

Gene list file

Chr1 AT1G01010 + 3631
Chr1 AT1G01020 - 5928
Chr1 AT1G01030 - 11649
Chr1 AT1G01040 + 23146
Chr3 ath-MIR167a + 8108072
.....

Genes in family

ath-MIR167a ath-MIR167b
ath-MIR167c ath-MIR167d

Gene sequences file

>AT1G51370
ATGGGTGTC.....TTTAACCCCTTCTTGA

>AT1G50920
ATGGTTCAA.....CGACAGGCGTTGA

>AT1G36960
ATGACTCGT.....ATCTGGTACATAG

>AT1G44020
ATGGATTCA.....ATATTCTCCAATGA
.....

Step 1: Generate MSY file

Step 2: Homologous gene table

Step 3: Detection of microsynteny

Step 4: Estimation of synonymous substitutions

MSY file

```
<?xml version="1.0"?>
<msy >
  <family species="Arabidopsis">
    <gene id="ath -MIR167d" chr="Chr1" strand="1" pos="11137539" />
    .....
  </family>
  <neighbor family_gene ="ath -MIR167d">
    <gene id="AT1G31170" chr="Chr1" strand="1" pos="11133485">
      <seq >ATGGCGAATTGATGATG .....GCATCATCTTCGCTGA </seq>
    </gene>
    .....
  </neighbor>
  .....
</msy >
```

----- Synteny data -----

Segment1	Segment2	Number of homology	Expected value
ath-MIR167a	ath-MIR167b	7	1.62E-10
ath-MIR167c	ath-MIR167a	4	0.003467643

Pair of Segments	Homology genes
ath-MIR167a - ath-MIR167b	AT3G22550/AT3G63210
ath-MIR167a - ath-MIR167b	AT3G22740/AT3G63250
ath-MIR167a - ath-MIR167b	AT3G22750/AT3G63260
ath-MIR167a - ath-MIR167b	AT3G22810/AT3G63300
ath-MIR167a - ath-MIR167b	AT3G22830/AT3G63350
ath-MIR167a - ath-MIR167b	ath-MIR167a/ath-MIR167b
ath-MIR167a - ath-MIR167b	AT3G22910/AT3G63380
ath-MIR167c - ath-MIR167a	AT3G04580/AT3G23150
ath-MIR167c - ath-MIR167a	AT3G04630/AT3G23090
ath-MIR167c - ath-MIR167a	ath-MIR167c/ath-MIR167a
ath-MIR167c - ath-MIR167a	AT3G04850/AT3G22760

