGATCCTGGGATGAGGAGGG -3' |
| | Reverse | 5'- CAGAGCCAGGAGGATTTGGAC -3' |
| MiR-3678 | Forward | 5'- CAATCCTGTGGGTTCTTGGT -3' |
| | Reverse | 5'- TATGTGAAGGAACAAACTCCGGA-3' |
| MiR-3129 | Forward | 5'- ATTCCTGTGGGTTCTTGGCCT -3' |
| | Reverse | 5'- GAAGTACGGCACCAGCATTT -3' |
| MiR-3682 | Forward | 5'- CTGCCCTGTCATGCACATAGTA-3' |
| | Reverse | 5'- CGGACAGGAGAACGGCTTCTC -3' |
| MiR-526b | Forward | 5'-ATCTGCGGCAAGGCGTTATCCG -3' |
| | Reverse | 5'- GAGCCCTCTGATTTGACCTGTC- 3' |
| MiR-487b | Forward | 5'- CGAACGATACAGAGAAGATTCG-3' |
| | Reverse | 5'- ATGGAAGCTTTCACGAATTTAC -3' |
| MiR-1193 | Forward | 5'- CCTGCAATTCCTTGCCACTTG -3' |
| | Reverse | 5'- GATGTCCATGATTGCCTGCAC -3' |
| MiR-511-1 | Forward | 5'- TGAGGGCTGGAGTTGCTTGAC -3' |
| | Reverse | 5'- ATCCTTGTCCAAACATGCAG -3' |
| Let-7e | Forward | 5'- TAACCACGTGGCCCTAGATC -3' |
| | Reverse | 5'- AACGGTGGAACGGTATTGGG -3' |
| MiR-23c | Forward | 5'- GCAGTCCTGTCCATTGTATG -3' |
| | Reverse | 5'- CGACAGTAGGAAGCCGCAC -3' |
| MiR-3117 | Forward | 5'- GATCCTGGGATGAGGAGGTG -3' |
| | Reverse | 5'- CAGAGCCAGGAGGATTTGCAC -3' |
| MiR-320d | Forward | 5'- CATTCCTGTGGGTTCTTGGTG -3' |
| | Reverse | 5'- CGATATGTAGGAACAAACTCC-3' |
| MiR-802 | Forward | 5'- AATTCCTGTGGGTTCTTGGTT -3' |
| | Reverse | 5'- CAAGTACGGCACCAGCATTTA -3' |
| MiR-582 | Forward | 5'- AGCCCTCACGATGCACATCCGT-3' |
| | Reverse | 5'- AGGACAGGAGAAGCGCTTCAG -3' |
| Let-7f-1 | Forward | 5'-ACTGCGGCAAGGCGTTTTCCAG -3' |
| | Reverse | 5'- AGCCCTCAGATATGACCTGTCG- 3' |
| MiR-3149 | Forward | 5'- CGATTCCTGTGAGTTCTTGGTG -3' |
| | Reverse | 5'- GCATCTGAAGGAACAAACTCC-3' |
| MiR-873 | Forward | 5'- GATTCATGTGGGTTCTTGGTA -3' |
| | Reverse | 5'- CGAAGTACGGCACCAGCATTTG -3' |
| MiR-3163 | Forward | 5'- ATGCGCTCAAGATGCACATCCT-3' |
| | Reverse | 5'- CGGACAGCAGAAGGGCTTCTCG -3' |
| MiR-137 | Forward | 5'-TCTGCGGCACGGCGTTTTCCA -3' |
| | Reverse | 5'- GCCCTCAGATTTGACCTGTCT- 3' |

# Supplementary Table. 3

**Primary antibodies used in this study**

| Name | Manufacturer | Product code | Dilution rate |
|---|---|---|---|
| Anti-KIAA1429 | Invitrogen, USA | # PA5-95717 | 1:10000 |
| Anti-ALKBH5 | Abcam, UK | # ab69325 | 1:500 |
| Anti-DGCR8 | Abcam, UK | # ab191875 | 1:1000 |
| Anti-IgG | Abcam, UK | # ab172730 | 1:5000 |
| Anti-DDX6 | Cell Signaling Technology, UK | # 5246 | 1:5000 |
| Anti-GAPDH | Abcam, UK | # ab8245 | 1:5000 |

# Supplementary Table. 4

**The databases involved in the bioinformatics analysis in this study.**

| Database name | Available addresses |
|---|---|
| LinkedOmics | http://www.linkedomics.org/login.php |
| m6AVar | http://m6avar.renlab.org/index.html |
| TargetScan | http://www.targetscan.org/ |
| miRanda | http://www.microrna.org/microrna/home.do |
| PicTar | http://www.pictar.org/ |