

Additional file 3 - The predicted hairpin structures of all the 29 new miRNAs/ new members of known miRNA families' precursors. The mature miRNA and miRNA* sequences are colored in red and blue, respectively.

miR5213

```

          10          20          30          40          50          60
UCUUA--|      U      UU-  A          U  C          CUAU  UAUU  UU  A    U
      GGCUAG GAAA  GAU CGUGUGUCU CAC UCUGAA  CAA  AUG  UC AAUC \
      UCGAUC CUUU  CUA GCACAUAGA GUG AGACUU  GUU  UAC  AG UUAG U
UUAUCCA^      -      UCU  C          C  -      C---  UUCU  UU  C    U
          120          110          100          90          80          70

```

miR5274b

```

          10          20          30          40
-|      CG          A      GA  UA
GCGUUC  CAUAUAGACGGAGUGUAAAUGCCUA GUAUCA  CU  C
CGCAAG  GUUAUACUGCCUCACAUUUACGGAU CAUAGU  GA  C
A^      AU          A      UC  UA
          90          80          70          60          50

```

miR5554a

```

          10          20          30          40          50
-      G      U      UG  A          G      -|  CA
CAGCAU CGAUG GCAUCU  AAC AUGGUAUUAAGU UCAAGA AAUG \
GUUGUA GCUAC CGUAGA  UUG UACCAUAAGUUA AGUUUU UUAC  C
G      G      U      CG  C          A      C^  UC
          100          90          80          70          60

```

miR5554b

```

      10      20      30      40      50
CA-   G      U      UG  A      -|      CA
      GCAU CGAUG GCAUCU AAC AUGGUAU UCAAGUGUC AAGGAAUG \
      UGUA GCUAC CGUAGA UUG UACCAUAAGUUCACAG UUUCUUAC  C
GGC   G      U      CG  C      U^      UC
      100      90      80      70      60
```

miR5554c

```

      10      20      30      40      50
CA-   G      U      UG  A      -|      CA
      ACAU UGAUG GCAUCU AAC AUGGUAU UCAAGUGUC AAGGAAUG \
      UGUA GCUAC CGUAGA UUG UACCAUAAGUUCACAG UUUCUUAC  C
GGC   A      U      CG  C      U^      UC
      100      90      80      70      60
```

miR5555

```

      10      20      30      40
UAC           A      ---  -|  UU
      AUGUAUCUAAAGAGU UAAUAUGACUUUGAUUAUG  ACA CAC  \
      UACAUAGAUAUCUCA AUUAUGCUGAAGCUAAUAC  UGU GUG  U
AAC           C      CGU  A^  AG
      90      80      70      60      50
```

miR5556

1020304050

GU A C C C A AA -----| C A

CAAGAUCAUUUGGA UUCUCCG CAUC AA GAACCUU GAG CAG CUC AC A

GUUCUAGUAAACCU AAGAAGGC GUAG UU CUUGGAA CUC GUU GAG UG U

UU A A U A C CA CCUCA^ U A

110 100 90 80 70 60

miR5557

10203040

C C C .-A| C

AGGACA UU UCAAACAAGUACUAAGGAAGCACAAUCAG AAGUAA U

UUCUGU AA AGUUGUUGAUGAUUCCUUCGUGUUGGUU UUCAUU C

- C U \ -^ U

310 300 290 280 50

60708090100

----- CC .-UU CA-- CAU CCU .-CUUC UCA

UGUUGUG CA CAGUG UUUAGC CAA CUC UGAACA \
 AUAUAC GU GUCAC AAGUUG GUU GAG ACUUGU C

GAAGAAAUAAAGCUUUUGACU UU \
 270 260 250 200 190 110

120130140150

CUACU UU- CA GUUUC AUC

GAU CAAAU UCUCUUU ACAAG A

CUA GUUUG AGAGAAA UGUUU U

U----- UGU -- ----- AAC

180 170 160

210220

UCAA UU CU

UUUGGG AGUGUA \
 GAAUCC UCACGU C

UC-- -- UU

240

miR5558

```

      10      20      30      40
U|   CAUA      C      CCUAU      C
GACCU      UUUUC AAUUCUAAGUCUAUC      GAAUUC A
CUGGA      AAAAG UUAAGAUUUAGAUAG      CUUAAG A
C^   AUCG      A      AGC--      U
      80      70      60      50

```

miR5559

```

      10      20      30      40
UAUU      U      A      .-A|      CAA
UCCUUUUAACUUGGUGAAU GUUGGAUC UUCUGU      UCAAU \
AGGA AAAUGAACCAUUA UAAUCUAG AAGACA      AGUUA      C
GCAU      U      C      \ -^      CAC
      130      120      110      50
      60
      AG--      .-A      AU
      CUUC      UGU      \
      GAAG      ACA      A
      CAAA      \ -      GA
      100      70
      80
      A--      UCAA
      GA      C
      CU      G
      AAA      UAUA
      90

```

miR5560

```

      10      20      30      40      50
A      C      C      -      CUC      -|      C      A      G
  GUCGG AAU CUCU CAUUA  AGCCGGUACAUCAU UGGU GUUGGA UUU A
  CAGUC UUA GAGG GUAAGU  UCGGCCGU GUAGUA AUCA CAACCU GGA U
-      U      A      C      AAC      C^      A      A      C
110      100      90      80      70      60

```

miR5561

```

      10      20      30      40
-|      A      C      AA      U      G
  UGGA ACUUUCAUUUGGAGAGA AUAGACA  UGAAAU AAAU A
  ACCU UGAAGGUAAAUCUCUCU UAUCUGU  ACUUUA UUUA U
U^      G      C      A-      -      A
      80      70      60      50

```

miR5562

1020304050

AUAAAACA GG GA -- .-AAUGGGA| G

GUUGU AGUCUUUU CAUG AGUUUCU UGCUG CGGUG C

CAACG UCGGAAGA GUGU UCAAAGA ACGAU GCCAU A

UCAUACUC -- GA AA \ -----^ A

22021020019060

708090100

AAAUG- CAAAG .-G .-AAACAACGAGAAAA GGG

GAAUCGUU AUUG UCCA GCAU \

CUUAGCGA UAAC AGGU UGUA A

AACGAA AUUA- \ - \ ----- AGA

180170

120

GAG GC

GGUU \

UCAA A

A-- AA

130

140150

UUUGA UGG

GAAU A

CUUG A

AA--- UUU

160

miR5563

10203040

- UUA C AC---| CA

CAAUU AAUGAUU AGGCAACUCGGUCCUUCUGUUA UUGGC \

GUUAA UUGCUGUA UCCGUUGAGUCAGGAAGGCAAU AACUG A

G UAC A GACCA^ UC

9080706050

miR 2592a

```

      10      20      30      40      50      60      70      80      90
G   C          C          -|          GAA          G   C          AAU          C   U   C   U   A   AG
   UCA GCAUUUCGC CGGCAUUAUG UUUUCCUUUGAAAAA   UAAAAUUUUGUUAGGU UG UUUAGAU   GGUAUU AA UG CAA GAA UG \
   AGU CGUAAA GCG GCUGUAAGUAC AAAAGGAAACUUUU   AUUUAAGAACA AUCCA AC AAAUCUA   CCAUAA UU AC GUU CUU AC G
-   U          A          A^          AUG          -   C          CUU          -   C   A   C   -   UU
      190      180      170      160      150      140      130      120      110      100
```

miR 2592bl

```

      10      20      30      40      50      60
AG|          U   CU          A   UAA          U          G
   UUGUUGUU UGGCAAGUUUGAAU AC CAUUCA AGG   GAUAAUUGUU UAGUUGGAAG U
   GACGGC AAAUUGUUC AAACUUA UG GUAGGU UCC   CUGUUAACAA AUCAACCUUC G
AG^          -   AG          C   UC-          C          C
      120      110      100      90      80      70
```

miR2592bm

```

      10      20      30      40      50      60      70      80      90
C          U          U          C          G   GA-          AU   -|          UG          A
   UCAAGCAUUUCG CUCGGCAUUAUG UUUUCCUUUGAAAAGA UAAAUU UUGUUA GUU   UUUAGAUGA   GUA UUAAGUGUCAAA AAUGA \
   AGUUCGUAAA GUGGGCUGUAAGUAC AAAAGGAAACUUUUCU AUUUA AACGAU CGA   AAAUCUACU   UAU AGUUCACGGUU   UUAUU C
-          -          U          A          G   ACA          AC   A^          GU          C
      190      180      170      160      150      140      130      120      110      100
```

miR2592bn

```

      10      20      30      40      50      60      70      80      90
C      U      UAU      C      - G      A      -      -|      AA
UCGAGCAUUCGCUCUGGCAUUCAUG UUUUCCUUUGAAAA      UAAAAU UUGUUGGGU UG UUUAGAUGA GGUA UUAAGUGUCA GAAAUG \
AGUUCGUAAAGUGGGCUGAAGUAC AAAAGGAAACUUUU      AUUUAA AACAAUCCA AC AAAUCUACU CCAU AGUUCACGGUU CUUAC C
-      CUU      A      C G      A      A      G^      UC
      190      180      170      160      150      140      130      120      110      100

```

miR2619b

```

      10      20      30      40      50      60      70      80
AAA|      A      U      GC      . -AGGCAAAAUAAAAAUAAAAAUUUGACACA      CA
CAGCCCC UAUGU UUGAUUCUUUGGCAGUUUUG      CCCCCA      UGGCACCU C
GUCGGGG AUACA AACUAAGAAACCGUCAAAAC      GGGGGU      ACCGUGGG U
UUA^      G      U      UU      \ -----      AU
      160      150      140      130      90
      100      110
      CG      C      C
      UCAG GUUGAC \
      AGUC CAACUG G
      CA      A      A
      120

```

miR156j

```

      10      20      30      40      50      60
--|      G UG      A      A-      A      GG      A      GUCUUUA      UAA
CUGUU U      GG CAU      GAAAUUG CAGAAGAG UGAGCACA AAAAA      GUAUA \
GAUAA A      UC GUA      UUUUAAC GUCUUCUC ACUCGUGU UUUUU      CAUAU U
GU^      - GU      -      AC      A      AU      G      AUUAC--      UUG
      120      110      100      90      80      70

```


miR167b

	10	20	30	40	50	60	70	80	90	100	110	
CAA	U	G		G U	UUCCUGUGU	U	UAAU	CUGA	C	A A	U	UAA
	UGACAG	UGAAGCU	CCAGCAUGAUCUGU	CUU CC		AUA ACUU	UUCCAG	AUUUAAAAUAAA	CAAAAA	AUA AUA	GUUUGGUC	A
	AUUGUC	ACUUCGA	GGUUGUACUAGACA	GAA GG		UAU UGAG	GGGGUC	UGAAUUUGUAUU	GUUUUU	UAU UAU	CAAACUAG	U
UAA^	C	-		A U	UGUU-----	U	U---	----	C	A A	U	UUU
	200	190	180	170	160	150	140	130	120			

miR168c

	10	20	30	40	50	60
C----	UU	UA	C	U	A	CUA U U G
UCAC	CGCGGUCUC	AU	UCG UUGGUGCAGG	CGGGA	CCA	CA CCGCUG UUUC \
AGUG	GCGCCGGAG	UAAGU	AACUACGUUC	GCCCU	GGU	GU GGCGGC AAAG U
AUCUA^	--	GC	C	C	A	UAA - C A
120	110	100	90	80	70	

miR172b

	10	20	30	40	50	
CAC--	UGUUU	A		.-AUAUGUGAAUGAU	AGU	
	AGUCGU	GC	GAU	GUAGCAUCAAGAUC	GCAG	\
	UCAGCA	CG	CUACGUCGUAGUAGUUCUAAG		CGUC	G
AUAUU	UAUAC	A		\ -----^	AAG	
130	120	110	100			60

miR172c

10203040506070

UUAUUU A A UA-| U AA UUUUG UG UG

GC GAUGUAGCAUCAAGAUAUC CA UGAAAG GC AUGG UUGGAUUU AUC \

CG CUACGUCGUAGUAGUUCUAAG GU GUUUUC UG UACC AAUCUAAA UAG A

AAAUAC A A CAA^ - GA UCUUG CG CU

1301201101009080

7080

UAA UUG

UAUUUCAA A

AUAAAGUU U

A-- UUC

90

miR408

102030405060

UAGU U ACA-| A CAU A GA AAA U GAA

UAA GACAGG AAG CAGGGAA GCAG GCAUG UG CUA CGACAGU \

AUU UUGUCU UUC GUCCCUU CGUC CGUAC AC GGU GUUGUCA G

UAUU U AAUA^ G CUC A UC CUC - AAG

120110100908070

miR211u

1020304050

- U UC UG - AGU-| GU A CUU

AAGGA AGGGUAAUCUGCA C AGGUUUAG AACAAU UG UA UUUC A

UUCCU UUCUAUUAGACGU G UCCGAUC UUGUUA GC AU AAAG A

A U GA GU U AUGC^ UG A AAA

11010090807060

miR2111v

1020304050

UA- C AU- C UG -| ACC U

UAUUGG GAU AG GAGAUAAUCUGCAU C AGGUUUAGA ACA GA G

GUAACC CUA UC CUCUAUUAGACGUA G UCCGAAUCU UGU CU C

AC A U CUU A GU G^ CA- G

10090807060

miR2643b

1020304050

CUC---| U CC AU C U UUA A CAU

UGC AGU UUGA UCUCUAAU UCUG UCCCAA CACUU AUC G

ACG UCA AACU AGAGAUUA AGAC AGGGUU GUGAA UAG A

AGAUCA^ U U- AU A U UGA C AAA

10090807060

miR4414a

1020304050

GUAGAA-- AG CU G AC U AU U -----| GC

GAUGGCUG A CAGCU CUG UCGUUGG UCA AGC CACA ACAU \

CUGCUGAC U GUCGA GGC AGCAACC AGU UCG GUGU UGUG A

UACUGUCA CU AC G GU U CU U GCAAC^ AU

12011010090807060