

FIG. 1A

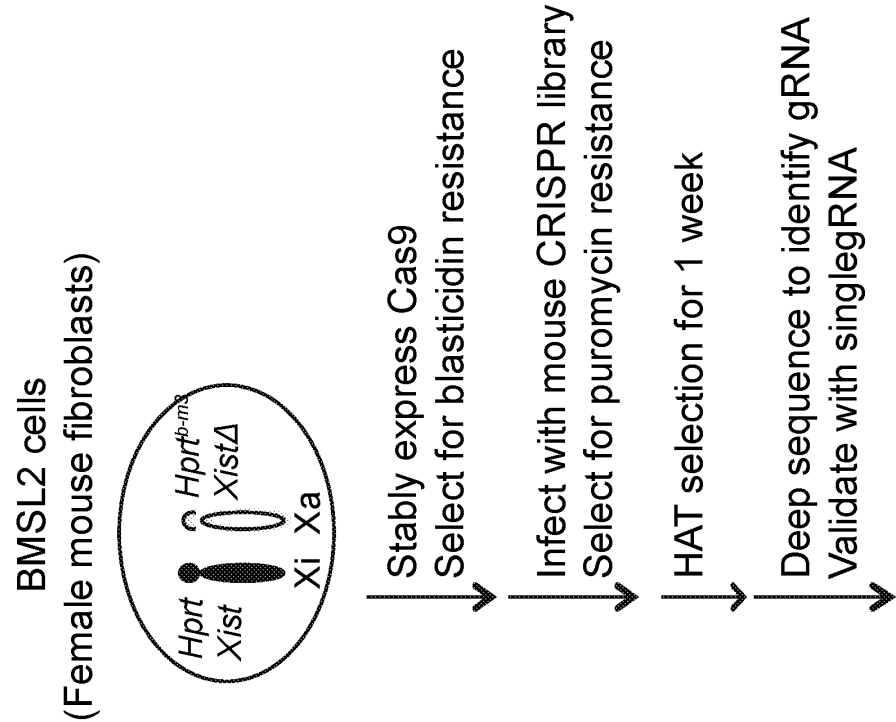


FIG. 1B

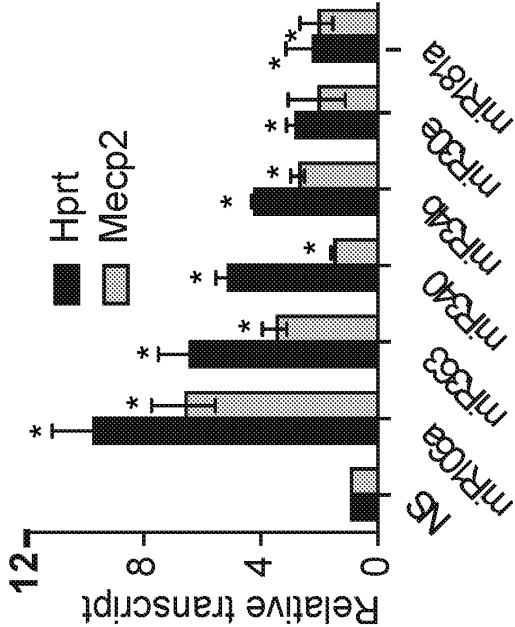
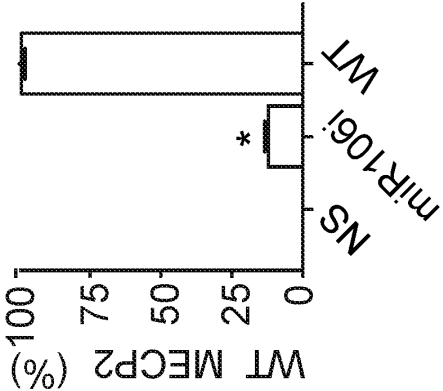


FIG. 1C



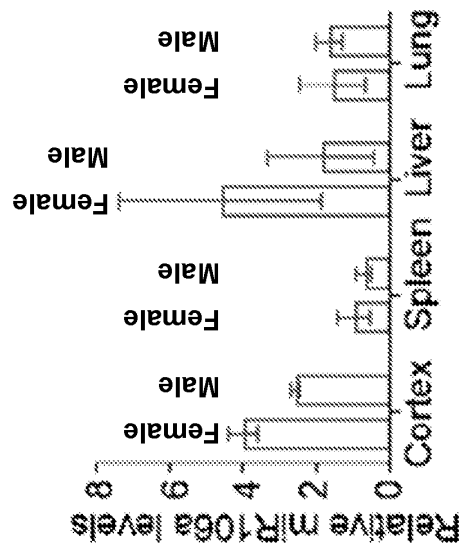


FIG. 1D

FIG. 2A

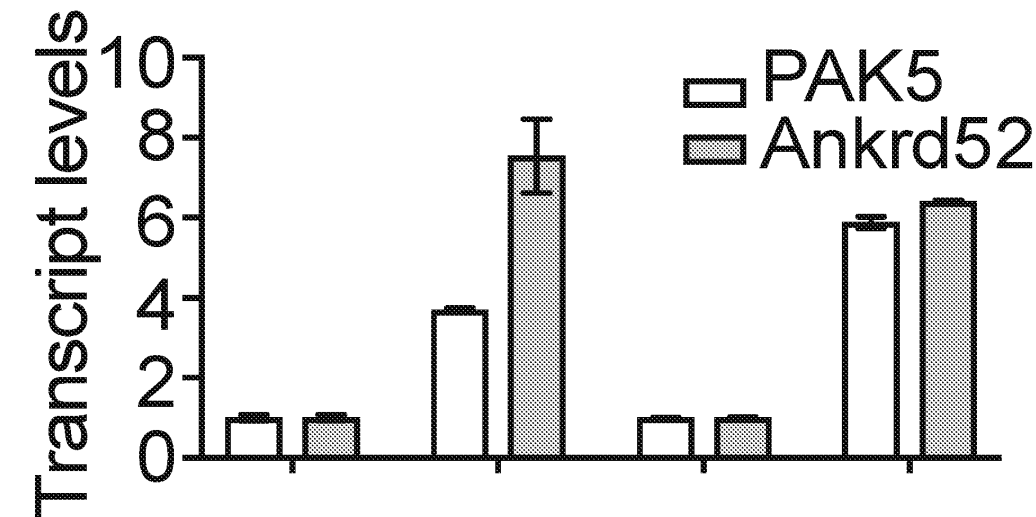
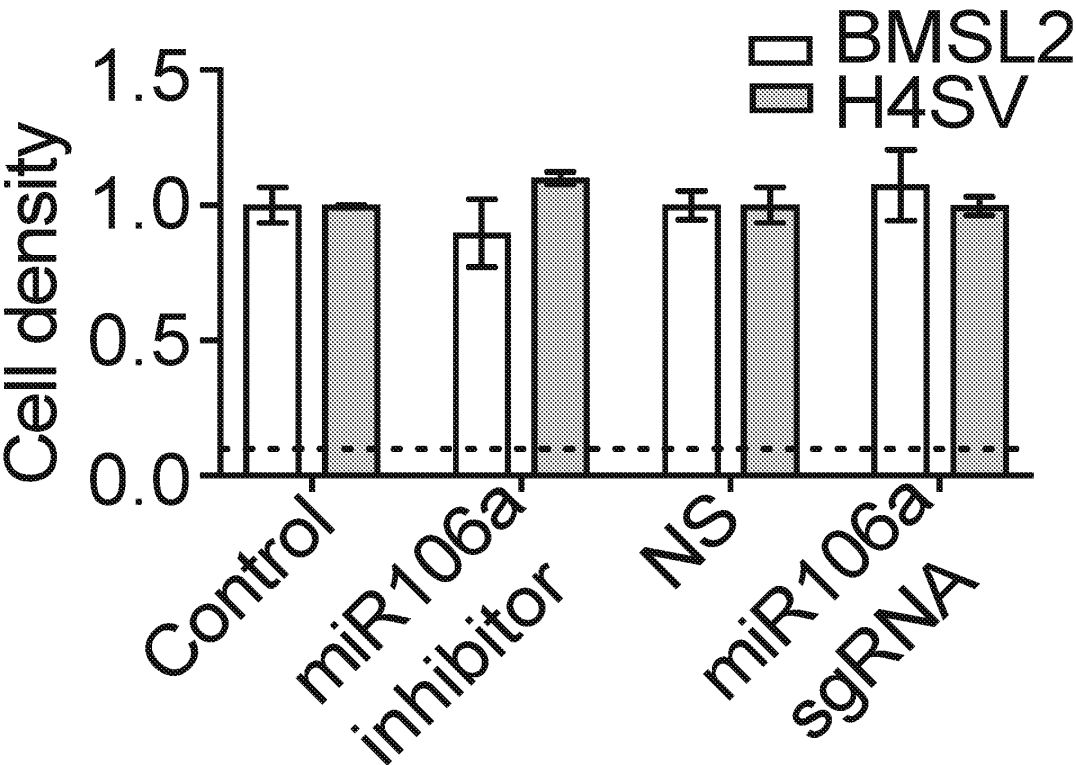
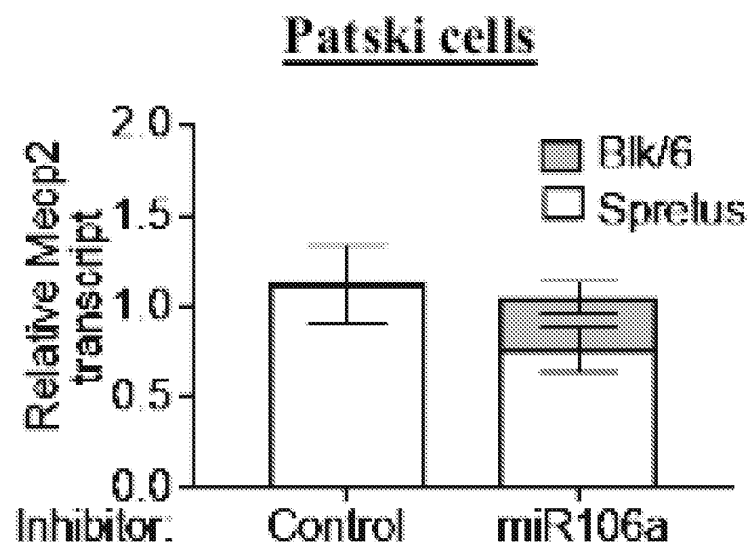
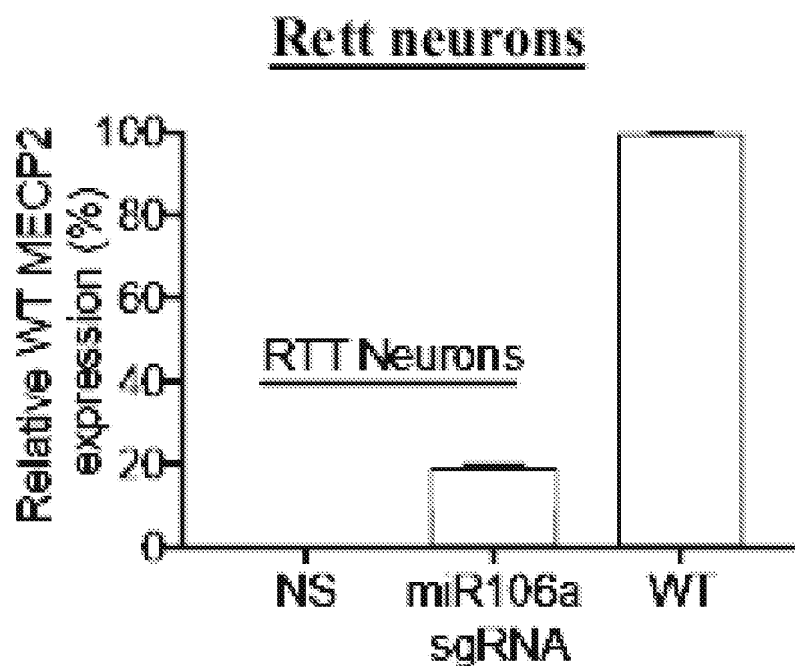


FIG. 2B



**FIG. 2C****FIG. 2D**

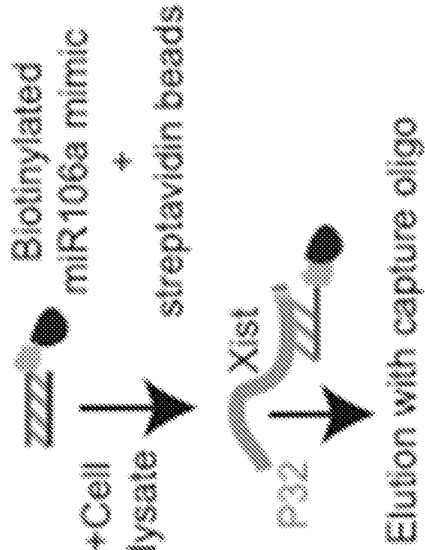


FIG. 3A

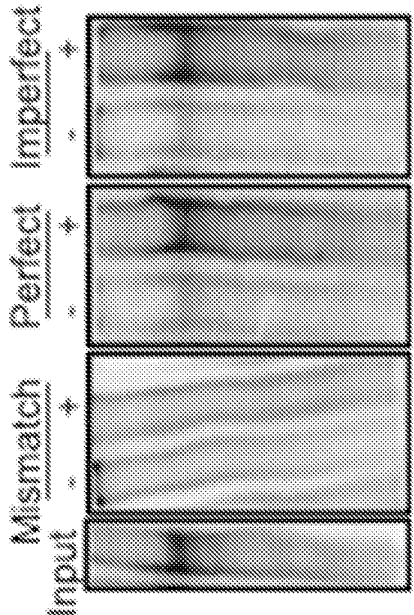


FIG. 3B

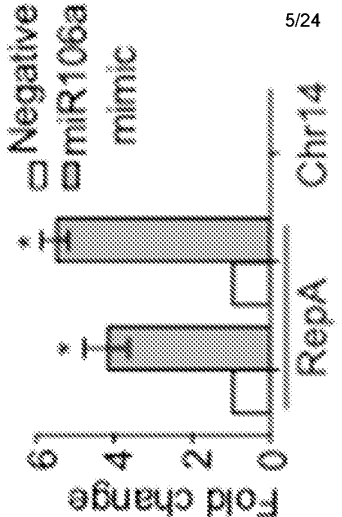


FIG. 3C

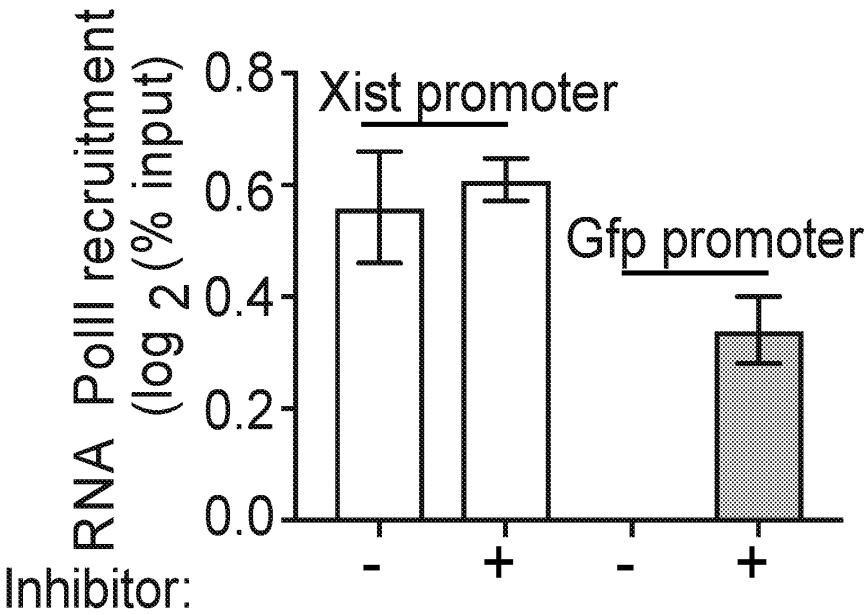


FIG. 4A

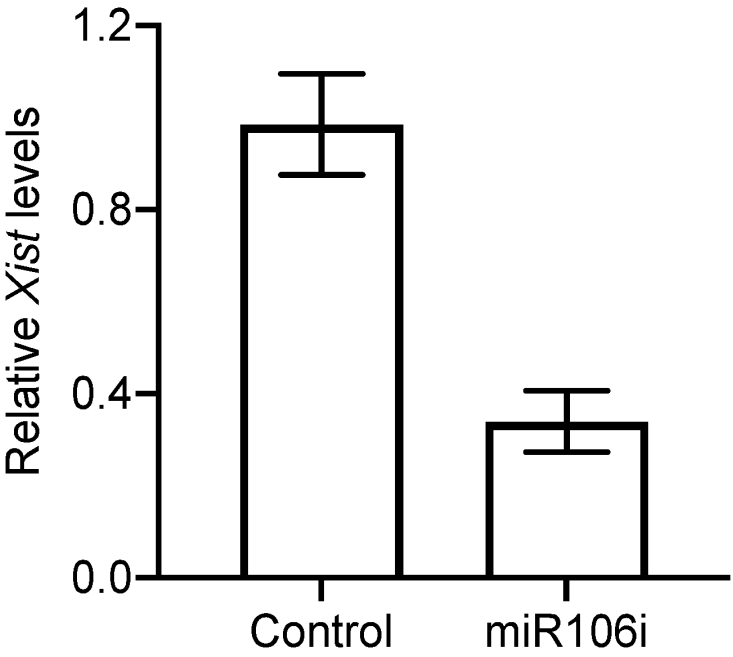
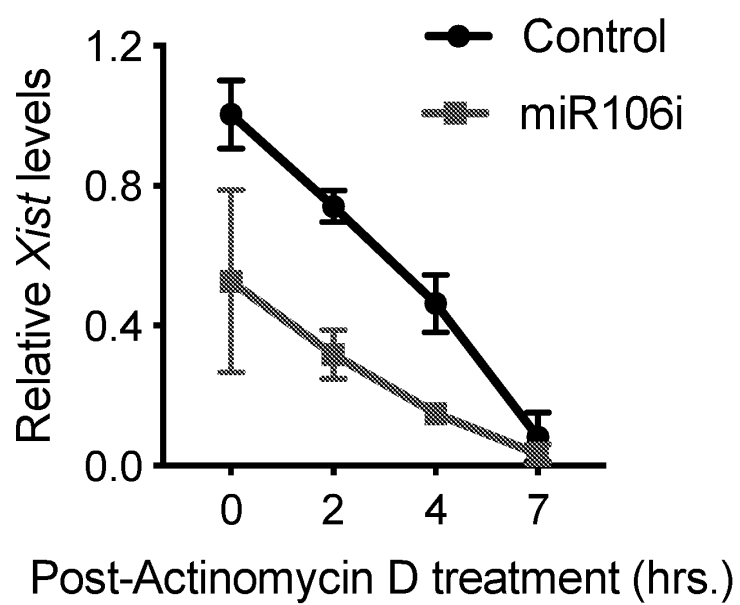


FIG. 4B

**FIG. 4C**

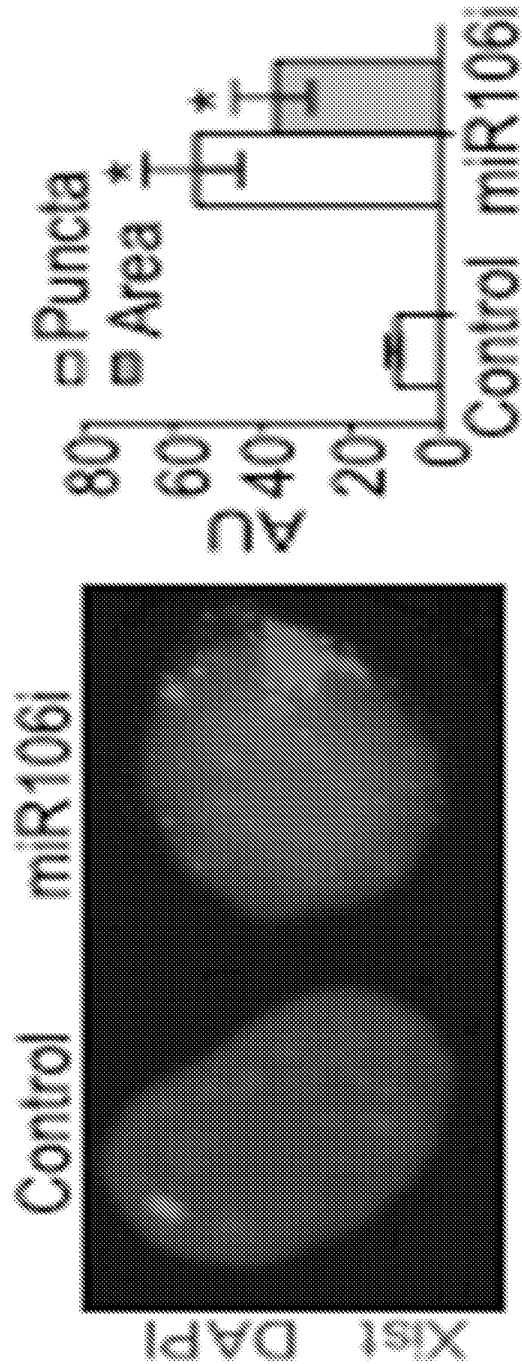


FIG. 5A

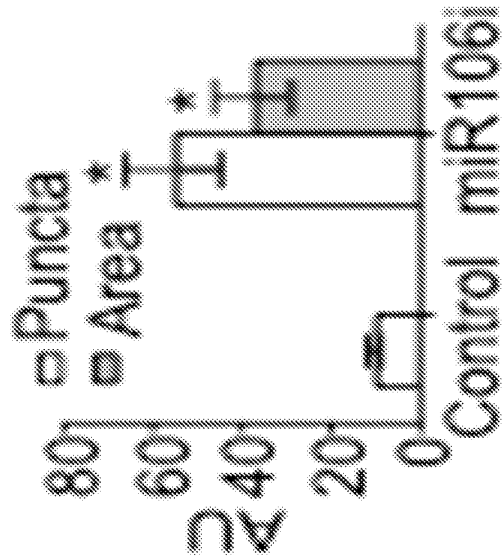


FIG. 5B

miR106a-RepA free energy

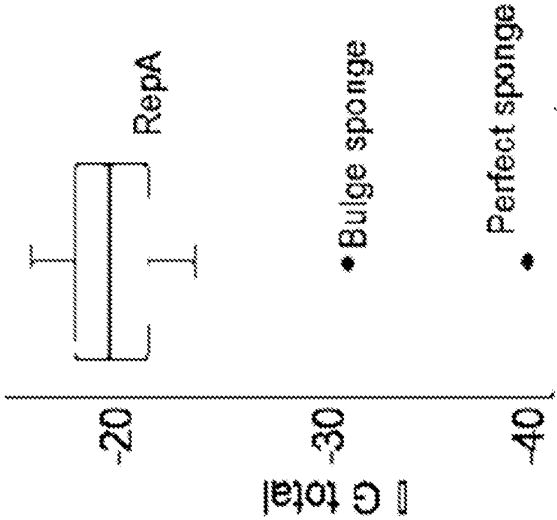


FIG. 5C

miR106a-RepA binding

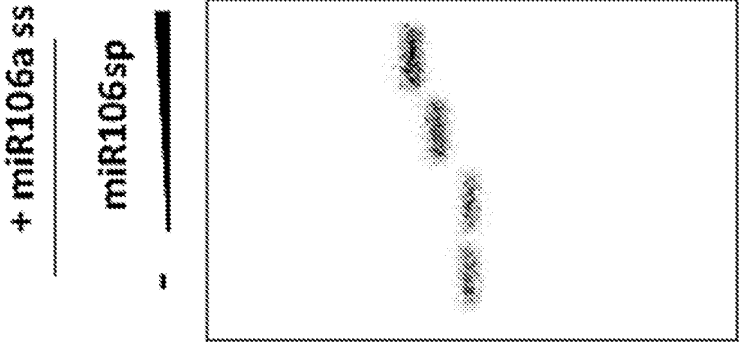


FIG. 5D

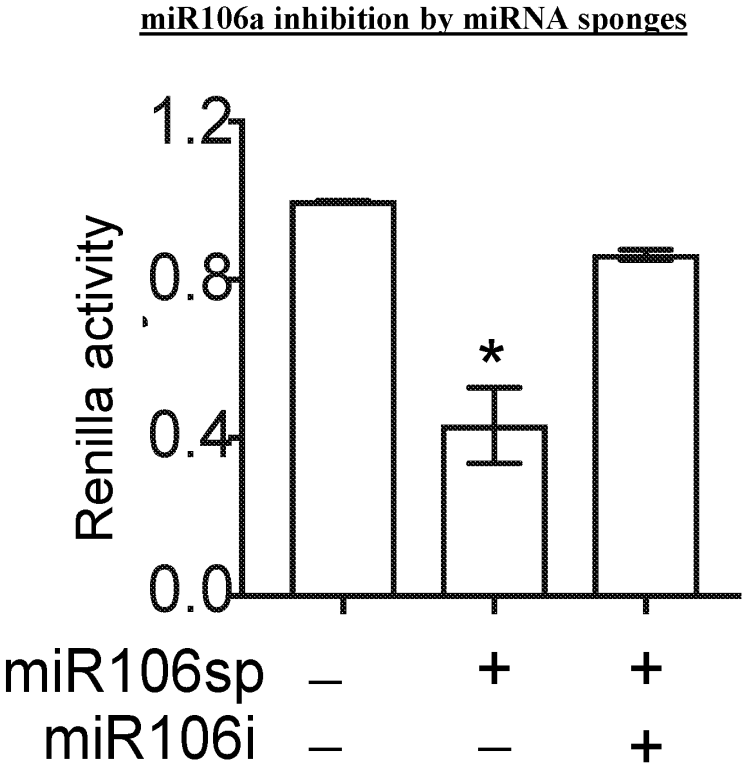


FIG. 6

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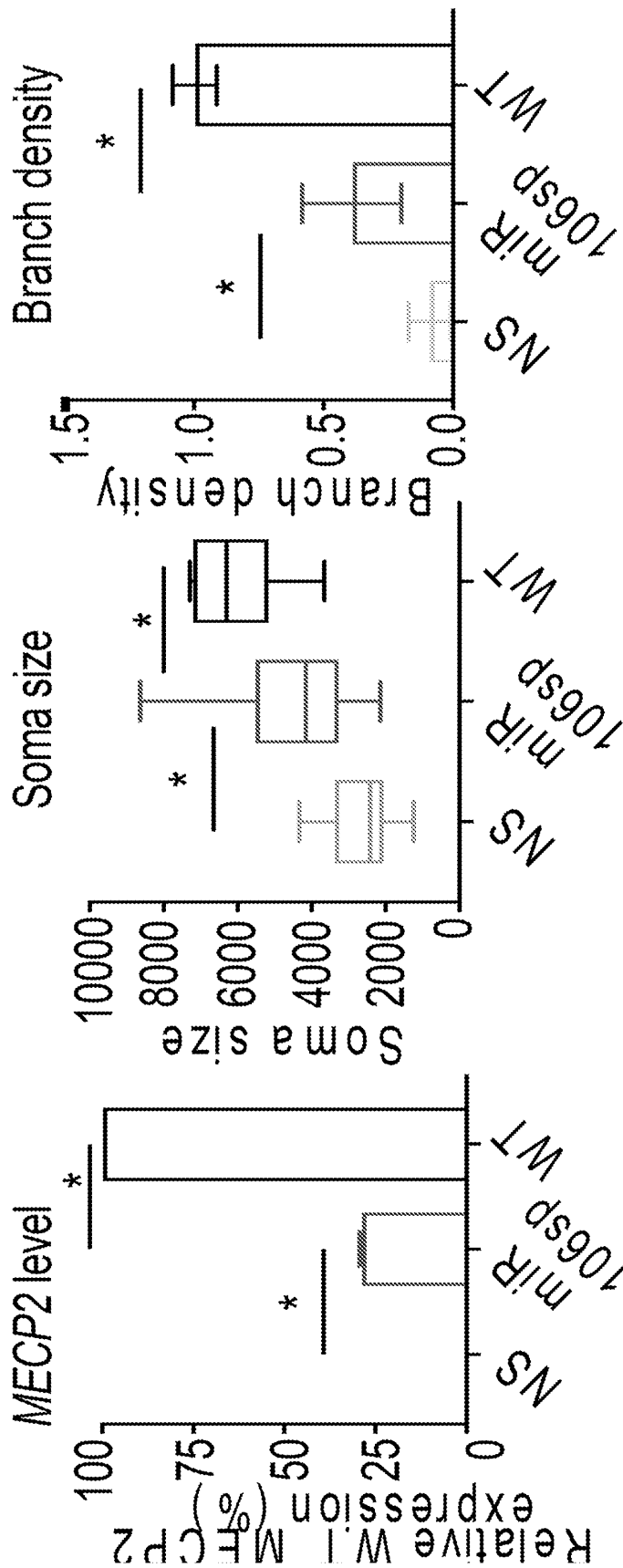
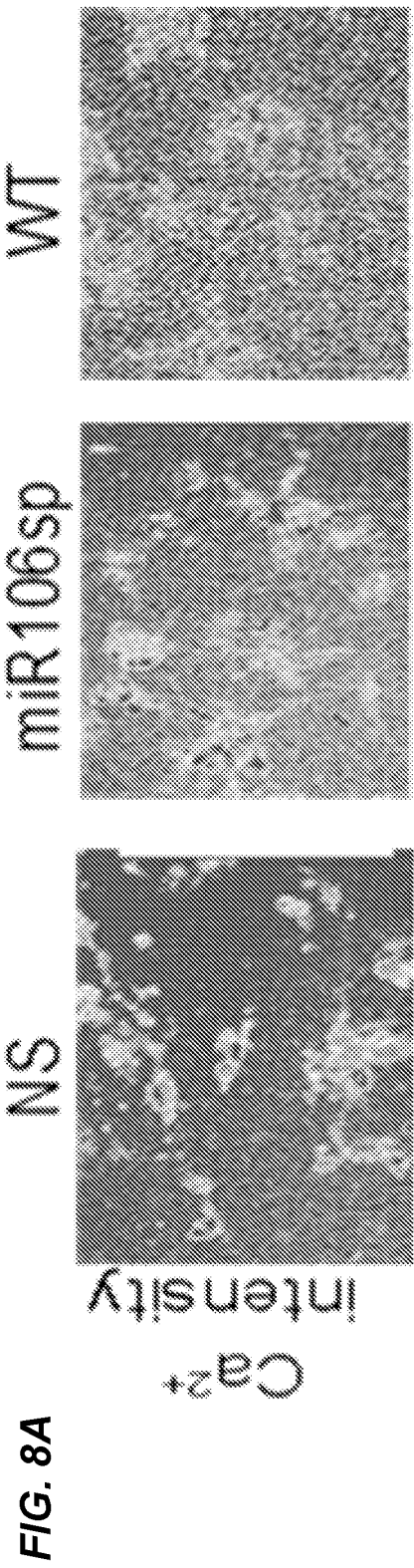
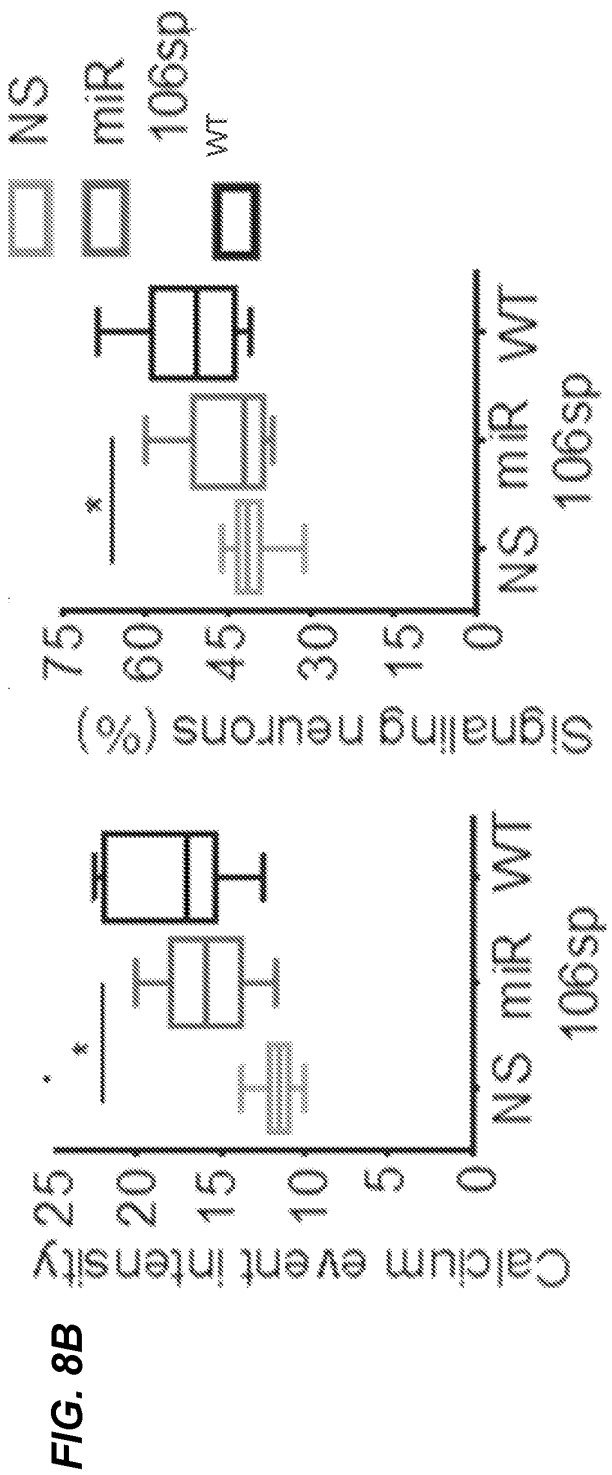


FIG. 7A

FIG. 7B

FIG. 7C



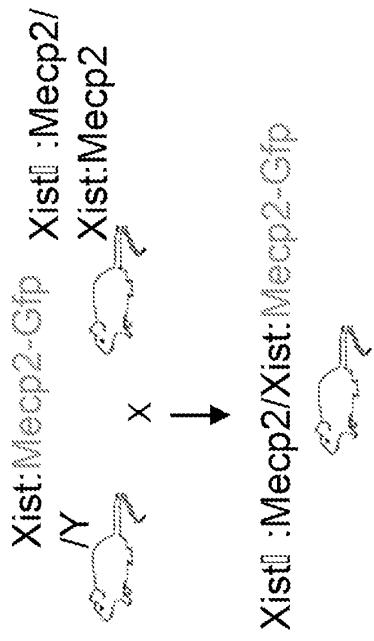


FIG. 9A



FIG. 9B

FIG. 9C

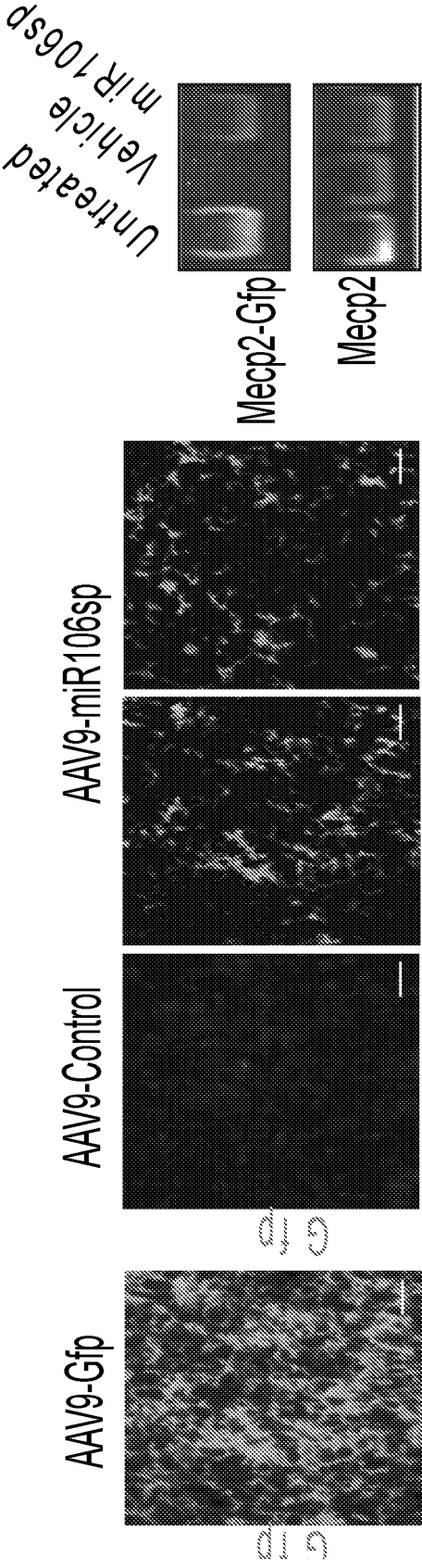


FIG. 10A

FIG. 10B

FIG. 10C

FIG. 11A

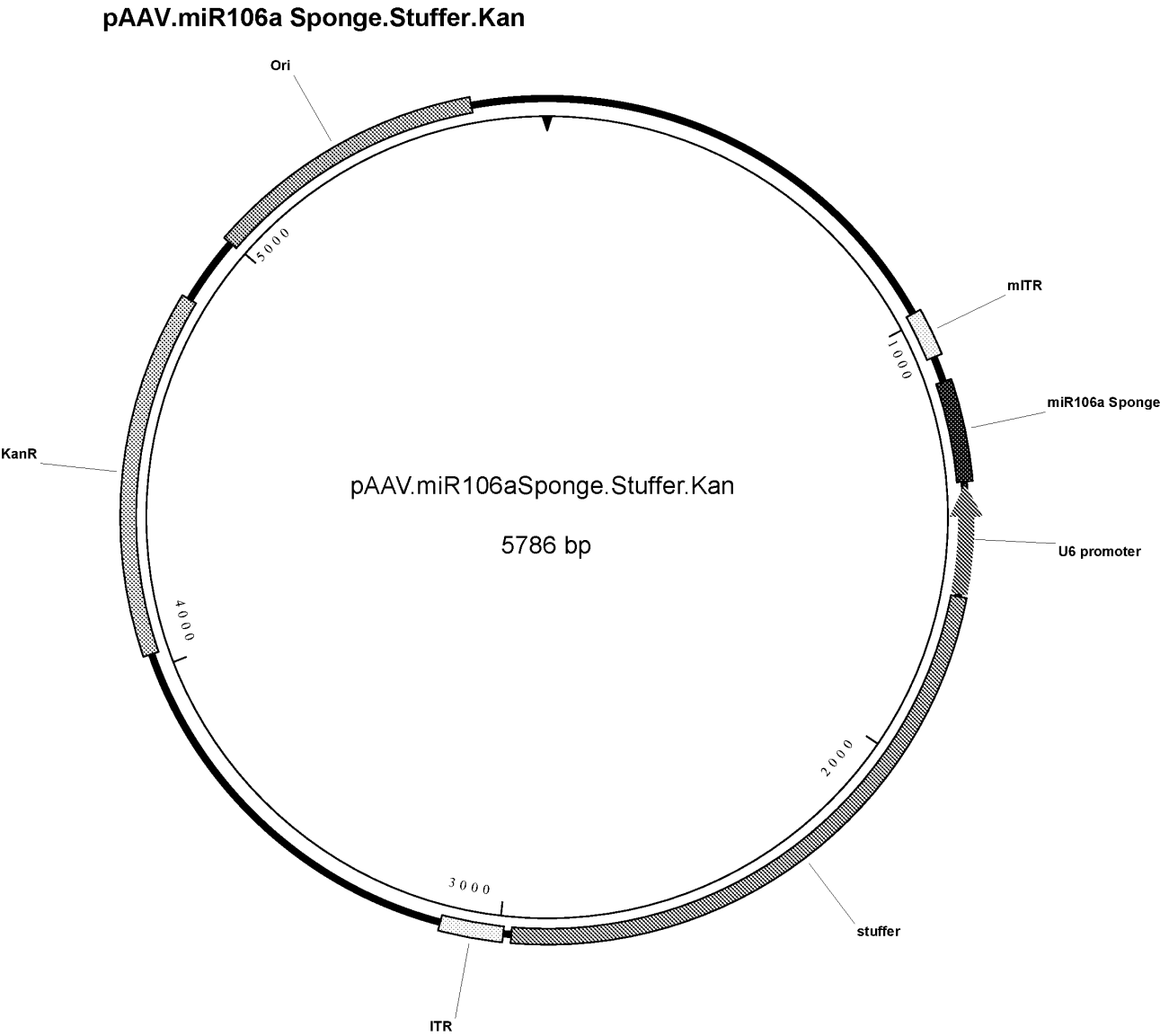


FIG. 11B**pAAV.miR106a Sponge.Stuffer.Kan (SEQ ID NO: 21)**

ITR

mi-R106a spongeU6 promoterstufferKanROri

GCCCAATACGCAAACCGCCTCTCCCCGCGCGTTGGCCGATTCAATATGCAGCTGGCGTAATAGCG
AAGAGGCCCCGACCGATCGCCCTTCCCAACAGTTGCGCAGCCTGAATGGCGAATGGCGATTCCGTT
GCAATGGCTGGCGGTAATATTGTTCTGGATATTACCAGCAAGGCCGATAGTTTGAGTTCTTCTACTCA
GGCAAGTGATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTTAATTTGCGTGATGGACAGACTC
TTTTACTCGGTGGCTCACTGATTATAAAAAACACTTCTCAGGATTCTGGCGTACCGTTCTGTCTAAA
ATCCCTTTAATCGGCCTCCTGTTTAGCTCCCGCTCTGATTCTAACGAGGAAAGCACGTTATACGTGCT
CGTCAAAGCAACCATAGTACGCGCCCTGTAGCGGCGCATTAAAGCGCGCGGGTGTGGTGGTTACG
CGCAGCGTGACCGCTACACTTGCCAGCGCCCTAGCGCCCGCTCCTTTTCGCTTTCTCCCTTCCTTTT
TCGCCACGTTTCGCCGGCTTTCCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCGGATTAG
TGCTTTACGGCACCTCGACCCCAAAAACTTGATTAGGGTGATGGTTCACGTAGTGGGCCATCGCCC
TGATAGACGGTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCTTTAATAGTGGAAGTCTTGTTCCAAAC
TGGAACAACACTCAACCCTATCTCGGTCTATTCTTTTGATTATAAGGGATTTTGCCGATTTTCGGCCT
ATTGGTTAAAAAATGAGCTGATTTAACAAAAATTTAACGCGAATTTTAACAAAATATTAACGCTTACAAT
TTAAATATTTGCTTATACAATCTTCCTGTTTTTGGGGCTTTTCTGATTATCAACCGGGGTACATATGAT
TGACATGCTAGTTTTACGATTACCGTTCATCGCCCTGCGCGCTCGCTCGCTCACTGAGGCCGCCCCG
GGCAAAGCCCCGGGCGTCGGGCGACCTTTGGTCGCCCGGCCCTCAGTGAGCGAGCGAGCGCGCAG
AGAGGGAGTGGAATTCACGCGTGATCTGAATTCATTACGCGTGGTACCGTCTCGAGGTGAGAG
ATTCAAAAACAAAGTGCGGGAGTGCAAGGTAGTAAGTCAAAAGTGCTAACAGTGCAAGGTAGTAAGTCAA
AGTGCGGGAGTGCAAGGTAGTAAGTCAAAAGTGCTAACAGTGCAAGGTAGTAAGTCAAAAGTGCGGGAGT
GCAGGTAGTAAGTCAAAAGTGCTAACAGTGCAAGGTAGTAAGTCAAAAGTGCGGGAGTGCAAGGTAGTAA
CTCAAAGTGCTAACAGTGCAAGGTAGCCGGTGTTCGTCTTTCCACAAGATATATAAAGCCAAAGAA
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AGGCCCTCGGTGAAGACTAGTTATTAATAGTAATCAATTACGGGGTCATTAGTTTCATAGCCCATAT
ATGGAGTTCCGCCTGCAGGGACGTCGACGGATCGGGAGATCTCCCGATCCCCTATCTGCTCCCTG
CTTGTTGTTGGAGGTCGCTGAGTAGTGCGCGAGCAAAATTTAAGCTACAACAAGGCAAGGCTTG
ACCGACAATTGCATGAAGAATCTGCTTAGGGTTAGGCGTTTTGCGCTGCTTCGCGGCGCGCCTTTT
AAGGCAGTTATTGGTGCCCTTAAACGCCTGGTGCTACGCCTGAATAAGTGATAATAAGCGGATGA
ATGGCAGAAATTCGCCCGGATCTTTGTGAAGGAACCTTACTTCTGTGGTGTGACATAATTGGACAAA
CTACCTACAGAGATTTAAAGCTCTAATGTAAGCAGACAGTTTTATTGTTTCATGATGATATATTTTTAT
CTTGTCGAATGTAACATCAGAGATTTGAGACACAACGTGGCTTTCCCCCCCCCCCCCTAGGGTGG
GCGAAGAACTCCAGCATGAGATCCCCGCGCTGGAGGATCATCCAGCCGGCGTCCCGGAAAACGA
TTCCGAAGCCCAACCTTTATAGAAGGCGGCGGTGGAATCGAAATCTCGTGATGGCAGGTTGGGC
GTCGCTTGGTCGGTCATTTTGAACCCAGAGTCCCGCTCAGGGCGCGCCGGGGGGGGGGCGCT
GAGGTCTGCCTCGTGAAGAAGGTGTTGCTGACTCATACCAGGCCTGAATCGCCCCATCATCCAGC
CAGAAAGTGAGGGAGCCACGGTTGATGAGAGCTTTGTTGTAGGTGGACCAGTCTGCAAGGAGCAT
AAAGTGTAAGCCTGGGGTGCCTAATGAGTGAGCTAACTCACATTAATTGCGTTGCGCTCACTGCC
CGTTTTCCAGTCGGGAAACCTGTCGTGCCCGCCAGTCTAGCTATCGCCATGTAAGCCCACTGCA

FIG. 11B Continued

AGCTACCTGCTTTCTCTTTGCGCTTGCGTTTTCCCTTGTCAGATAGCCCAGTAGCTGACATTCATC
CGGGGTCAGCACCGTTTCTGCGGACTGGCTTTCTACGTGTCTGGTTCGAGGCGGGATCAGCCACC
GCGGTGGCGGCCTAGAGTCGACGAGGAAGTGA AAAACCAGAAAGTTAACTGGCCTGTACGGAAG
TGTTACTTCTGCTCTAAAAGCTGCGGAATTGTACCCGCGGCCGATCCACCGGTGCCACCAGCGG
CCATCAAGCACGTTATCGATACCGTCGACTAGAGCTCGCTGATCAGTGGGGGGTGGGGTGGGGC
AGGACAGCAAGGGGGAGGATTGGAAGACAATAGCAGCTGCAGAAGTTTAAACGCATGCTGGGG
AGAGATCGATCTGAGGAACCCCTAGTGATGGAGTTGGCCACTCCCTCTCTGCGCGCTCGCTCGCTC
ACTGAGGCCGGGCGACCAAAGGTCGCCCCAGCGCCGGGCTTTGCCCGGGCGGCCTCAGTGAGC
GAGCGAGCGCGCAGAGAGGGAGTGGCCCCCCCCCCCCCCCCCGGCGATTCTCTTGTGTTGCTC
CAGACTCTCAGGCAATGACCTGATAGCCTTTGTAGAGACCTCTCAAAAATAGCTACCCCTCTCCGGCA
TGAATTTATCAGCTAGAACGGTTGAATATCATATTGATGGTGATTTGACTGTCTCCGGCCTTTCTCAC
CCGTTTGAATCTTTACCTACACATTACTCAGGCATTGCATTTAAAATATATGAGGGTTCTAAAAATTTT
TATCCTTGCGTTGAAATAAAGGCTTCTCCCGCAAAAGTATTACAGGGTCATAATGTTTTTGGTACAAC
CGATTTAGCTTTATGCTCTGAGGCTTTATTGCTTAATTTTGCTAATTTCTTGCCTTGCTGTATGATTTA
TTGGATGTTGGAATCGCCTGATGCGGTATTTTCTCCTTACGCATCTGTGCGGTATTTACACCCGCATA
TGGTGCACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGCCCCGACACCCGCCAACAC
TATGGTGCACTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGCCCCGACACCCGCCAAC
ACCCGCTGACGCGCCCTGACGGGCTTGCTGCTGCCGCGCATCCGCTTACAGACAAGCTGTGACCGT
CTCCGGGAGCTGCATGTGTGACAGGTTTTCTACCGTCATCACCGAAACGCGCGAGACGAAAGGGCCT
CGTGATACGCCTATTTTTATAGGTTAATGTGTCATGATAATAATGGTTTCTTAGACGTCAGGTGGCACTTT
TCGGGGAATGTGCGCGGAACCCCTATTTGTTATTTTTCTAAATACATTCAAATATGTATCCGCTCAT
GAGACAATAACCCCTGATAAATGCTTCAATAATTGAAAAAGGAAGAGTATGAGCCATATTCAACGG
GAAACGTCGAGGCCGCGATTAAATTCCAACATGGATGCTGATTTATATGGGTATAAATGGGCTCGC
GATAATGTCGGGCAATCAGGTGCGACAATCTATCGCTTGATGGGAAGCCCGATGCGCCAGAGTT
GTTTCTGAAACATGGCAAAGGTAGCGTTGCCAATGATGTTACAGATGAGATGGTCAGACTAAACTG
GCTGACGGAATTTATGCCACTTCCGACCATCAAGCATTTTATCCGTACTCCTGATGATGCATGGTTA
CTCACCCTGCGATCCCCGAAAAACAGCGTTCCAGGTATTAGAAGAATATCCTGATTCAGGTGA
AAATATTGTTGATGCGCTGGCAGTGTTCTGCGCCGGTTGCACTCGATTCTGTTGTAATTGTCTT
TTTAACAGCGATCGCGTATTTGCGCTCGCTCAGGCGCAATCACGAATGAATAACGGTTTGTTGAT
GCGAGTGATTTTGATGACGAGCGTAATGGCTGGCCTGTTGAACAAGTCTGGAAAGAAATGCATAA
ACTTTTGCCATTCTACCGGATTGAGTCGTCACCTCATGGTGATTTCTCACTTGATAACCTTATTTTG
ACGAGGGGAAATTAATAGGTTGTATTGATGTTGGACGAGTCGGAATCGCAGACCGATACCAGGAT
CTTGCCATCCTATGGAAGTGCCTCGGTGAGTTTTCTCCTTCATTACAGAAACGGCTTTTTCAAAAAT
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TCAGACCAAGTTTACTCATATATACTTTAGATTGATTTAAACTTCATTTTTAATTTAAAGGATCTAGG
TGAAGATCCTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGAGTTTTCGTTCCACTGAGCGTCA
GACCCCGTAGAAAAGATCAAAGGATCTTCTTGAGATCCTTTTTTCTGCGCGTAATCTGCTGCTTGC
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CGAAGGTAAGTGGCTTCAGCAGAGCGCAGATACCAAATACTGTTCTTCTAGTGTAGCCGTAGTTAG
GCCACCACTTCAAGAACTCTGTAGCACCGCCTACATACCTCGCTCTGCTAATCCTGTTACCAGTGG
CTGCTGCCAGTGGCGATAAGTCGTGCTTACCGGGTTGGACTCAAGACGATAGTTACCGGATAAG
GCGCAGCGGTGCGGCTGAACGGGGGGTTCGTGCACACAGCCAGCTTGGAGCGAACGACCTACA
CCGAAGTGAAGATACCTACAGCGTGAGCTATGAGAAAGCGCCACGCTTCCCGAAGGGAGAAAGGC
GGACAGGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGAGCGCACGAGGGAGCTTCCAGGGGG
AAACGCTGGTATCTTTATAGTCCTGTGCGGTTTCGCCACCTCTGACTTGAGCGTCGATTTTGTGA
TGCTCGTCAGGGGGGCGGAGCCTATGAAAAACGCCAGCAACGCGGCTTTTTACGGTTCCTGGC
CTTTTGCTGGCCTTTTGCTCACATGTTCTTCTGCGTTATCCCTGATTCTGTGGATAACCGTATTAC
CGCCTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGACCGAGCGCAGCGAGTCAGTGAGCG
AGGAAGCGGAAGAGC

FIG. 12A

pAAV.miR106a shRNA.stuffer.Kan



FIG. 12B**pAAV.miR106a shRNA.stuffer.Kan (SEQ ID NO: 22)****ITR****mi-R106a shRNA*****U6 promoter*****stuffer****KanR****Ori**

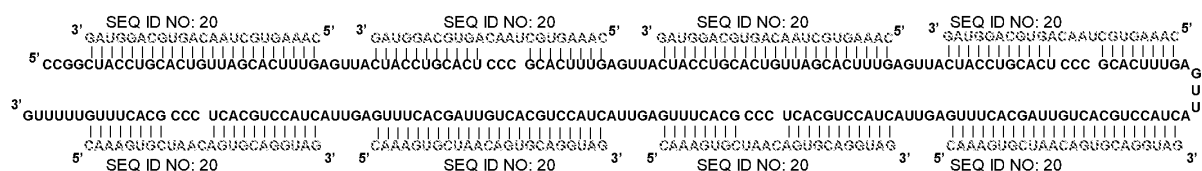
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GGCAAGTGATGTTATTACTAATCAAAGAAGTATTGCGACAACGGTTAATTTGCGTGATGGACAGACTC
TTTTACTCGGTGGCCTCACTGATTATAAAAAACACTTCTCAGGATTCTGGCGTACCGTTCCCTGTCTAAA
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CGTCAAAGCAACCATAGTACGCGCCCTGTAGCGGCGCATTAAAGCGCGCGGGTGTGGTGGTTACG
CGCAGCGTGACCGCTACACTTGCCAGCGCCCTAGCGCCCGCTCCTTTTCGCTTTCTTCCCTTCCCTTTC
TCGCCACGTTTCGCCGGCTTTCCCCGTCAAGCTCTAAATCGGGGGCTCCCTTTAGGGTTCCGATTTAG
TGCTTTACGGCACCTCGACCCCAAAAAAATTGATTAGGGTGATGGTTCACGTAGTGGGCCATCGCCC
TGATAGACGCTTTTTTCGCCCTTTGACGTTGGAGTCCACGTTCTTTAATAGTGGACTCTTGTTCCAAAC
TGGAACAACACTCAACCCTATCTCGGTCTATTCTTTTGATTATAAGGGATTTTGCCGATTTTCGCGCT
ATTGGTTAAAAAATGAGCTGATTAAACAAAAATTAACGCGAATTTTAACAAAATATTAACGCTTACAAT
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TGACATGCTAGTTTTACGATTACCGTTCATCGCCCTGCGCGCTCGCTCGCTCACTGAGGCCGCCCG
GGCAAAGCCCCGGGCGTGGGCGACCTTTGGTCGCCCGGCCCTCAGTGAGCGAGCGAGCGCGCAG
AGAGGGAGTGGAATTCACGCGTGATCTGAATTCATTACGCGTGGTACCGTCTCGAGGTCGAGA
ATTCAAAAATTAGCACTTTGACATGGCCACTCGAGTGGCCATGTCAAAGTGCTAACCGGTGTTTCGT
CCTTTCCACAAGATATATAAAGCCAAGAAATCGAAATACTTTCAAGTTACGGTAAGCATATGATAG
TCCATTTTAAACATAATTTTAAAACTGCAAACCTACCAAGAAATTATTACTTTCTACGTCACGTATT
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TATGCAAATATGAAGGAATCATGGGAAATAGGCCCTCGGTGAAGACTAGTTATTAATAGTAATCAA
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TTTGCGCTGCTTCGCGGCGCGCCTTTTAAGGCAGTTATTGGTGCCCTTAACGCCTGGTGCTACGCC
TGAATAAGTGATAATAAGCGGATGAATGGCAGAAATTCGCCGATCTTTGTGAAGGAACCTTACTTCT
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CCGGCGTCCCGGAAAACGATTCCGAAGCCCAACCTTTTCATAGAAGGCGGCGGTGGAATCGAAATCT
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TCGCCCCATCATCCAGCCAGAAAGTGAGGGAGCCACGGTTGATGAGAGCTTTGTTGTAGGTGGACC
AGTCCTGCAGGAGCATAAAGTGTAAGCCTGGGGTGCTAATGAGTGAGCTAACTCACATTAATT
GCGTTGCGCTCACTGCCCGCTTTCCAGTCCGGGAAACCTGTCGTGCCCGCCAGTCTAGCTATCGC
CATGTAAGCCCACTGCAAGCTACCTGCTTTCTCTTTCGCGCTTGCCTTTTCCCTTGTCCAGATAGCC
AGTAGCTGACATTCATCCGGGTCAGCACCGTTTCTGCGGACTGGCTTTCTACGTGCTGTTTCCA

FIG. 12B Continued

GGCGGGATCAGCCACCGCGGTGGCGGCCTAGAGTCGACGAGGAAC TGAAAAACCAGAAAGTTAA
CTGGCCTGTACGGAAGTGTTACTTCTGCTCTAAAAGCTGCGGAATTGTACCCGCGGCCGATCCAC
CGGTGCGCCACCAGCGGCCATCAAGCACGTTATCGATACCGTCGACTAGAGCTCGCTGATCAGTGG
GGGGTGGGGTGGGGCAGGACAGCAAGGGGGAGGATTGGGAAGACAATAGCAGCTGCAGAAGTT
TAAACGCATGCTGGGGAGAGATCGATCTGAGGAACCCCTAGTGATGGAGTTGGCCACTCCCTCTC
TGCGCGCTCGCTCGCTCACTGAGGCCGGGCGACCAAAGGTCGCCCCGACGCCCGGGCTTTGCCCG
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GATTCTCTTGTGTTGCTCCAGACTCTCAGGCAATGACCTGATAGCCTTTGTAGAGACCTCTCAAAAATA
GCTACCCTCTCCGGCATGAATTTATCAGCTAGAACGTTGAATATCATATTGATGGTGATTTGACTGT
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GGTTCTAAAAATTTTTATCCTTGCGTTGAAATAAAGGCTTCTCCCGCAAAAGTATTACAGGGTCATA
ATGTTTTTGGTACAACCGATTAGCTTTATGCTCTGAGGCTTTATTGCTTAATTTTGCTAATTCCTTGC
CTTGCCTGTATGATTTATTGGATGTTGGAATCGCCTGATGCGGTATTTTCTCCTTACGCATCTGTGCG
GTATTTACACCCGCATATGGTGCCTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAGCC
CCGACACCCGCCAACACTATGGTGCCTCTCAGTACAATCTGCTCTGATGCCGCATAGTTAAGCCAG
CCCCGACACCCGCCAACACCCGCTGACGCGCCCTGACGGGCTTGTCTGCTCCCGGCATCCGCTTA
CAGACAAGCTGTGACCGTCTCCGGGAGCTGCATGTGTGACAGGTTTTACCGTCATCACCGAAACG
CGCGAGACGAAAGGGCCTCGTGATACGCCTATTTTTATAGGTTAATGTCATGATAATAATGTTTCTT
AGACGTCAGGTGGCACTTTTCGGGGAAATGTGCGCGGAACCCCTATTTGTTATTTTTCTAAATACAT
TCAAAATATGTATCCGCTCATGAGACAATAACCCCTGATAAATGCTTCAATAATATTGAAAAAGGAAGAG
TATGAGCCATATTCAACGGGAAACGTCGAGGCCGCGATTAAATTCGAACATGGATGCTGATTATA
TGGGTATAAATGGGCTCGCGATAATGTGCGGCAATCAGGTGCGACAATCTATCGCTTGATGGGA
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GAGATGGTCAGACTAAACTGGCTGACGGAATTTATGCCACTTCCGACCATCAAGCATTTTATCCGT
ACTCCTGATGATGCATGGTTACTCACCCTGCGATCCCCGGAAAAACAGCGTTCCAGGTATTAGAA
GAATATCCTGATTCAAGGTGAAAAATATTGTTGATGCGCTGGCAGTGTTCTGCGCCGGTTGCACTCG
ATTCTGTGTTGTAATTGTCTTTTAAACAGCGATCGCGTATTTTCGCTCGCTCAGGCGCAATCACGAA
TGAATAACGGTTTGGTTGATGCGAGTGATTTTATGACGAGCGTAATGGCTGGCCTGTTGAACAAG
TCTGGAAAGAAATGCATAAACTTTTGCCATTCTCACCAGATTAGTCGTCACCTCATGGTGATTTCTC
ACTTGATAACCTTATTTTTGACGAGGGGAAATTAATAGGTTGATTGATGTTGGACGAGTCGGAAT
CGCAGACCGGATACCAGGATCTTGCCATCCTATGGAAGTGCCTCGGTGAGTTTTCTCTTCATTACA
GAAACGGCTTTTTCAAAAATATGGTATTGATAATCCTGATATGAATAAATTGCAGTTTCATTGATG
CTCGATGAGTTTTTCTAACTGTCAGACCAAGTTTACTCATATATACTTTAGATTGATTTAAAACCTCAT
TTTTAATTTAAAAGGATCTAGGTGAAGATCCTTTTTGATAATCTCATGACCAAAATCCCTTAACGTGAG
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GCGCGTAATCTGCTGCTTGCAAAACAAAAAACCCGCTACCAGCGGTGGTTTGTTTGCCGGATC
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TGCTAATCCTGTTACCAGTGGCTGCTGCCAGTGGCGATAAGTCGTGCTTACCGGGTTGGAATCAA
GACGATAGTTACCGGATAAGGCGCAGCGGTGCGGCTGAACGGGGGGTTTCGTGCACACAGCCCAG
CTTGAGCGGAACGACCTACACCGAACTGAGATACCTACAGCGTGAGCTATGAGAAAGCGCCACG
CTTCCCGAAGGGAGAAAGGCGGACAGGTATCCGGTAAGCGGCAGGGTCGGAACAGGAGAGCGC
ACGAGGGAGCTTCCAGGGGGAAACGCCTGGTATCTTTATAGTCTGTGCGGTTTCGCCACCTCTG
ACTTGAGCGTCGATTTTTGTGATGCTCGTCAGGGGGGCGGAGCCTATGGAAAAACGCCAGCAACG
CGGCCTTTTTACGGTTCCTGGCCTTTTGCTGGCCTTTTGCTCACATGTTCTTTCTGCTTATCCCT
GATTCTGTGGATAACCGTATTACCGCCTTTGAGTGAGCTGATACCGCTCGCCGCAGCCGAACGACC
GAGCGCAGCGAGTCAGTGAGCGAGGAAGCGGAAGAGC

FIG. 13A

Mir106a sp 1 design 1 [SEQ ID NO: 7]

**FIG. 13B**

Mir106a sp 1 design 2 [SEQ ID NO: 3]

CCGGCUACCUGCACUGUUAGCACUUUGAGUUACUACCUGCACUCCCGCACUUUGUUUU
UG

FIG. 13C

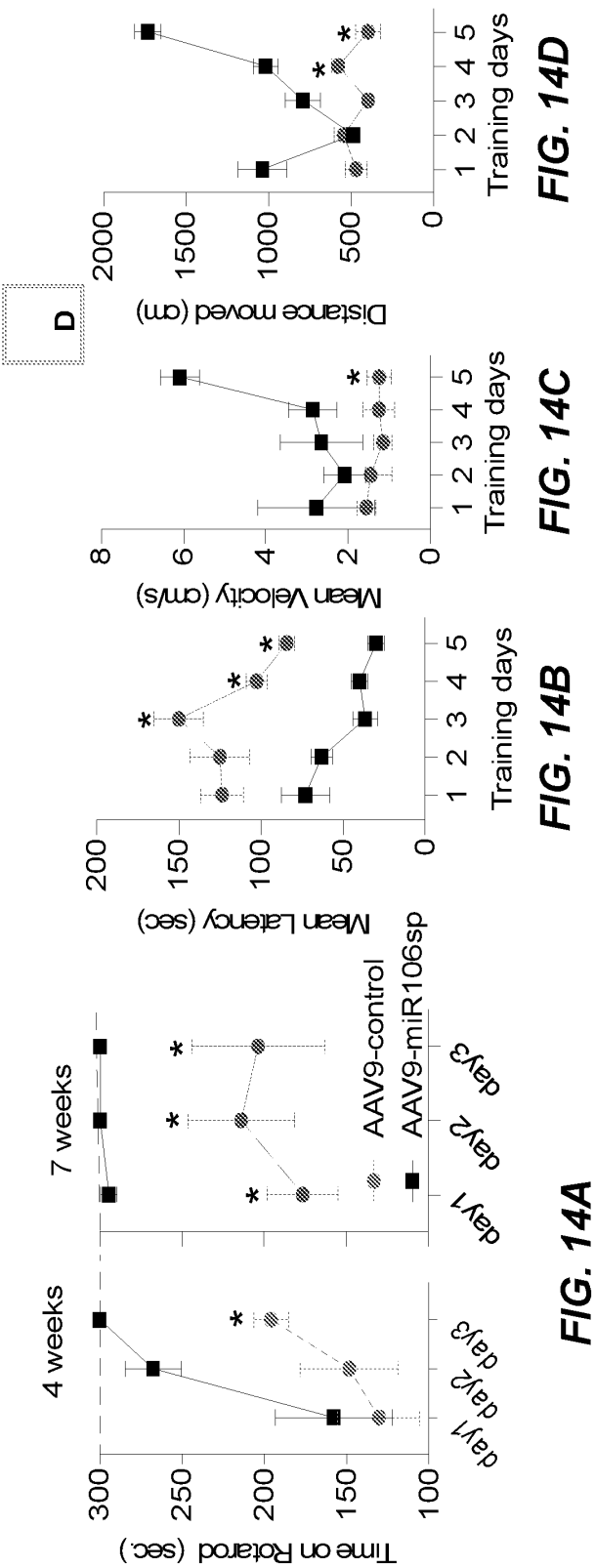
Mir106a sp1 design 3 [SEQ ID NO: 5]

ACCGGCUACCUGCACUGUUAGCACUUUGAGUUACUACCUGCCUGCACUCCCGCACUUUGAGUUA
CUACUGCACUGUUAGCACUGUUAGCACUUUGAGUUACUACCUGCACUCCCGCACUUUGUUUUUAA
UUC

FIG. 13D

shRNA sequence that targets miR106a [SEQ ID NO: 15]





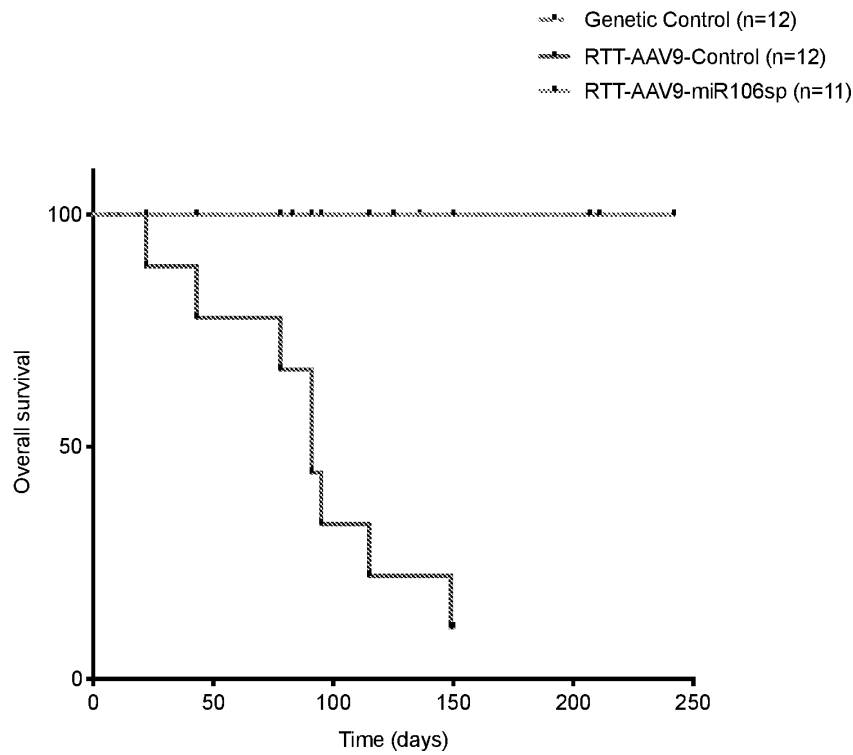


FIG. 15A

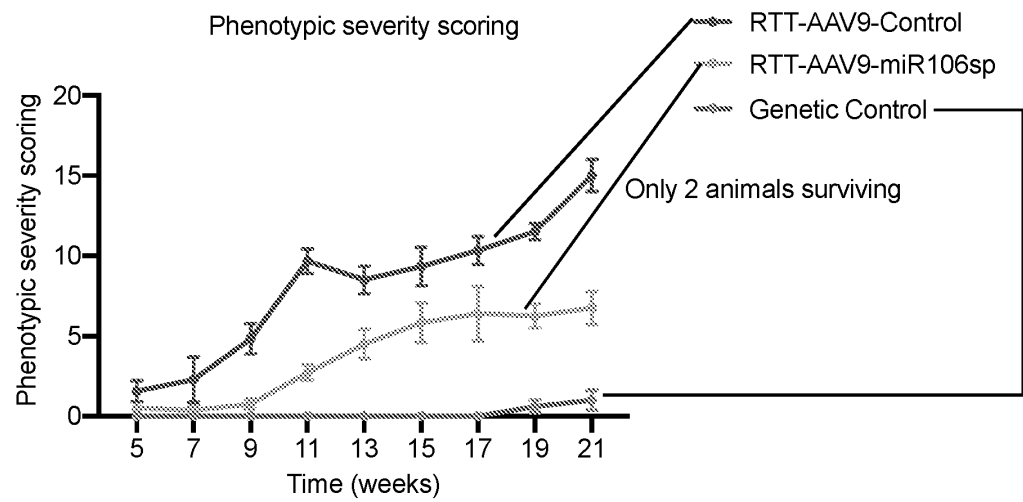
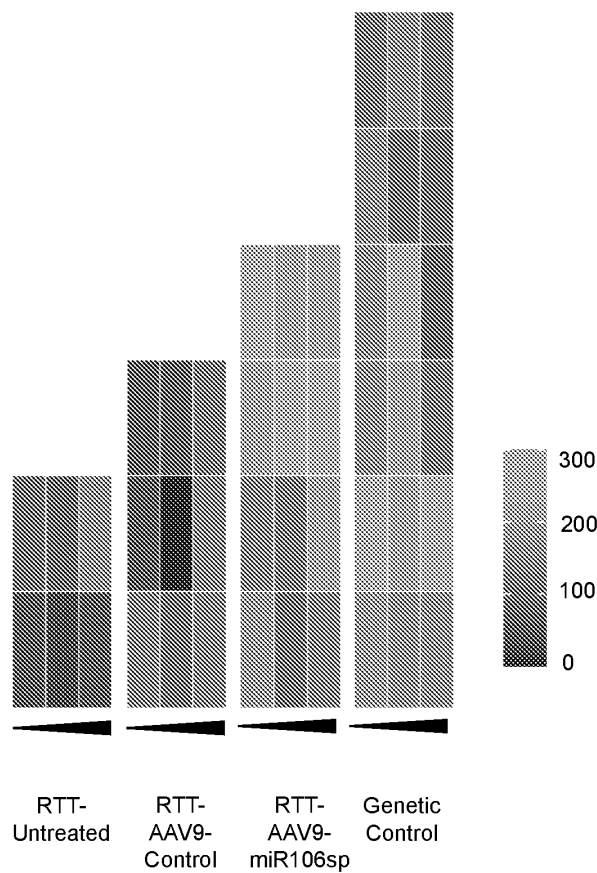


FIG. 15B



16 weeks-old animals

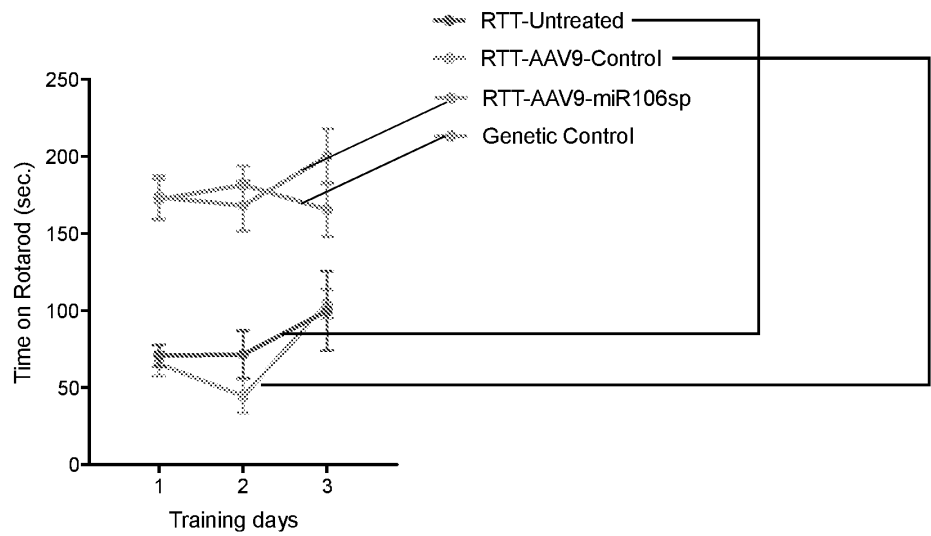


FIG. 15C