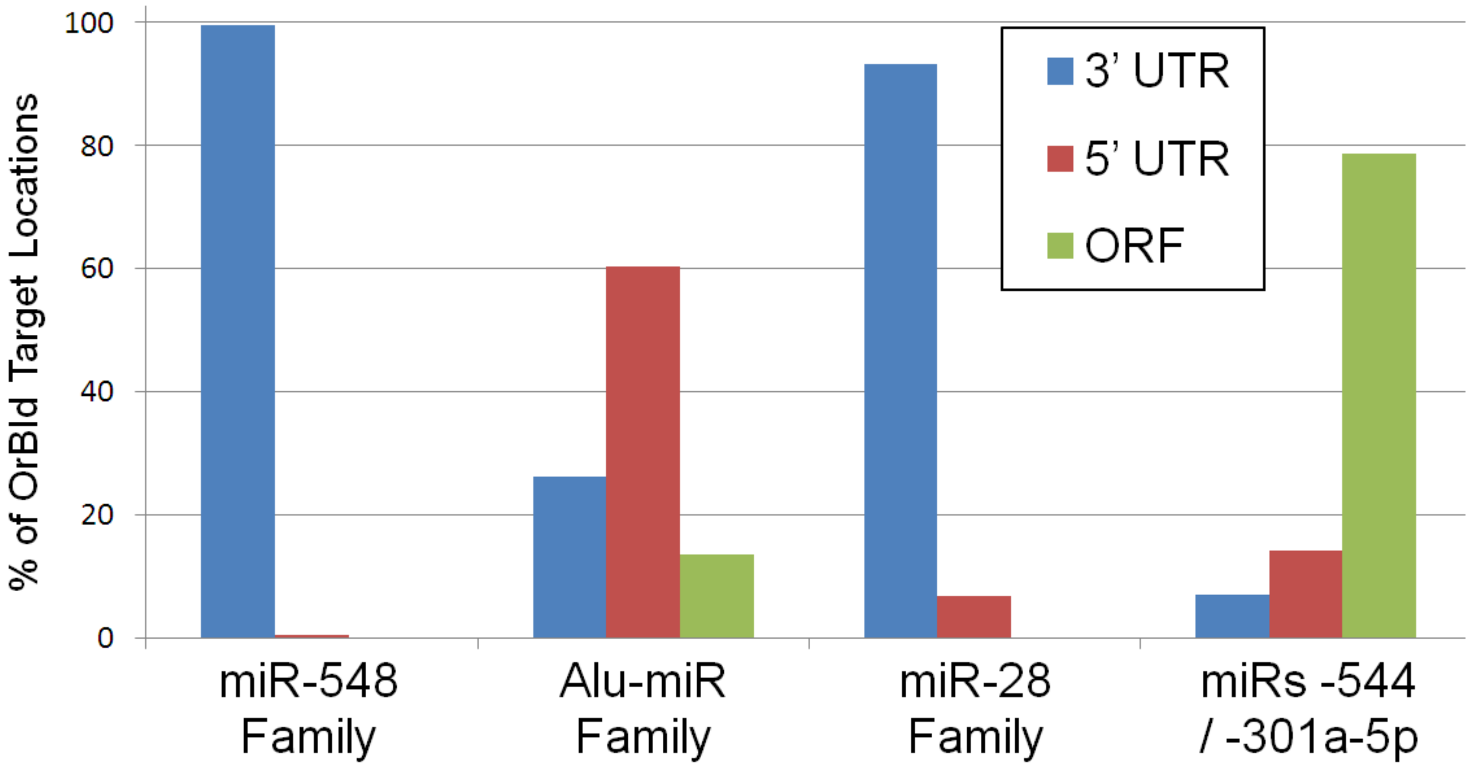
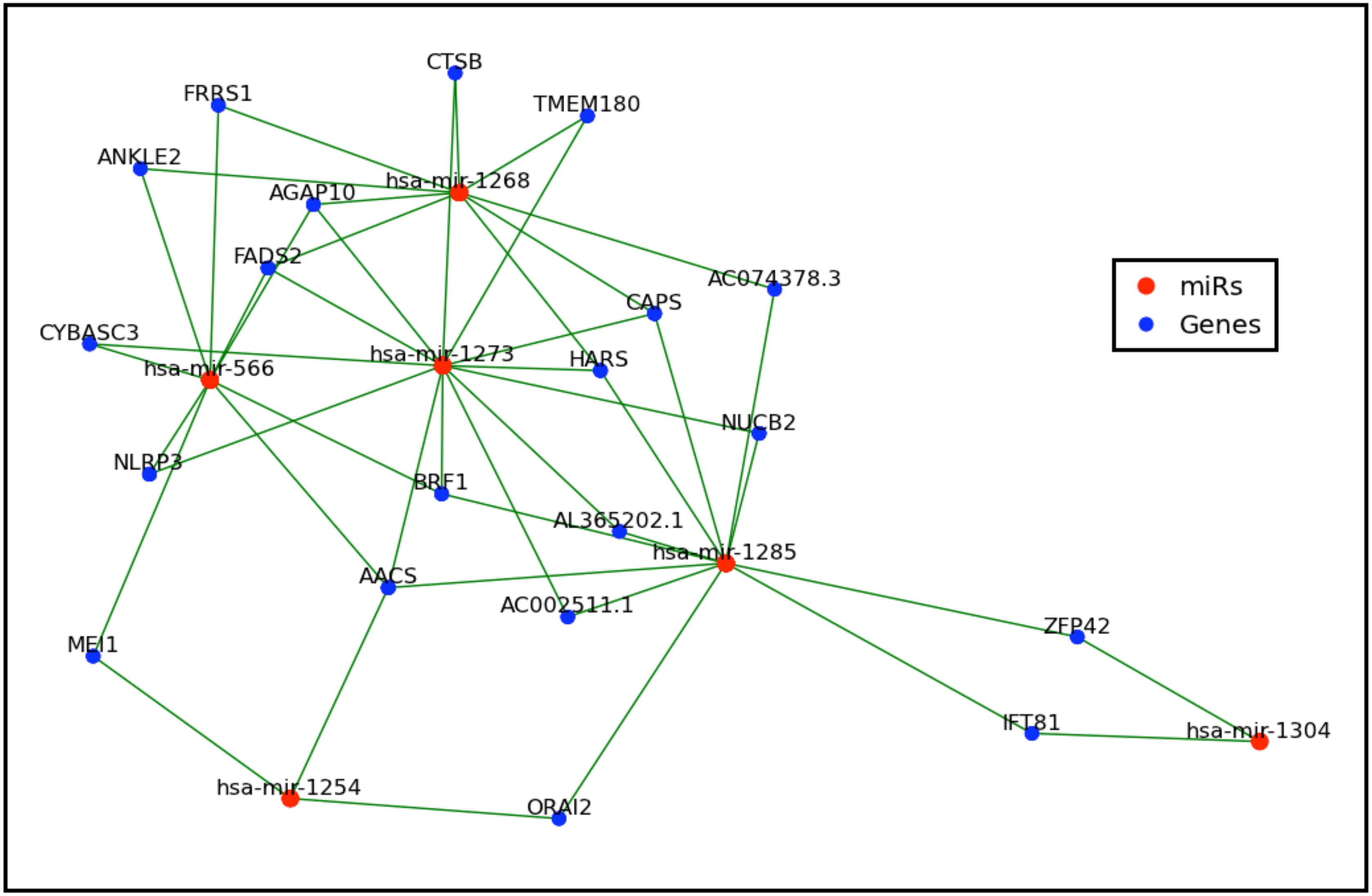


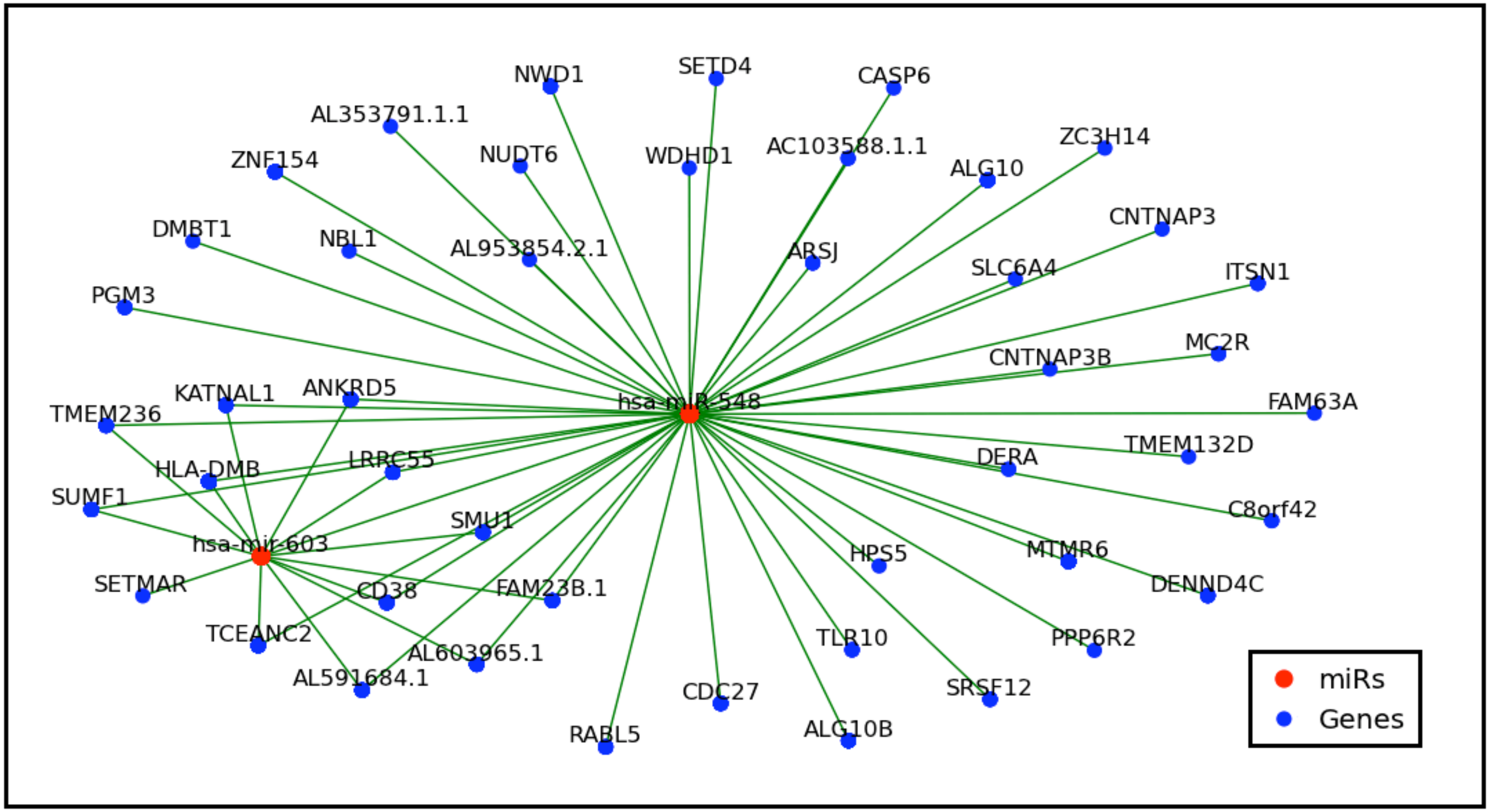
Supplemental Figure 1. MiR family mRNA targeting biases. Distributions of miRs -544 and -301a-5p, and miR-28, miR-548, and Alu-miR family target locations within mRNA transcripts as predicted by OrbId.

```
mir28           GTCCTTGCCCTCAAGGAGCTCACAGTCTAT-TGAGT-----TACCTTTCTGACTTTCCC-ACTAGATTGTGAGCTCCTGGAGGGCAGGCACT
mir708          GTAACTGCCCTCAAGGAGCTTACAATCTAGCTGGGGGTAAATGACTTGCACATGAACACAACTAGACTGTGAGCTTCTAGAGGGCAGGGACC
mir151a         TTTCCTGCCCTCGAGGAGCTCACAGTCTAG-TATGT--------------CTCATCCCCTACTAGACTG-AAGCTCCTTGAGGACAGGGATG
                 *   ******* ******* *** ****  *  *                     * * ****** **  **** ** **** **** *
```

Supplemental Figure 2. Pre-miRs -28, -151 and -708 alignment. ClustalW alignment of pre-miRs -28, -151 and -708. Mature miRs are highlighted in yellow. *, conserved nucleotide.



Supplemental Figure 3. OrbId Alu family target network. MiRs -1285-5p and -3p have been combined and are shown collectively as were miR-1273s. Only shared targets are depicted. Green lines indicate miR regulation.



Supplemental Figure 4. MiR-548 and miR-603 family target network. Current miR-548 family members are shown collectively. All targets of both the miR-548 family and miR-603 are depicted indicating 13 of 14 miR-603 targets are also targeted by an existing miR-548 family member. Green lines indicate miR regulation.

```
AAAAGGGGGTTTTCCCGCTGCTGCTGCTCAAGCTGCTCCAACGTAG      mRNA
         TTTTCCCGCTGCTGCTGCTCAAGCTGC                TE
      GGGTTTTCCGC                                   miR
```

```
AAAAGGGGGTTTTCCCGCTGCTGCTGCTCAAGCTGCTCCAACGTAG      mRNA
         TTTTCCCGCTGCTGCTGCTCAAGCTGC                TE
          TTTCCCGCTGCT                              miR
```

```
AAAAGGGGGTTTTCCCGCTGCTGCTGCTCAAGCTGCTCCAACGTAG      mRNA
         TTTTCCCGCTGCTGCTGCTCAAGCTGC                TE
                            CAAGCTGCCCGC            miR
```

Supplemental Figure 5. Cartoon illustrating three potential scenarios for OrbId alignment. If a miR and its corresponding TE had overlapping start and stop loci on the same mRNA, it was considered a match.