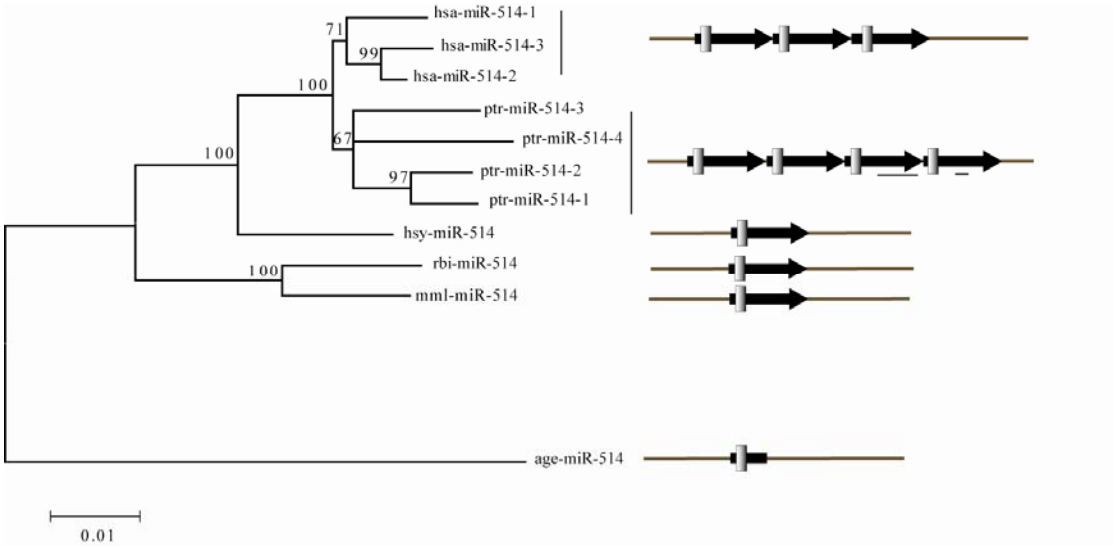
Supplemental Research Data

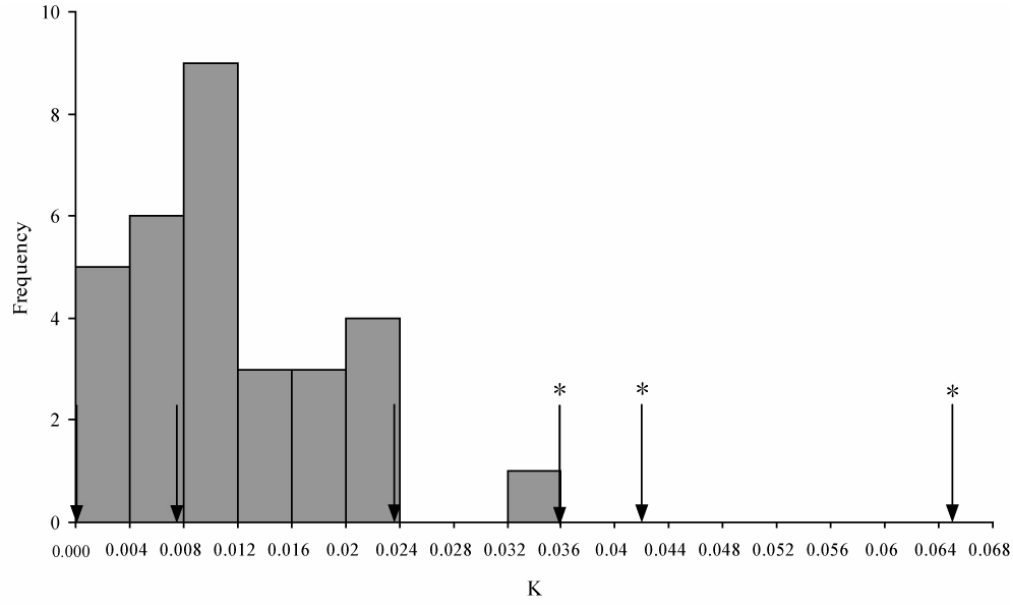


Supplemental Figure 1. The phylogenetic tree of the miR-514 duplication units. All the human copies are clustered together, so do the chimpanzee copies. The tree was reconstructed using neighbor-joining (NJ) method with 1000 bootstraps. The bootstrap values larger than 50 are shown above the branches (ptr-chimpanzee, mml- rhesus monkey, hsy-siamang, rbi-Yunnan snub-nosed monkey, age-black-handed spider monkey). miRNAs are indicated in the bar scheme. The arrows refer to duplication units and the lines below the arrow indicate gap positions.

Supplemental Figure 2. The alignment of the mature miRNA sequences in primates. The sites in red indicate sequence substitutions or in-dels.

```
hsa-miR-506           TAAGGCACCCTTCTGAGTAGA
ptr-miR-506           TAAGGCACCCTTCTGAGTAGA
hsy-miR-506           TAAGGCACCCTTCTGAGTAGA
rbi-miR-506           TAAGGCACCCTTCTGAGTAGA
mml-miR-506           TAAGGCACCCTTCTGAGTAGA
age-miR-506           AATGGCGCCCTTCTGAGTAGA

hsa-miR-507           TTTTGCACCTTTTGGAGTGAA
ptr-miR-507           TTTTGCACCTTTTGGAGTGAA
hsy-miR-507           TTTTGCACCTTTTGGAGTGAA
rbi-miR-507           TTTTGCACCTTTTGGAGTGAA
mml-miR-507           TTTTGCACCTTTTGGAGTGAA
age-miR-507           TTTGGCACTTTTTAGAGTGAA

hsa-miR-508           TGATTGTAGCCTTTTGGAGTAGA
ptr-miR-508           TGATTGTAGCCTTTTTGAGTAGA
hsy-miR-508           TGATTGTAGCCCTTTTGAGTAGA
rbi-miR-508           TGATTGTCACCTTTTTGAGTAGA
mml-miR-508           TGATTGTCGCCTTTTTGAGTAGA
age-miR-508           CGATTGTCACCTTTTTGAGTAGA

hsa-miR-510           TACTCAGGAGAGTGGCAATCACA
ptr-miR-510           TACCCAGGAGAGTGGCAATCACA
rbi-miR-510           TACTCCGGAGAGTGGCAATCACA
mml-miR-510           TACTCCGGAGAGTGGCAATCACA
hsy-miR-510           TACTCCGGAGAGTGGCAATCACA
age-miR-510           TACTCCAGAGAGTAGCAATCACG

hsa-miR-509-pre-2     TGATTGGTACGTCTGTGGGTAGA
hsa-miR-509-pre-1     TGATTGGTACGTCTGTGGGTAGA
hsa-miR-509           TGATTGGTACGTCTGTGGGTAGA
ptr-miR-509-1         TGATTGGTACGTCTGTGGATAGA
ptr-miR-509-2         TGATTGGTACGTCTGTGAGTAGA
ptr-miR-509-3         TGATTGGTACGTCTGTGGATAGA
hsy-miR-509_1         TGATTGGTACGTCTGTGGGTAGA
hsy-miR-509_2         TGATTGGTACGTCTGTAGGTAGA
rbi-miR-509           TGATTGATACGTCTGTGGGTAGA
mml-miR-509-1         TGATTGGTATGTCTGTGGGTAGA
mml-miR-509-2         TGATTGGTATGTCTGTGGGTAGA
age-miR-509-1         TGATTGACACGTCTGCAGGTAGA
age-miR-509-2         TGATTGACACGTCTGCAGATAGA

hsa-miR-514-1         ATTGACACTTCTGTGAGTAG
hsa-miR-514-2         ATTGACACTTCTGTGAGTAG
hsa-miR-514-3         ATTGACACTTCTGTGAGTAG
ptr-miR-514-1         ATTGACACTTCTGTGAGTAG
ptr-miR-514-2         ATTGACACTTCTGTGAGTAG
ptr-miR-514-3         ATTGACACTTCTGTGAGTAG
ptr-miR-514-4         ATTGACACTTCTGTGAGTAG
rbi-miR-514           ATTGACACTTCTGTGAGTAG
mml-miR-514           ATTGACACTTCTGTGAGTAG
hsy-miR-514           ATTGACACTTCTGTGAGTAG
age-miR-514           ATTGACACTTTTGTGAGTAG
```

```
hsa-miR-513-pre-2     TTCTCAAGGAGGTGTCGTTTAT
hsa-miR-513-pre-1     TTCACAAGGAGGTGTCATTTAT
hsa-miR-513-1         TTCACAGGGAGGTGTCATTTAT
hsa-miR-513-2         TTCACAGGGAGGTGTCATTTAT
ptr-miR-513-1         TTCACAGGGAGGTGTCATTTAT
ptr-miR-513-2         TTCACAAGGAGATGTCATTTAT
ptr-miR-513-3         TTCACAGGGAGGTGTCATTTAT
ptr-miR-513-4         TTCACAGGGAGGTGTCATTTAT
hsy-miR-513-1         TTCCCAAGGAGGTGTCATTTAC
hsy-miR-513-2         TTCACAAGGAGGTGTCATTTAT
hsy-miR-513-3         TTCACAGGGAGGTGTCATTTAT
hsy-miR-513-4         TTCACAAGGAGGTGTCATTTAT
rbi-miR-513-1         TTCACAGGGAGGTGTCATTTAT
rbi-miR-513-2         TTCACAAGGAGGTGTCATTTAT
rbi-miR-513-3         TTCACAGGGAGGTGTCATTTGT
rbi-miR-513-4         TTCACAGGGAGGTGTCATTTAT
rbi-miR-513-5         TTCACAGGGAGGTGTCATTTGT
mml-miR-513-1         TTCACAAGGAGGTGTCATTTAT
mml-miR-513-2         TTCACAAGGAGGTGTCATTTAT
mml-miR-513-3         TTCACAGGGAGGTGTCATTTAT
mml-miR-513-4         TTCACAGGGAGGTGTCATTTAT
mml-miR-513-5         TTCACAGGGAGGTGTCATTTAT
age-miR-513-1         TTCACAAGGAGCTGTCATTCAT
age-miR-513-2         TT-ACAAGAAGGTGCCATTCAT
age-miR-513-3         TTCACAAGGAGGTGTCATTCAT
age-miR-513-4         TTCTCAAGAAGGTGTCATTCAT
age-miR-513-5         TTCACAACGAGGTGTCATTTAT
age-miR-513-6         TT-ACAAGAAGGTGCCATTCAT
age-miR-513-7         TTCACAAGGAGGTGTCATTCAT
age-miR-513-8         TTCTCAAGAAGGTGTCATTCAT
```

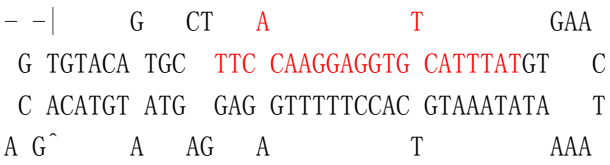


Supplemental Figure 3. The distribution of K_{TE} and Kp between human and chimpanzee. The K_{TE} of 30 local TEs are sorted by values. The mean of K_{TE} is 0.011 ± 0.008. The Kp values are indicated by arrows. (miR-513-1 = 0.065, miR-513-2 = 0.0078, miR-513-3 = 0.0237, miR-513-4 =0, miR-506 =0, miR-507 = 0, miR-508 = 0.036, miR-510 = 0.042). The asterisks indicate values out of the 99% confidence interval of K_{TE} distribution.

Supplemental Figure 4. The putative secondary structures of the precursor microRNAs in primates

hsa-miR-513-pre-2

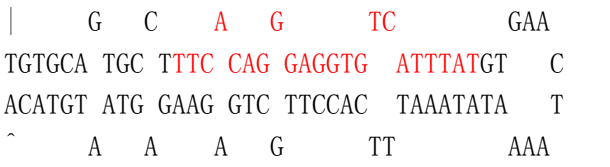
hsa-miR-513-pre-1



hsa-miR-513-1

hsa-miR-513-2

ptr-miR-513-1



ptr-miR-513-2

```
|      G    CT    A         A   T          GAA
TGTACA TGC   TTC CAAGGAG TG CATTTATGT    C
ACATGT ATG   GAG GTTTTTC AC GTAAATATA    T
^      A    AG    A         C   T          AAA
```

ptr-miR-513-3

```
|      G    C     A    G       TC         GAA
TGTACA TGC TTTC CAG GAGGTG   ATTTATGT    C
ACATGT ATG GAAG GTC TTCCAC   TAAATATA    T
^      A    A     A    G       TT         AAA
```

ptr-miR-513-4

```
|      G         A    GG      TC         GAA
TGTGCA TGCCTTTC CAG   AGGTG   ATTTATGT    C
ACATGT ATGGGAAG GTC   TCCAC   TAAATATA    T
^      A          A    TT      TT         AAA
```

hsy-miR-513-1

```
|      G    C     C   AG       TC      CG GAA
TGTACA TGC TTTC CA   GAGGTG   ATTTA   T    C
ACATGT ATG GAAG GT   TTCCAC   TAAAT   A    T
^      A    A     A   CT       TT      AT AAA
```

hsy-miR-513-2

```
AG       G    C     A          GT          GAA
  TGTACA TGC TTTC CAAGGAGGT   CATTTATGT    C
  ACATGT ATG GAAG GTTCTTCCA   GTAAATATA    T
--       A    A     A          GT          AAA
```

hsy-miR-513-3

```
|      G    C     A    GG      TC         GAA
TGTGCA TGC TTTC CAG   AGGTG   ATTTATGT    C
ACATGT ATG GAAG GTC   TCCAC   TAAATATA    T
^      A    A     A    TT      TT         AAA
```

hsy-miR-513-4

```
|      G         A           TC         GAA
TGTGCA TGCCTTTC CAAGGAGGTG  ATTTATGT    C
ACATGT ATGGGAAG GTTTTTCCAC  TAAATATA    T
^      A         A           TT         AAA
```

rbi-miR-513-1

```
       G   -     A   GG     T       -  GAA
TGTACA TGC CTTTC CAG  AGGTG CATTTAT GT   \
ACATGT ATG GAAGG GTC  TCCAC GTAAATA CA   C
       A   A     -   TT     T       T  AAT
```

rbi-miR-513-2

```
       G   C     A           T          GAA
TGTGCA TGC TTTC CAAGGAGGTG CATTTATGT    C
ACATGT ATG GAAG GTTTTTCCAC GTAAATATG    T
       A   A     A           T          AAA
```

rbi-miR-513-3

```
       G   -     A   GG     T       -  GAA
TGTACA TGC CTTTC CAG  AGGTG CATTTGT GT   \
ACATGT ATG GAAGG GTC  TCCAC GTAAATA CA   C
       A   T     -   TT     T       T  AAT
```

rbi-miR-513-4

```
       G   C     A   GG     T       -  GAA
TGTACA TGC TTTC CAG  AGGTG CATTTAT GT   \
ACATGT ATG GAAG GTC  TCCAC GTAAATA CA   C
       A   A     A   TT     T       T  AAT
```

rbi-miR-513-5

```
           -     A   GG     T       -  GAA
TGTACATTGC CTTTC CAG  AGGTG CATTTGT GT   \
ACATGTAATG GAAGG GTC  TCCAC GTAAATA CA   C
           A     -   TT     T       T AAT
```

mml-miR-513-1

```
  -    G   -     A          T       -  GAA
TT TACA TGC CTTTC CAAGGAGGTG CATTTAT GT   \
AA ATGT ATG GAAGG GTTTTTCCAC GTAAATA CA   C
  C    A   A     -          T       T  AAT
```

mml-miR-513-2

```
G      G   -     A          T       -  GAA
 TGTGCA TGC CTTTC CAAGGAGGTG CATTTAT GT   \
 ACATGT ATG GAAGG GTTTTTCCAC GTAAATA CA   C
-      A   A     -          T       T  AAT
```

mml-miR-513-3

```
       G        A   GG     T       -  GAA
GTGTACA TGCCTTTC CAG  AGGTG CATTTAT GT   \
TACATGT ATGGGAAG GTC  TCCAC GTAAATA CA   C
       A        C   TT     T       T  AAT
```

mml-miR-513-4

```
|      G   C    A   GG     TC        GAA
TGTACA TGC TTTC CAG  AGGTG  ATTTATGT   C
ACATGT ATG GAAG GTC  TCCAC  TAAATATA   T
^      A   A    A   TT     TT        AAA
```

mml-miR-513-5

```
           C    A   GG     T       -  GAA
CTGTACATTGC TTTC CAG  AGGTG CATTTAT GT   \
GACATGTAATG GAAG GTC  TTCAC GTAAATA CA   C
           A    A   TT     T       T  AAT
```

age-miR-513-1

```
  -  -|    G   C    A       C  T         GGA
CA GC GTGCA TGC CTTC CAAGGAG TG CATTCATGT   C
GT CG CATGT ATG GAAG GTTCTTC GC GTAAGTACA   A
  A  A^    A   A    A       C  T         AAA
```

age-miR-513-2

```
  - -       G    C    A-|           C           GAA
CA G CGTGCA TGC CTT   CAAGAAGGTG CATTCATGT    C
GT C GCATGT ATG GAA   GTTCTTCCGC GTAAGTATA    T
  A G       A    A    GA^           C           AAA
```

age-miR-513-3

```
  -  -      G    C     A          -| C     A    GGA
CA GC GTGCA TGC CTTC CAAGGAGGT GT ATTC TGT    C
GT CG CATGT ATG GAAG GTTCTTCCG CA TAAG ACA    T
  A  A      A    A     A          T^ -     C    AAA
```

age-miR-513-4

```
  -  -|     G    C                T    T      GAA
CA GC GTGCA TGC TTTCTCAAGAAGGTG CAT CATGT    C
GT CG CATGT ATG GAAGAGTTCTTCCAC GTA GTATA    T
  A  A^     A    A                T    -      AAA
```

age-miR-513-5

```
|     AGC      G    C     A    C       T          AAA
CATTC    GTGCA TGC CTTC CAA GAGGTG CATTTATGT    C
GTAGG    CATGT ATG GAAG GTT TTCCAC GTAAATACA    T
^     A--      A    A     A    T       T          AAG
```

age-miR-513-6

```
   -| AGCA     G    C     -           C           GAA
CAT CC     TGCA TGC CTTA CAAGAAGGTG CATTCATGT    C
GTA GG     ATGT ATG GAAT GTTCTTCCGC GTAAGTATA    T
   C^ C---     A    A     A           C           AAA
```

age-miR-513-7

```
  -  -|     G    CCT  A           T           GGA
CA GC GTGCA TGC    TC CAAGGAGGTG CATTCATGT    C
GT CG CATGT ATG    AG GTTCTTCCGC GTAAGTACA    A
  A  A^     A    AGT  A           C           AAA
```

age-miR-513-8

```
  -  -|    G   C                T         GAA
CA GC GTGCA TGC TTTCTCAAGAAGGTG CATTCATGT   C
GT CG CATGT ATG GAAGAGTTCTTCCGC GTAAGTATA   T
  A  A^    A   A                T         AAA
```

hsa-miR-506

```
|   ACTA  TG  G   C          A     TA    A     T
CCAT    TG  TA TGC TTATTCAGGA GGTGT  CTTA TAGAT A
GGTA    AC  GT ATG GATGAGTCTT CCACG  GAAT GTTTA A
^   CA--  GT  A   A          C     --    -     T
```

ptr-miR-506

```
|   ACTA  TG  G   C          A     TA    A     T
CCAT    TG  TA TGC TTATTCAGGA GGTGT  CTTA TAGAT A
GGTA    AC  GT ATG GATGAGTCTT CCACG  GAAT GTTTA A
^   CA--  GT  A   A          C     --    -     T
```

hsy-miR-506

```
|    CTA  TG  G   C          A     TA    A     T
CCATG   TG  TA TGC TTATTCAGGA GGTGT  CTTA TAGAT A
GGTAC   AC  GT ATG GATGAGTCTT CCACG  GAAT GTTTA A
^    A--  GT  A   A          C     --    -     T
```

rbi-miR-506

```
TGTCTAGTG  TTTA  TG  G   C          A     --   TT     A
         CC    TG  TA TGC TTATTCAGGA GGTGT  TAC  AATGT T
         GG    AC  GT ATG GATGAGTCTT CCACG  ATG  TTACA T
TTTACTATA  TACA  GT  A   A          C     GA   T-     A
```

mml-miR-506

```
TGTCTA   -    TA  TG  G   C          A     --   TT     A
       GTG CCGT  TG  TA TGC TTATTCAGGA GGTGT  TAC  AATAT T
       TAC GGTA  AC  GT ATG GATGAGTCTT CCACG  ATG  TTATA T
 TTTAC-   A    CA  GT  A   A          C     GA   T-     A
```

age-miR-506

```
CA--------  CTC      G   C          A    TTAC    A     T
          CG   TGTATA TAC TTATTCAGGA GGTG    CCAT CAGAT A
          GC   ACGTGT ATG GATGAGTCTT CCGC    GGTA GTTTA A
TTTACACCAG  ACA      A   A          C    ----    A     T
```

hsa-miR-507

```
   -   -|     G  C            A    CAT      GTC
GTG CTG TGTGTA TG TTCACTTCAAGA GTGC   GCATGT   T
CAT GAC ACACGT AT AAGTGAGGTTTT CACG   TGTATA   A
   A   A^     A  A            C    TTT      AAG
```

ptr-miR-507

```
   -   -|     G  C            A    CAT      GTC
GTG CTG TGTGTA TG TTCACTTCAAGA GTGC   GCATGT   T
CAT GAC ACACGT AT AAGTGAGGTTTT CACG   TGTATA   A
   A   A^     A  A            C    TTT      AAG
```

hsy-miR-507

```
   -   -|     G  C          TAA    CATT     GTC
GTG CTG TGTGTA TG TTCACTTCAA   GTGC    CATGT   T
CAT GAC ACACGT AT AAGTGAGGTT   CACG    GTATA   A
   G   A^     A  A          TTC    TTTT     AAG
```

rbi-miR-507

```
   -   -|     G  C          TAA    CATT     GTC
GTG CTG TGTGTA TG TTCACTTCAA   GTGC    CATGT   T
CAT GAC ACACGT AT AAGTGAGGTT   CACG    GTATA   A
   G   A^     A  A          TTC    TTTT     AAG
```

mml-miR-507

```
   -   -|     G  C          TAA    CATT     GTC
GTG CTG TGTGTA TG TTCACTTCAA   GTGC    CATGT   T
CAT GAC ACACGT AT AAGTGAGGTT   CACG    GTATA   A
   G   A^     A  A          TTC    TTTT     AAG
```

age-miR-507

```
   -   -|      G  C       TC  TT        TT  T  GGC
GTG CTG TGTGTA TG TTCACT  AA  AGTGCCA  CA GT   T
CAT GAC ACACGT AT AAGTGA  TT  TCACGGT  GT TA   A
   G   A^      A  A       GA  TT        TT  T  AAG
```

hsa-mir-508

```
   -|    G   C               GT  C      AAA
TGA GTGTA TGC CTACTCCAGAGGGC  CA TCATGT   C
ACT CACAT ATG GATGAGGTTTTCCG  GT AGTACA   T
   A^    A   A               AT  T      AAA
```

ptr-miR-508

```
   -|    G   C      C        AT         AAA
TGA GTGTA TGC CTACTC AGAGGGC  CAGTCATGT   C
ACT CACAT ATG GATGAG TTTTCCG  GTTAGTACA   T
   A^    A   A      T        AT         AAA
```

hsy-miR-508

```
   -|    G   C      C        GT  C   C  AAA
TGA GTGTA TGC CTACTC AGAGGGC  CA TCA GT   C
ACT CACAT ATG GATGAG TTTCCCG  GT AGT CA   T
   A^    A   A      T        AT  T   A  CAA
```

rbi-miR-508

```
   -|    G          C      CGT      CATAAA
TGA GTGTA TGCTCTACTC AGAGGG   CAATCA      C
ACT CACAT ACGAGATGAG TTTTCC   GTTAGT      T
   A^    A          T      ACT      ACAAAA
```

mml-miR-508

```
   -|   CG          C        T  C   CATAAA
TGA GTGT  TGCTCTACTC AGAGGGCG CA TCA      C
ACT CACA  ATGAGATGAG TTTTCCGC GT AGT      T
   A^   TA          T        T  T   ACAAAA
```

age-miR-508

```
|  -     G   C      C        T     ACATAAA
TGA GTGTA TGC CTACTC AGAGGGTG CAATC       C
ACT CACAT ATG GATGAG TTTTCCAC GTTAG       T
^  A     A   A      T        T     CACGAAA
```

hsa-miR-509-pre-2

```
    C   -   TG    C   -|TG     A   G       GTATA
CATG TGT GTG  GTAC CTA C  CAGAC GTG CAATCAT     A
GTGC ACA TAC  CATG GAT G  GTCTG CAT GTTAGTA     T
    -   G   GT    A   G^GT     -   G       AAAAT
```

hsa-miR-509-pre-1

```
    C   -   TG    C   -|TG        G       GTATA
CATG TGT GTG  GTAC CTA C  CAGACGTG CAATCAT     A
GTGC ACA TAC  CATG GAT G  GTCTGCAT GTTAGTA     T
    -   G   GT    A   G^GT        G       AAAAT
```

hsa-miR-509

```
    C   -   TG    C   -|TG     A   G       GTATA
CATG TGT GTG  GTAC CTA C  CAGAC GTG CAATCAT     A
GTAC ACA TAC  CATG GAT G  GTCTG CAT GTTAGTA     T
    -   G   GT    A   G^GT     -   G       AAAAT
```

ptr-miR-509-1

```
    C   -   TG    C   -|TG     A   G       GTATA
CATG TGT GTG  GTAC CTA C  CAGAC GTG CAATCAT     A
GTAC ACA TAC  CATG GAT G  GTCTG CAT GTTAGTA     T
    -   G   GT    A   A^GT     -   G       AAAAT
```

ptr-miR-509-2

```
    C   -   TG    C     -|        G       GTATA
CGTG TGT GTG  GTAC CTACT GCAGACGTG CAATCAT     A
GTAC ACA TAC  CATG GATGA TGTCTGCAT GTTAGTA     T
    -   G   GT    A     G^        G       AAAAT
```

ptr-miR-509-3

```
    C   -   TG    C   -|TG     A   G       GTATA
CATG TGT GTG  GTAC CTA C  CAGAC GTG CAATCAT     A
GTAC ACA TAC  CATG GAT G  GTCTG CAT GTTAGTA     T
    -   G   GT    A   A^GT     -   G       AAAAT
```

hsy-miR-509-1

```
    C   -   TG    C   -|       A   G       GTATA
CATG TGT GTG  GTAC CTA CTACAGGC GTG CAATCAT     A
GTAC ACA TAC  CATG GAT GGTGTCTG CAT GTTAGTA     T
    -   G   GT    A   G^        -   G       AAAAT
```

hsy-miR-509-2

```
    C   -   TG    C   -|       A   G       GTATA
CATG TGT GTG  GTAC CTA CTGCAGGC GTG CAATCAT     A
GTAC ACA TAC  CATG GAT GATGTCTG CAT GTTAGTA     T
    -   G   GT    A   G^        -   G       AAAAT
```

rbi-miR-509

```
    C   -    GG   C      -     A   G     CTG--| T
CATG TGT GTGT  TAC CTACTT CAGGC GTG CAATC     TA A
GTAC ACA TACG  ATG GATGGG GTCTG CAT GTTAG     AT G
    -   G    TA   A      T     -   A     TAAAA^ T
```

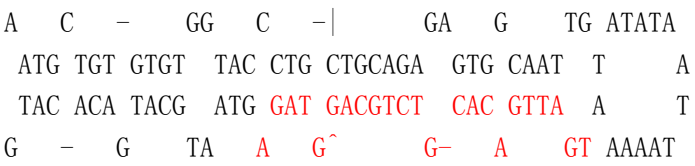
mml-miR-509-1

```
    T   -    GG   C   -|TG      G  G       GTATA
CATG TGT GTGT  TAC CTA C  CAGGCA TG CAATTAT     G
GTAC ACA TACG  ATG GAT G  GTCTGT AT GTTAGTA     T
    -   G    TA   A   G^GT      -  G       AAAAT
```

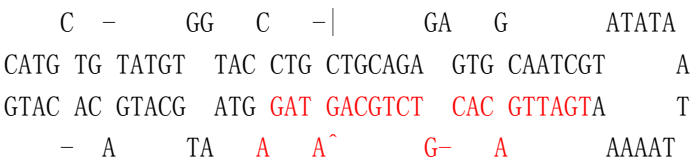
mml-miR-509-2

```
    C   -    GG   C   -|        G  G       GTATA
CATG TGT GTGT  TAC CTA CTACAGGCA TG CAATCAT     G
GTAC ACA TACG  ATG GAT GGTGTCTGT AT GTTAGTA     T
    -   G    TA   A   G^        -  G       AAAAT
```

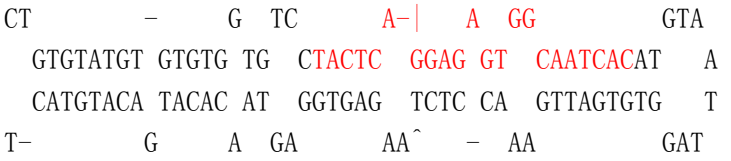
age-miR-509-1



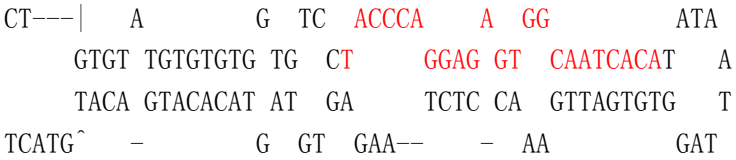
age-miR-509-2



hsa-miR-510



ptr-miR-510



hsy-miR-510

rbi-miR-510

mml-miR-510

```
TGC  TG   -     G  TC      C-|   A  GG         ATA
   TG  TGT GTGTG TA  CTACTC  GGAG GT  CAATCACAT   A
   AT  ACA TACAC AT  GGTGAG  TCTC CA  GTTAGTGTG   T
TC-  GT   G     A  GA      AA^   -  AA         AAT
```

age-miR-510

```
GC--      -      G          -|    A  AG       GTATA
    TATATG CGTGTG TGCTCTACTC CAGAG GT  CAATCAC     A
    ATGTAC GTACAC ATGAGATGAG GTCTC CA  GTTAGTG     T
CATC      A      A          A^    -  AA       GAAAT
```

hsa-miR-514-1

```
   T    -    G   C      -|   G    A      T  ATA
ATG TGTC TGTG TAC CTACTC TGGA AGTG CAATCA GT   A
TGC ACAG ACGC ATG GATGAG GTCT TCAC GTTAGT TA   T
   -    T    A   A      T^   -    A      T  AAT
```

hsa-miR-514-2

```
ATGT    -    G   C      -|   G    A      T  ATA
    TGTC TGTG TAC CTACTC TGGA AGTG CAATCA GT   A
    ACAG ACGC ATG GATGAG GTCT TCAC GTTAGT TA   C
TTC-    T    A   A      T^   -    A      T  AAT
```

hsa-miR-514-3

```
ATGT    -    G   C      -|   G    A      T  ATA
    TGTC TGTG TAC CTACTC TGGA AGTG CAATCA GT   A
    ACAG ACGC ATG GATGAG GTCT TCAC GTTAGT TA   C
TTC-    T    A   A      T^   -    A      T  AAT
```

ptr-miR-514-1

```
    -    G   C      -|    A   A      T  ATA
TGTC TGTG TAC CTACTC TGGAA GTG CAATCA GT   A
ACAG ACGC ATG GATGAG GTCTT CAC GTTAGT TA   T
    T    A   A      T^    -   A      T  AAT
```

ptr-miR-514-2

```
     TC    G   C       -    G    A       T  ATA
TGTTG  TGTG TAC CTACTC TGGA AGTG CAATCA GT   A
ACAGT  ACGC ATG GATGAG GTCT TCAC GTTAGT TA   C
     --    A   A       T    -    A       T  AAT
```

ptr-miR-514-3

```
    -    G   C       -|   G    A       T  ATA
TGTC TGTG TAC CTACTC TGGA AGTG CAATCA GT   A
ACAG ACGC ATG GATGAG GTCT TCAC GTTAGT TA   C
    T    A   A       T^   -    A       T  AAT
```

ptr-miR-514-4

```
    T-   G   C       -|   G    A       T  ATA
TGTC  GTG TAC CTACTC TGGA AGTG CAATCA GT   A
ACAG  CGC ATG GATGAG GTCT TCAC GTTAGT TA   C
    TC   A   A       T^   -    A       T  AAT
```

hsy-miR-514

```
   T    -    G   C       -|   T    A       T  GTA
ATG TGTC TGTG TAC CTACTC TGGA AGTG CAATCA GT   A
TGC ACAG ACGC ATG GATGAG GTCT TCAC GTTAGT TA   T
   -    T    A   A       T^   -    A       T  AAT
```

rbi-miR-514

```
   T    -    G   C       -|   G    A       T  ATA
ATG TGTC TGTG TAC CTACTC TGGA AGTG CAATCA GT   A
TGC ACAG ATGC ATG GATGAG GTCT TCAC GTTAGT TA   T
   -    T    A   A       T^   -    A       T  AAT
```

mml-miR-514

```
   T    -   GG   C       -|   G    A       T  ATA
ATG TGTC TGT  TAC CTACTC TGGA AGTG CAATCA GT   A
TGC ACAG ACG  ATG GATGAG GTCT TCAC GTTAGT TA   T
   -    T   TA   A       T^   -    A       T  AAT
```

age-miR-514

```
| A     T   GG   C      CG              TG-  TA
CA GTTGT TGT  TAC CTACTC  AAGAGTGTCAaTCA   TG  \
GT CAGCA ACA  ATG GATGAG  TTTTCACAGTTAGT   AC  A
^ A     T   --   A      TG              TTA  TT
```

hsa-miR-510L

```
----------  G      T    -|    GAGG         GTA
           TG TACTCT CTCA AGAGG    CAATCATGT   A
           AC ATGAGG GAGT TCTCC    GTTAGTATA   T
ATATATAGTAC  A      T    G^    ACA-         GAT
```

ptr-miR-510L

```
----------  G      T    -|    GAGG         GTA
           TG TACTCT CTCA AGAGG    CAATCATGT   A
           AC ATGAGG GAGT TCTCC    GTTAGTATA   T
ATATATAGTAC  A      T    G^    ACA-         GAT
```

hsy-miR-510L

```
----------  G      T   -|     GAGG         GTA
           TG TACTCT CTC AAGAGG    CAATCATGT   A
           AC ATGAGG GAG TTCTCC    GTTAGTATA   T
ATATATAGTAC  A      T   T^     ACA-         GAT
```

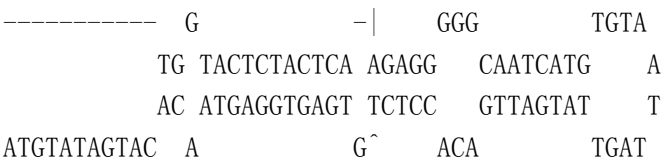
rbi-miR-510L

```
----------  G      T    -|    GAGG         GTA
           TG TACTCT CTCA AGAGG    CAATCATGT   A
           AC ATGAGA GAGT TCTCC    GTTAGTATA   T
CTTTATGGTAC  A      T    G^    ACA-         GAT
```

mml-miR-510L

```
----------  G      T    -|    GAGG         GTA
           TG TACTCT CTCA AGAGG    CAATCATGT   A
           AC ATGAGA GAGT TCTCC    GTTAGTATA   T
CTTTATGGTAC  A      T    G^    ACA-         GAT
```

age-miR-510L


G
GGG
TGTA
TG TACTCTACTCA AGAGG
CAATCATG
A
AC ATGAGGTGAGT TCTCC
GTTAGTAT
T
ATGTATAGTAC A
G
ACA
TGAT

Supplemental Table 1. Primers used for BAC screening, precursor expression analysis, miR-509 copy number detection.

Name	Sequence (5'-3')
Siamang and YGM	
forward primer	GAGGGCGTCACTCATGTAAACTAA
reverse primer	GAGCTTTTTGGTGCAGAGGGAT
Spider monkey	
forward primer	CCCCTCACTATGCCATTTCA
reverse primer	AGCCAAGGCCCACAGGAT
Precursor analysis	
GS-pre-miR-509	CCTGACTGACTGGGGCAAGATAAAATACCTGCACT
GS-pre-miR-513	CCTGACTGACTGGGGCAAGAGCATCACCATGCTCGC
Adaptor	CCTGACTGACTGGGGCAAGA
pre-mml-miR-513	TKGGTCTGGGATGCCACAYYC
pre-mml-miR-509	AGAAGTCCTTTGTCCAAATTCCA
forward primer for miR-509 copy number	CTCAGCATTATTCACAATTCCTG
reverse primer for miR-509 copy number	ATGCTTTGCAAGTAGCAATGTG

The GS-primers were used for reverse transcription of the precursors. Adaptor was used for avoiding genomic DNA contamination.

Supplemental Table 2. Single substitutions observed in the precursors of within species paralog miRNAs

Type of substitution	hsa-miR-513	ptr-miR-513	hsy-miR-513	rbi-miR-513	mml-miR-513
Single					
Base pairing to base pairing	3	2	1	3	4
Base pairing to non-base pairing	3	4	5	2	4

Type of substitution	age-miR-513	ptr-miR-509	hsy-miR-509	hsa-(mml-) (age-) miR-509
Single				
Base pairing to base pairing	8	1	2	1
Base pairing to non-base pairing	9	3	0	1

Type of substitution	hsa-miR-514	ptr-miR-514
Single		
Base pairing to base pairing	0	0
Base pairing to non-base pairing	0	2

Supplemental Table 3. Primers used in real-time RT-PCR analysis

Name	Sequence (5'-3')
Universal primers	
GS primer tail 1	CCTGACTGACTGGGGCAAGA
GS primer tail 2	CCACTCCGTTCATCTGGTCA
miRNAs templates	
mml-miR-513-1	TTCACAAGGAGGTGTCATTTAT
mml-miR-513-3	TTCACAGGGAGGTGTCATTTAT
mml-miR-506	TAAGGCACCCTTCTGAGTAGA
mml-miR-507	TTTTGCACCTTTTGGAGTGAA
mml-miR-508	TGATTGTCGCCTTTTTGAGTAGA
mml-miR-509	TGATTGGTATGTCTGTGGGTAGA
mml-miR-510	TACTCCGGAGAGTGGCAATCACA
mml-miR-514	ATTGACACTTCTGTGAGTAG
GS-primers	
gs-miR-513	CCTGACTGACTGGGGCAAGAATAAATGACACC
gs-miR-506	CCTGACTGACTGGGGCAAGATCTACTCAGAAG
gs-miR-507	CCACTCCGTTCATCTGGTCATTCACTCCAAAA
gs-miR-508	CCACTCCGTTCATCTGGTCATCTACTCAAAAA
gs-miR-509	CCACTCCGTTCATCTGGTCATCTACCCACAGA
gs-miR-510	CCACTCCGTTCATCTGGTCATGTGATTGCCAC
gs-miR-514	CCACTCCGTTCATCTGGTCACTACTCACAGAA
LNA-R primers	LNA substitutions are preceded by a ‘‘+’’
miR-513	T+TC+ACA RGG AGGTGT
miR-506	TA+AGGC+ACCCTTCTG
miR-507	TT+TT+GC+ACCTTTTGG
miR-508	TG+AT+TGTCGCCTTTTT
miR-509	TG+AT+TGG+TATGTCTG
miR-510	T+ACTCCGGAGAGTGG
miR-514	AT+TG+AC+ACTTCTGTG