

Supplementary Table 1. Human miRNA loci identified as repetitive.

All currently annotated human miRNA loci (<http://microrna.sanger.ac.uk/sequences/index.shtml>), were screened against Repbase using Censor Server (<http://www.girinst.org/censor/>). Only mature miRNAs entirely contained within a Censor Server consensus repetitive element annotation have been reported. All repetitive elements (grey rectangles) occurring within 500 bp (5' and 3') have been included in the following scale diagrams for uniformity. The RepBase repetitive element annotations depicted in these diagrams are described immediately beneath each locus as "Element 1, Element 2, etc..." as they occur 5' to 3'. For clarity, all RepBase annotations for mammalian-wide interspersed repeats (MIRs) have been changed to "MWIRs". "Base Positions" refers to the basepairs occupied by a miRNA hairpin (in the current NCBI 36 assembly). All loci have been diagrammed with respect to the Watson strand and the orientation of internal elements indicated by position above (5' to 3') or below (3' to 5') the center line. Element base pair positions are in respect to the first nucleotide of the pre-miRNA (as occurring on the Watson strand).

Supplementary Table 1 footnotes:

^a Previously described by Smalheiser, NR and VI Torvik.

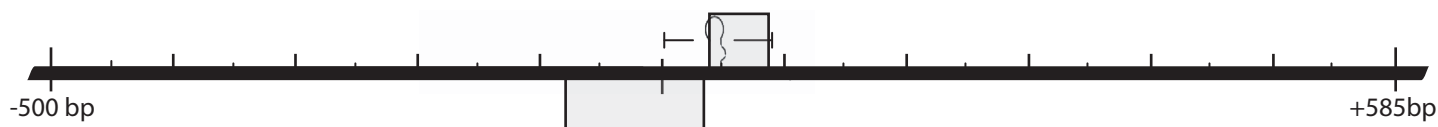
^b Annotated by ENSEMBL based on rno-miR-374.

^c Annotated by ENSEMBL based on rno-miR-297

References

1. E. Birney, *et al.*, *Ensembl.Nucleic Acids Res.* **34**, D556-D561 (2006)
2. Pavlicek, A., Kohany, O., Jurka, J. Repeat mining: basic tools for detection and analysis. In *Analytical tools for DNA, genes and genomes nuts and bolts.* (Markoff, A., ed). DNA Press, Eagleville (2005).
3. Jurka, J. *et. al.* Repbase Update, a database of eukaryotic repetitive elements. *Cytogenetic and Genome Research* **110**, 462-467 (2005). (description of new version of CENSOR)
4. Jurka, J. Repbase Update: a database and an electronic journal of repetitive elements. *Trends Genet.* **9**,418-420 (2000).
5. Smalheiser, NR and VI Torvik. "Mammalian microRNAs derived from genomic repeats." *Trends Genet.* **21**,322-6 (2005).

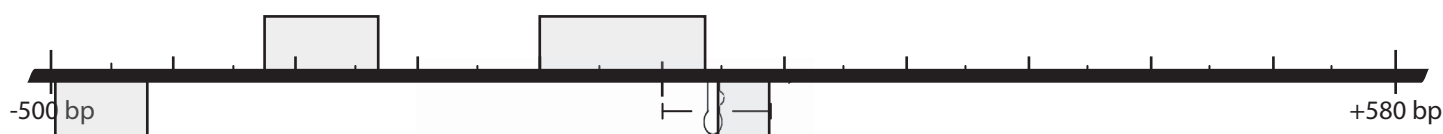
miR-28^a



Chromosomal Band: 3q28
Base Positions: 189889263-189889348
ENSEMBL Gene: ENSG00000207651
Concurrent Transcripts: LPP Intron

Censor Server Annotations (bp 5' to 3') :
Element 1: LINE2B (-67 to +35)
Element 2: LINE2B (+43 to +86)

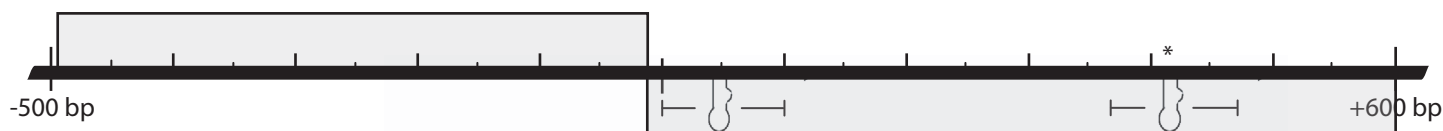
miR-95^a



Chromosomal Band: 4p16.1
Base Positions: 8057928-8058008
ENSEMBL Gene: ENSG00000207807
Concurrent Transcripts: ABLIM2 Intron

Censor Server Annotations (bp 5' to 3') :
Element 1: MER20B (-496 to -424)
Element 2: LINE2B (-327 to -239)
Element 3: LINE2B (-101 to +35)
Element 4: LINE2A (+48 to +80)

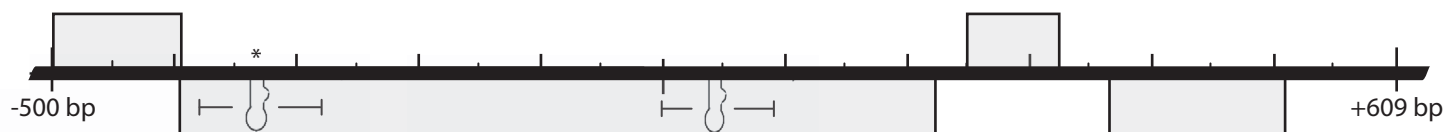
miR-132



Chromosomal Band: 17p13.3
Base Positions: 1899952-1900052
ENSEMBL Gene: ENSG00000207724
Concurrent Transcripts: * miR-212

Censor Server Annotations (bp 5' to 3') :
Element 1: MERMITEA (-491 to -9)
Element 2: MERMITEA (-10 to +600)

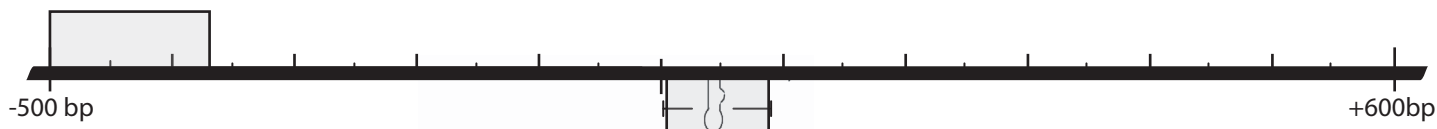
miR-212



Chromosomal Band: 17p13.3
Base Positions: 1900315-1900424
ENSEMBL Gene: ENSG00000207953
Concurrent Transcripts: * miR-132

Censor Server Annotations (bp 5' to 3') :
Element 1: MERMITEA (-500 to -395)
Element 2: MERMITEA (-394 to +230)
Element 2: Gypsy-9-I (+249 to +324)
Element 2: RETROSAT2 (+365 to +507)

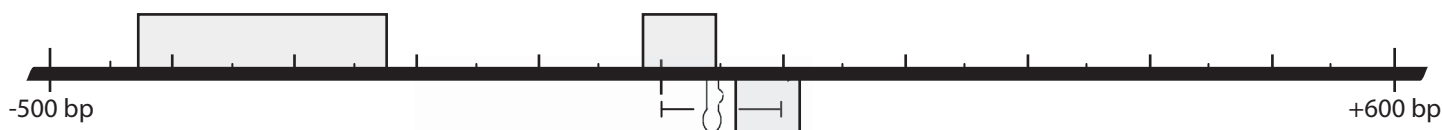
miR-224



Chromosomal Band: Xq28
Base Positions: 150877706-150877786
ENSEMBL Gene: ENSG00000207621
Concurrent Transcripts: GBRE Intron

Censor Server Annotations (bp 5' to 3') :
Element 1: LINE3 (-500 to -370)
Element 2: MER135 (+4 to +78)

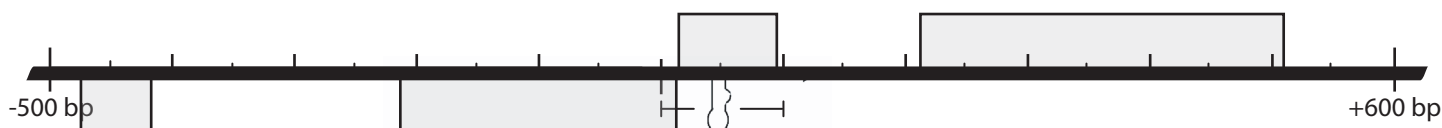
miR-325^a



Chromosomal Band: Xq21.1
Base Positions: 76142220-76142317
ENSEMBL Gene: ENSG00000207995
Concurrent Transcripts: n

Censor Server Annotations (bp 5' to 3') :
Element 1: LINE2A (-436 to -221)
Element 2: LINE2B (-13 to +45)
Element 3: LINE2B (+57 to +110)

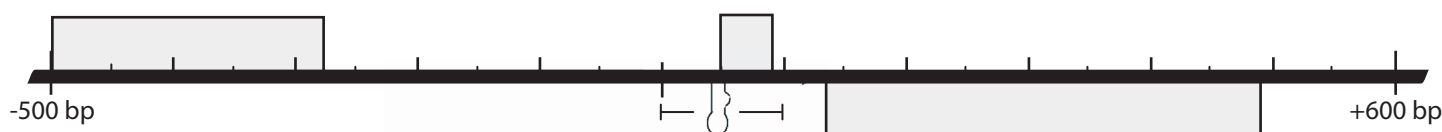
miR-326



Chromosomal Band: 11q13.4
Base Positions: 74723784-74723878
ENSEMBL Gene: ENSG00000199090
Concurrent Transcripts: ARRB1 Intron

Censor Server Annotations (bp 5' to 3') :
Element 1: MWIRb (-472 to -413)
Element 2: MER69 (-307 to +12)
Element 3: SINEB2 (+14 to +99)
Element 4: AluJo (+212 to +512)

miR-340^a



Chromosomal Band: 5q35.3
Base Positions: 179374909-179375003
ENSEMBL Gene: ENSG00000198995
Concurrent Transcripts: RNF130 Intron

Censor Server Annotations (bp 5' to 3') :
Element 1: AluJb (-500 to -291)
Element 2: MARNA (+50 to +87)
Element 3: ERV18 (+136 to +483)

miR-374



Chromosomal Band: Xq13.2
Base Positions: 73423846-73423917
ENSEMBL Gene: ENSG00000199168
Concurrent Transcripts: * miR-545, Hs.349570 Intron

Censor Server Annotations (bp 5' to 3') :
Element 1: AluJo (-500 to -367)
Element 2: LINE2A (-127 to +39)
Element 2: LINE1 (+290 to +359)

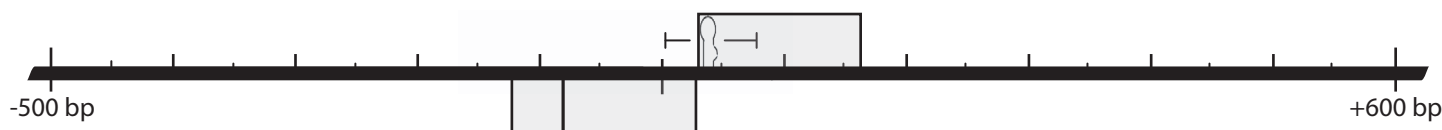
miR-545



Chromosomal Band: Xq13.2
Base Positions: 73423664-73423769
ENSEMBL Gene: ENSG00000207820
Concurrent Transcripts: * miR-374, Hs.349570 Intron

Censor Server Annotations (bp 5' to 3') :
Element 1: AluJo (-500 to -259)
Element 2: LINE2A (+55 to +221)
Element 2: LINE1 (+472 to +541)

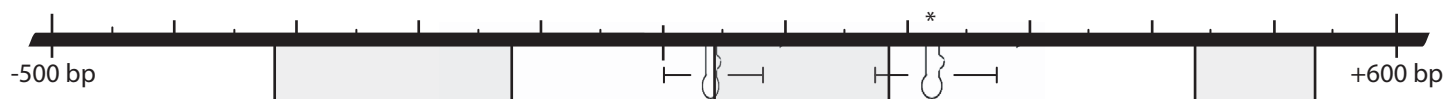
miR-378/miR-422b



Chromosomal Band: 5q32
Base Positions: ENSG00000199047
ENSEMBL Gene: 149092581-149092646
Concurrent Transcripts: PPARGC1B Intron

Censor Server Annotations (bp 5' to 3') :
Element 1: THER2 (-120 to -87)
Element 2: MWIR3 (-86 to +29)
Element 3: MWIRb (+33 to +160)

miR-421



Chromosomal Band: Xq13.2
Base Positions: 73354937-73355021
ENSEMBL Gene: ENSG00000202566
Concurrent Transcripts: *miR-374-2^b ENSG00000208026

Censor Server Annotations (bp 5' to 3') :
Element 1: MER117 (-320 to -122)
Element 2: LINE2B (+49 to +188)
Element 3: MWIRb (+443 to +534)

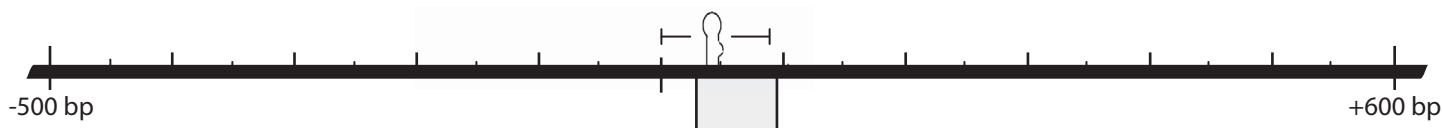
miR-422a



Chromosomal Band: 15q22.31
Base Positions: 61950182-61950271
ENSEMBL Gene: ENSG00000199156
Concurrent Transcripts: -

Censor Server Annotations (bp 5' to 3') :
Element 1: THER2 (-54 to +90)
Element 2: MWIR (+222 to +322)
Element 3: LINE2B (+367 to +488)

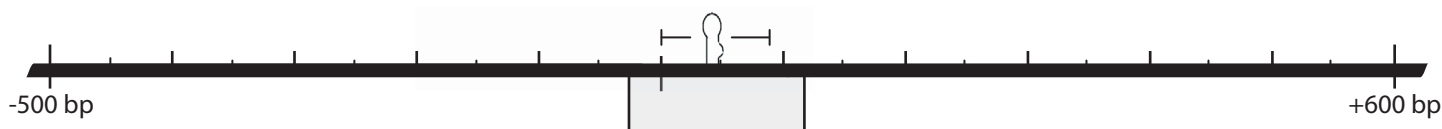
miR-493



Chromosomal Band: 14q32.31
Base Positions: 100405150-100405238
ENSEMBL Gene: ENSG00000207989
Concurrent Transcripts: Chr.14 miR cluster

Censor Server Annotations (bp 5' to 3') :
Element 1: LINE2B (+32 to +91)

miR-544

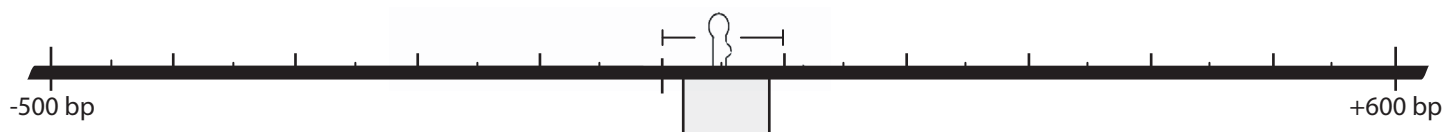


Chromosomal Band: 14q32.31
Base Positions: 100584748-100584838
ENSEMBL Gene: ENSG00000207587
Concurrent Transcripts: Chr.14 miR cluster

Censor Server Annotations (bp 5' to 3') :
Element 1: MER5A1 (-29 to +114)

miR-545 - see miR-374

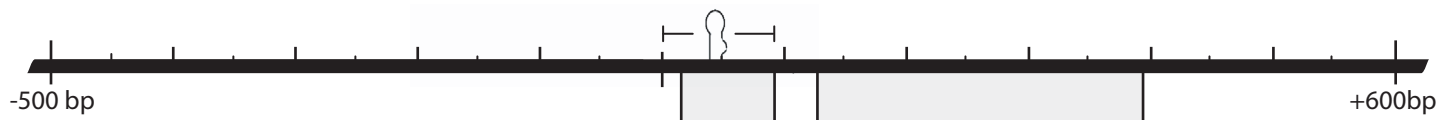
miR-548a-1



Chromosomal Band: 6p22.3
Base Positions: 18679994-18680090
ENSEMBL Gene: ENSG00000207775
Concurrent Transcripts: -

Censor Server Annotations (bp 5' to 3') :
Element 1: MADE1 (+13 to +87)

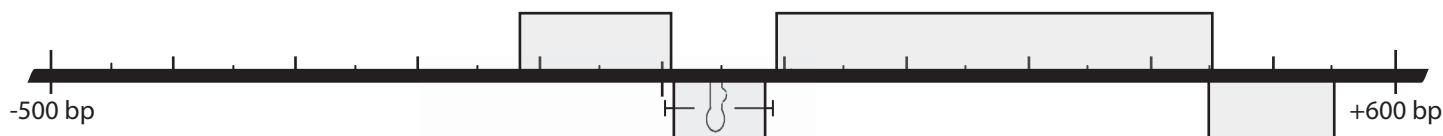
miR-548a-2



Chromosomal Band: 6q23.3
Base Positions: 135601991-135602087
ENSEMBL Gene: ENSG00000207689
Concurrent Transcripts: -

Censor Server Annotations (bp 5' to 3') :
Element 1: MADE1 (+12 to +92)
Element 2: LTR16C (+128 to +390)

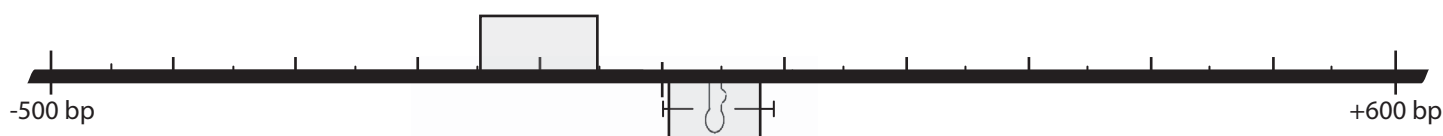
miR-548a-3



Chromosomal Band: 8q22.3
Base Positions: 105565773-105565869
ENSEMBL Gene: ENSG00000208032
Concurrent Transcripts: -

Censor Server Annotations (bp 5' to 3') :
Element 1: MLT1H1 (-115 to +5)
Element 2: MADE1 (+6 to +85)
Element 3: MLT1G1 (+97 to +453)
Element 4: MWIRb(+455 to +551)

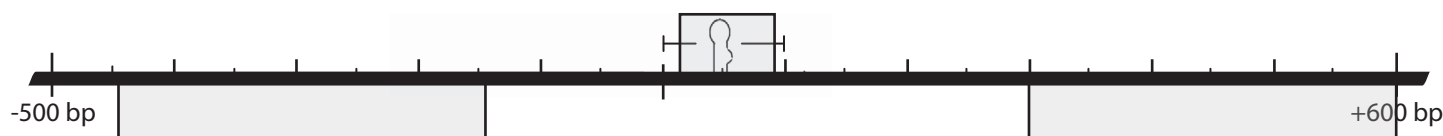
miR-548b



Chromosomal Band: 6q22.31
Base Positions: 119431911-119432007
ENSEMBL Gene: ENSG00000207982
Concurrent Transcripts: C6ORF60 Intron

Censor Server Annotations (bp 5' to 3') :
Element 1: BLOOD_I (-148 to -49)
Element 2: MADE1 (+6 to +85)

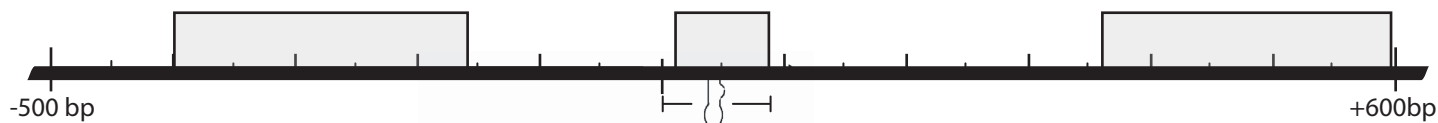
miR-548c



Chromosomal Band: 12q14.2
Base Positions: 63302556-63302652
ENSEMBL Gene: ENSG00000207546
Concurrent Transcripts: RASSF3 Intron

Censor Server Annotations (bp 5' to 3') :
Element 1: AluSg (-444 to -149)
Element 2: MADE1 (+13 to +92)
Element 3: AluSx (+304 to +597)

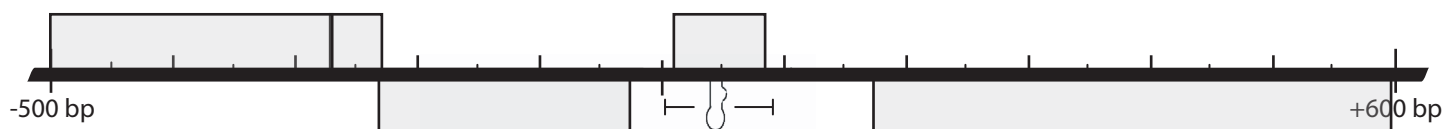
miR-548d-1



Chromosomal Band: 8q24.13
Base Positions: 124429455-124429551
ENSEMBL Gene: ENSG00000207704
Concurrent Transcripts: ATAD2 Intron

Censor Server Annotations (bp 5' to 3') :
Element 1: MWIR (-398 to -159)
Element 2: MADE1 (+6 to +85)
Element 3: AluSz (+362 to +597)

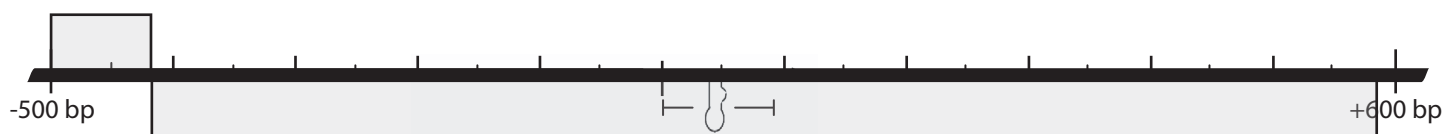
miR-548d-2



Chromosomal Band: 17q24.2
Base Positions: 62898067-62898163
ENSEMBL Gene: ENSG00000207688
Concurrent Transcripts: -

Censor Server Annotations (bp 5' to 3') :
Element 1: SVA (-499 to -278)
Element 2: L1MB4_5 (-277 to -232)
Element 3: L1ME1 (-231 to -29)
Element 4: MADE1 (+6 to +85)
Element 5: L1MD3 (+174 to +596)

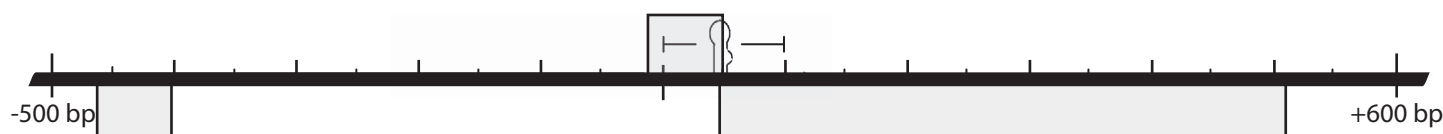
miR-552



Chromosomal Band: 1p34.3
Base Positions: 34907787-34907882
ENSEMBL Gene: ENSG00000207941
Concurrent Transcripts: -

Censor Server Annotations (bp 5' to 3') :
Element 1: THE1B (-499 to -412)
Element 2: L1MD2 (-410 to +587)

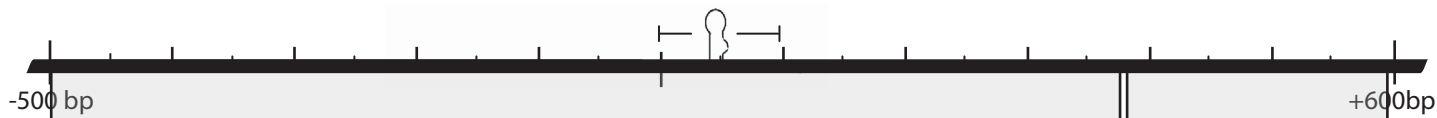
miR-558



Chromosomal Band: 2p22.3
Base Positions: 32610724-32610817
ENSEMBL Gene: ENSG00000207653
Concurrent Transcripts: BIRC6 Intron

Censor Server Annotations (bp 5' to 3') :
Element 1: CER17-I_CE (-464 to -398)
Element 1: FUGUREP2 (-14 to +52)
Element 1: MLT1C (+53 to +502)

miR-562



Chromosomal Band: 2q37.1
Base Positions: 232745607-232745701
ENSEMBL Gene: ENSG00000207626
Concurrent Transcripts: Q8N9K9 Intron

Censor Server Annotations (bp 5' to 3') :
Element 1: LINE1 (-499 to +375)
Element 2: LINE1 (+379 to +593)

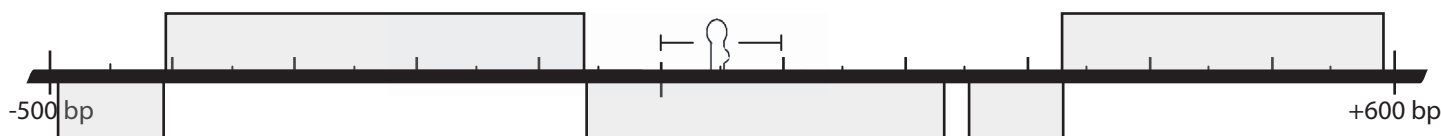
miR-565



Chromosomal Band: 3p21.31
Base Positions: 45705468-45705564
ENSEMBL Gene: ENSG00000207593
Concurrent Transcripts: ENSESTG00000004414

Censor Server Annotations (bp 5' to 3') :
Element 1: PRE1_SS (+29 to +94)
Element 2: EnSpm2_TM (+379 to +595)

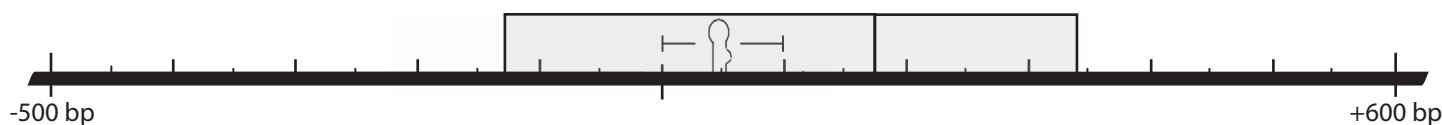
miR-566-1



Chromosomal Band: 10q22.1
Base Positions: 73665070-73665162
ENSEMBL Gene: ENSG00000207919
Concurrent Transcripts: C10ORF104 Intron

Censor Server Annotations (bp 5' to 3') :
Element 1: L1-5_DR (-493 to -405)
Element 2: SVA (-404 to -69)
Element 3: AluSx (-68 to +229)
Element 4: MER57A_I (+253 to +324)
Element 5: AluSx (+325 to +594)

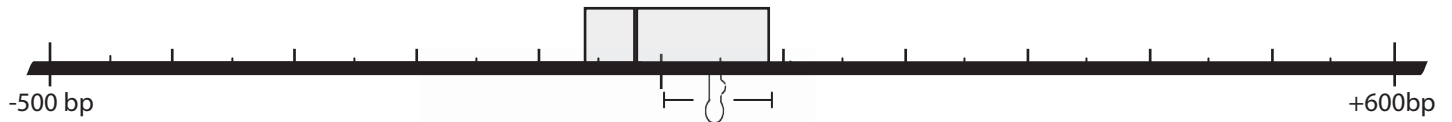
miR-566-2



Chromosomal Band: 3p21.31
Base Positions: 50185763-50185856
ENSEMBL Gene: ENSG00000207922
Concurrent Transcripts: SEMA3F Intron

Censor Server Annotations (bp 5' to 3') :
Element 1: AluSg (-133 to +170)
Element 2: AluJb (+171 to +346)

miR-568



Chromosomal Band: 3q13.31
Base Positions: 115518012-115518106
ENSEMBL Gene: ENSG00000207770

Concurrent Transcripts: -

Censor Server Annotations (bp 5' to 3') :
Element 1: ERVL (-61 to -20)
Element 2: SPMLIKE (-19 to +93)

miR-570

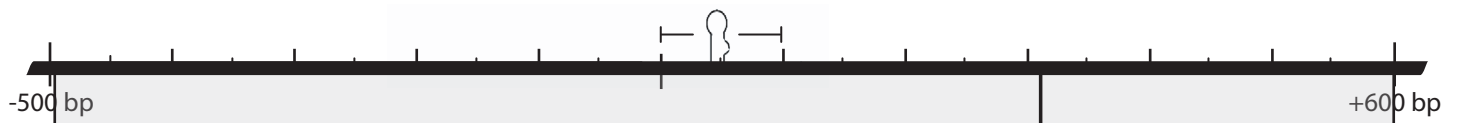


Chromosomal Band: 3q29
Base Positions: 196911452-196911548
ENSEMBL Gene: ENSG00000207650

Concurrent Transcripts: -

Censor Server Annotations (bp 5' to 3') :
Element 1: MADE1 (+13 to +91)
Element 2: EnSpm2_TM (+243 to +595)

miR-576

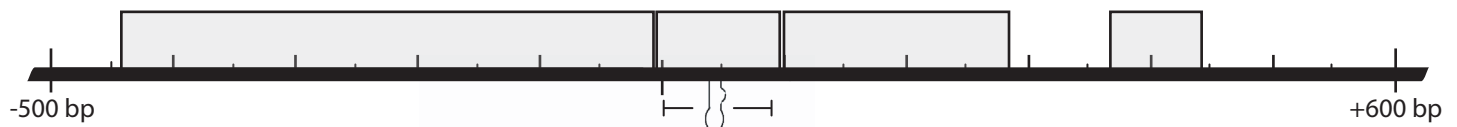


Chromosomal Band: 4q25
Base Positions: 110629303-110629400
ENSEMBL Gene: ENSG00000207988

Concurrent Transcripts: SEC24B Intron

Censor Server Annotations (bp 5' to 3') :
Element 1: LINE1 (-493 to +302)
Element 2: LINE1 (+307 to +598)

miR-579

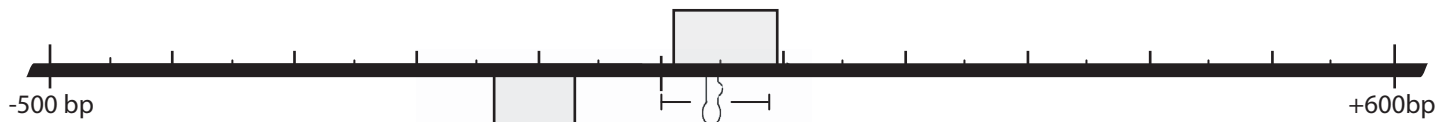


Chromosomal Band: 5p13.3
Base Positions: 32430241-32430338
ENSEMBL Gene: ENSG00000207956

Concurrent Transcripts: ZFR Intron

Censor Server Annotations (bp 5' to 3') :
Element 1: LINE1 (-447 to -4)
Element 2: MADE1 (-2 to +94)
Element 3: LINE1 (+95 to +291)
Element 4: CR1 (+368 to +448)

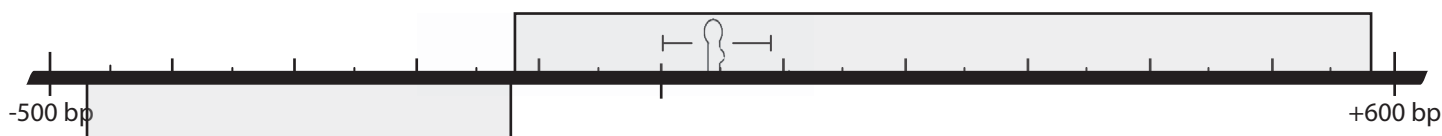
miR-584



Chromosomal Band: 5q32
Base Positions: 148422069-148422165
ENSEMBL Gene: ENSG00000207714
Concurrent Transcripts: SH3TC2 Intron

Censor Server Annotations (bp 5' to 3') :
Element 1: LINE1 (-143 to -68)
Element 2: MER81 (+9 to +97)

miR-588



Chromosomal Band: 6q22.32
Base Positions: 126847470-126847552
ENSEMBL Gene: ENSG00000207632
Concurrent Transcripts: -

Censor Server Annotations (bp 5' to 3') :
Element 1: LINE1 (-465 to -120)
Element 2: LINE1 (-119 to +583)

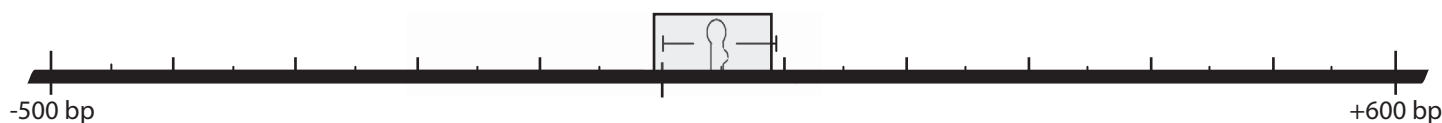
miR-591



Chromosomal Band: 7q21.3
Base Positions: 95686910-95687004
ENSEMBL Gene: ENSG00000208025
Concurrent Transcripts: SLC25A13 Intron

Censor Server Annotations (bp 5' to 3') :
Element 1: MER5A (-53 to +48)

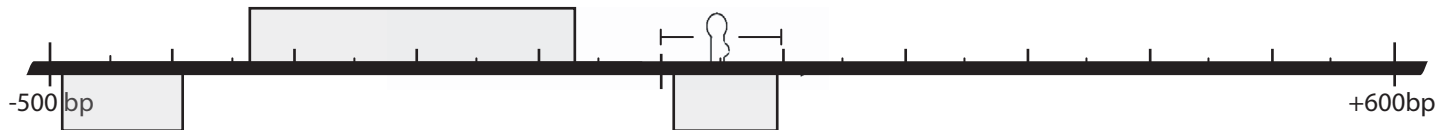
miR-594



Chromosomal Band: 7q34
Base Positions: 138675997-138676085
ENSEMBL Gene: ENSG00000207796
Concurrent Transcripts: ENSESTG00000018887 Intron

Censor Server Annotations (bp 5' to 3') :
Element 1: TC4 (-6 to +85)

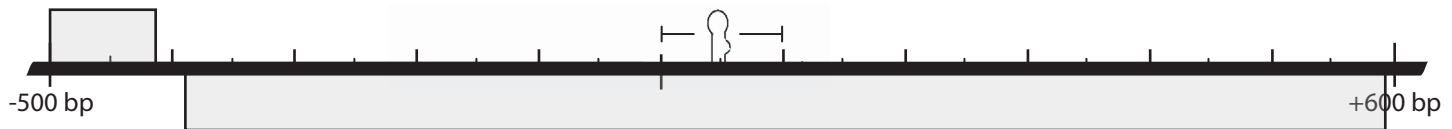
miR-603



Chromosomal Band: 10p12.1
Base Positions: 24604620-24604716
ENSEMBL Gene: ENSG00000207930
Concurrent Transcripts: Q5T5P2 Intron

Censor Server Annotations (bp 5' to 3') :
Element 1: MEN (-489 to -392)
Element 2: MER82 (-338 to -66)
Element 3: MADE1 (+12 to +92)

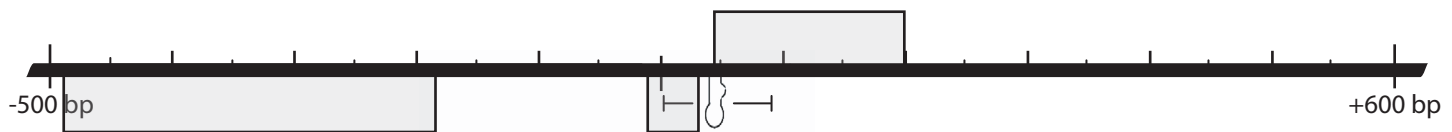
miR-606



Chromosomal Band: 10q22.2
Base Positions: 76982222-76982317
ENSEMBL Gene: ENSG00000207583
Concurrent Transcripts: C10ORF11 Intron

Censor Server Annotations (bp 5' to 3') :
Element 1: AluJb (-499 to -416)
Element 2: LINE1 (-386 to +594)

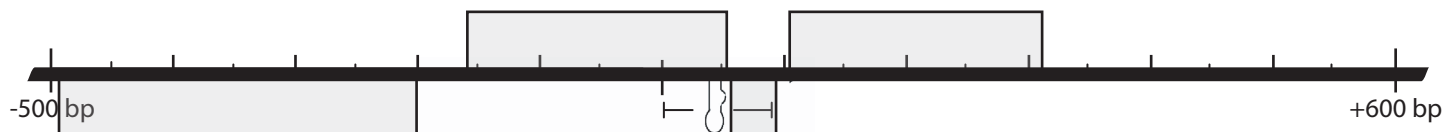
miR-607



Chromosomal Band: 10q24.1
Base Positions: 98578416-98578511
ENSEMBL Gene: ENSG00000207976
Concurrent Transcripts: -

Censor Server Annotations (bp 5' to 3') :
Element 1: AluSz (-489 to -194)
Element 2: MWIR (-11 to +26)
Element 3: MWIR (+43 to +198)

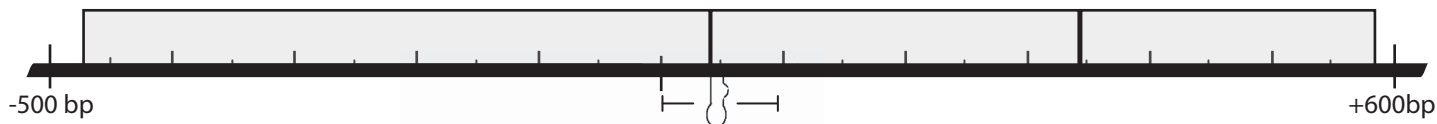
miR-616



Chromosomal Band: 12q13.3
Base Positions: 56199213-56199309
ENSEMBL Gene: ENSG00000208028
Concurrent Transcripts: DDIT3 Intron

Censor Server Annotations (bp 5' to 3') :
Element 1: AluSq (-496 to -203)
Element 2: LINE2A (-157 to +52)
Element 3: LINE2A (+59 to +93)
Element 4: LINE2A (+103 to +313)

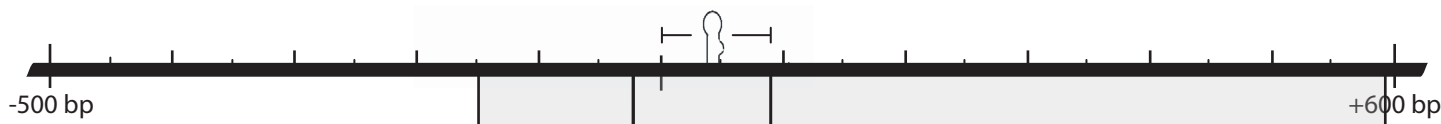
miR-619



Chromosomal Band: 12q24.11
Base Positions: 107754813-107754911
ENSEMBL Gene: ENSG00000207622
Concurrent Transcripts: SSH1 Intron

Censor Server Annotations (bp 5' to 3') :
Element 1: LINE1MC4 (-474 to +41)
Element 2: AluSz (+42 to +348)
Element 3: LINE1MC4 (+349 to +588)

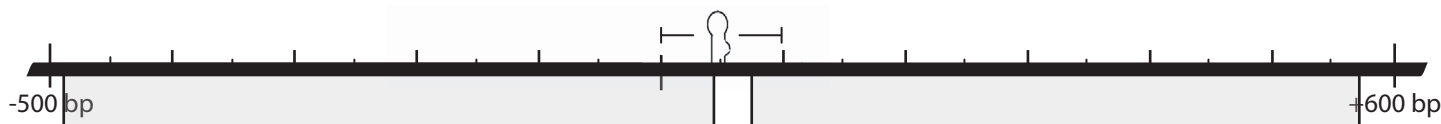
miR-625



Chromosomal Band: 14q23.3
Base Positions: 65007573-65007657
ENSEMBL Gene: ENSG00000207781
Concurrent Transcripts: FUT8 Intron

Censor Server Annotations (bp 5' to 3') :
Element 1: LINE1MC (-150 to -32)
Element 1: LINE1MC (-31 to +94)
Element 1: LINE1MC (+95 to +583)

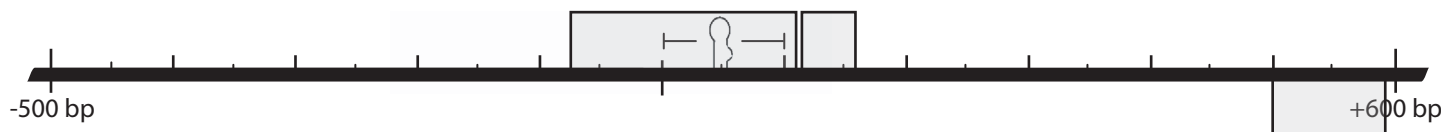
miR-626



Chromosomal Band: 15q15.1
Base Positions: 39771075-39771168
ENSEMBL Gene: ENSG00000207766
Concurrent Transcripts: MGA Intron

Censor Server Annotations (bp 5' to 3') :
Element 1: LINE1 (-496 to +42)
Element 2: LINE1MC (+77 to +568)

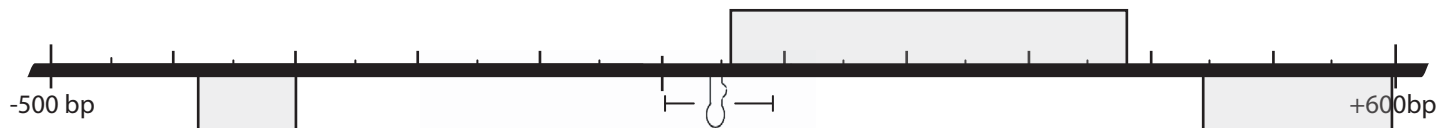
miR-633



Chromosomal Band: 17q23.3
Base Positions: 58375308-58375405
ENSEMBL Gene: ENSG00000207552
Concurrent Transcripts: -

Censor Server Annotations (bp 5' to 3') :
Element 1: AluSq (-72 to +108)
Element 2: THER1 (+115 to +155)
Element 3: LINE2A (+501 to +598)

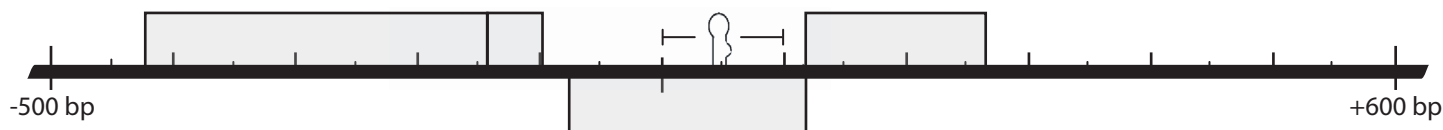
miR-637



Chromosomal Band: 19p13.3
Base Positions: 3912412-3912510
ENSEMBL Gene: ENSG00000207733
Concurrent Transcripts: DAPK3 Intron

Censor Server Annotations (bp 5' to 3') :
Element 1: SC-3 (-376 to -300)
Element 2: LINE1MC4 (+62 to +386)
Element 3: AluY (+449 to +596)

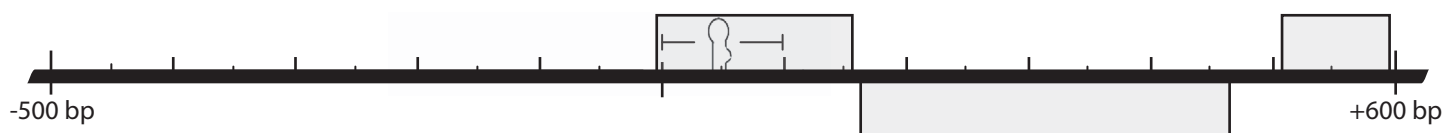
miR-638



Chromosomal Band: 19p13.2
Base Positions: 10690080-10690179
ENSEMBL Gene: ENSG00000207972
Concurrent Transcripts: DNMT2 Intron

Censor Server Annotations (bp 5' to 3') :
Element 1: MERMITE18c (-420 to -146)
Element 2: OSTE15 (-145 to -100)
Element 3: AC9 (-74 to +112)
Element 4: SABRINA1 (+113 to +266)

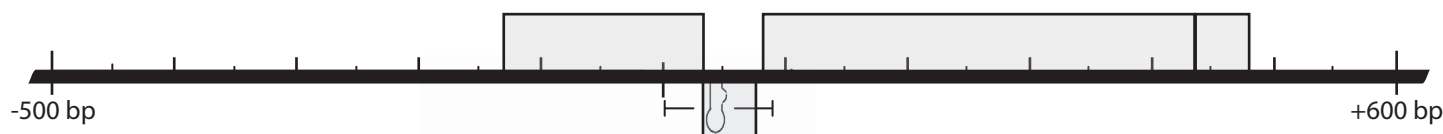
miR-640



Chromosomal Band: 19p13.11
Base Positions: 19406872-19406967
ENSEMBL Gene: ENSG00000207821
Concurrent Transcripts: GATAD2A Intron

Censor Server Annotations (bp 5' to 3') :
Element 1: THER1 (-4 to +159)
Element 2: AluJb (+169 to +462)
Element 3: AluSq (+506 to +596)

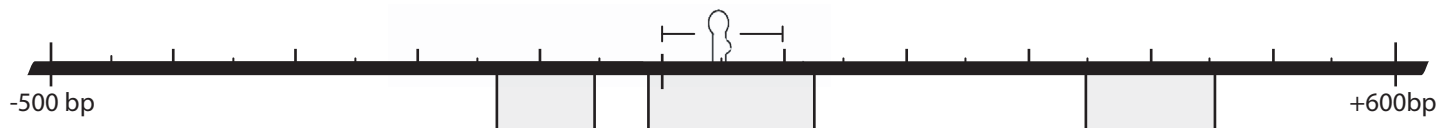
miR-649



Chromosomal Band: 22q11.21
Base Positions: 19718465-19718561
ENSEMBL Gene: ENSG00000207575
Concurrent Transcripts: -

Censor Server Annotations (bp 5' to 3') :
Element 1: LINE1 (-126 to +32)
Element 2: MER8 (+33 to +73)
Element 3: AluSz (+89 to +431)
Element 4: LINE1 (+432 to +473)

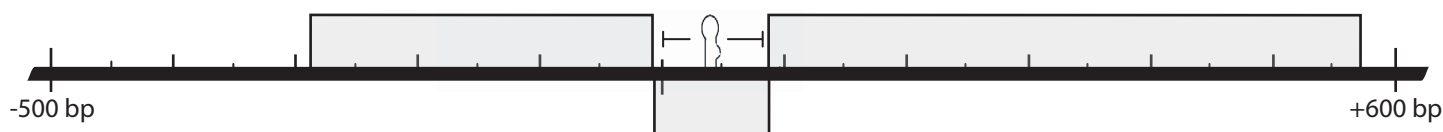
miR-652



Chromosomal Band: Xq23
Base Positions: 109185213-109185310
ENSEMBL Gene: ENSG00000208013
Concurrent Transcripts: Q9H617 Intron

Censor Server Annotations (bp 5' to 3') :
Element 1: BOVB (-142 to -61)
Element 2: MER91C (-9 to +118)
Element 3: LINE2B (+348 to +452)

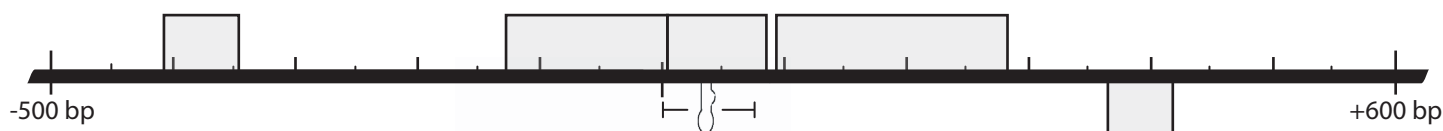
miR-297-1^c



Chromosomal Band: 12p12.1
Base Positions: 24038064-240381481
ENSEMBL Gene: ENSG00000207823
Concurrent Transcripts: -

Censor Server Annotations (bp 5' to 3') :
Element 1: AluSz (-276 to -3)
Element 2: Gypsy2 (-2 to +76)
Element 3: LINE1 (+77 to +569)

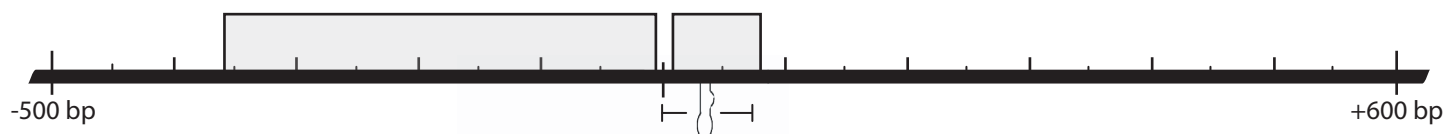
miR-297-2^c



Chromosomal Band: 12p13.31
Base Positions: 5943647-5943729
ENSEMBL Gene: ENSG00000207822
Concurrent Transcripts: VWF Intron

Censor Server Annotations (bp 5' to 3') :
Element 1: THER1 (-406 to -348)
Element 2: AluJb (-120 to +3)
Element 3: DM1731 (+4 to +85)
Element 4: AluJb (+93 to +288)
Element 5: LTR92 (+360 to +414)

miR-297-3^c



Chromosomal Band: 10q23.2
Base Positions: 88046488-88046570
ENSEMBL Gene: ENSG00000207824
Concurrent Transcripts: GRID1 Intron

Censor Server Annotations (bp 5' to 3') :
Element 1: AluYa1 (-292 to +1)
Element 2: Polinton1 (+2 to +81)