SEQUENCE LISTING

<110> RESEARCH INSTITUTE AT NATIONWIDE CHILDREN'S HOSPITAL

<120> ADENO-ASSOCIATED VIRUS VECTOR DELIVERY OF MUSCLE SPECIFIC MICRO-DYSTROPHIN TO TREAT MUSCULAR DYSTROPHY

<130> 28335/51475A PCT

<150> US 62/473,148
<151> 2017-03-17

<160> 5

<170> PatentIn version 3.5

<210> 1
<211> 3579
<212> DNA
<213> Homo sapiens

<400> 1
atgctgtggt gggaggaggt ggaggattgt tatgaaaggg aggacgtgca gaagaagact 60

tttaccaagt gggtgaacgc tcagttcagc aaatttggga agcagcacat cgagaatctg 120

ttttccgacc tgcaggatgg gagacggctg ctggatctgc tggaaggact gactggccag 180

aagctgccca aagagaaggg gagcactagg gtgcacgccc tgaacaacgt gaacaaagct 240

ctgagagtgc tgcagaacaa caacgtggat ctggtgaata ttggcagtac tgatatcgtg 300

gacgggaacc acaaactgac actgggcctg atctggaaca ttattctgca ctggcaggtg 360

aaaaatgtga tgaagaacat catggccggg ctgcagcaga ccaattccga gaagatcctg 420

ctgtcttggg tgcggcagag cacccgcaac tatccccagg tgaacgtgat taacttcact 480

acatcctgga gcgacgggct ggccctgaat gctctgattc acagccacag gcctgatctg 540

ttcgactgga atagcgtggt gtgccagcag tctgccacac agcgcctgga acatgccttc 600

aatatcgctc ggtaccagct ggggatcgaa aaactgctgg acccagagga tgtggacact 660

acatacccag ataaaaagtc tattctgatg tacattacta gcctgttcca ggtgctgcca 720

cagcaggtgt ctattgaagc cattcaggag gtggaaatgc tgccccgccc ccccaaagtg 780

actaaagagg agcattttca gctgcatcat cagatgcatt acagccagca gattaccgtg 840

agcctggctc agggatatga gcgcaccagt agtccaaaac cacggttcaa gtcctacgct 900

tatacccagg ctgcctacgt gacaactagc gaccctacta gatccccctt tccatcccag 960

cacctggagg ccccagagga caagagcttt gggtccagcc tgatggaaag cgaggtgaat 1020

ctggatcggt accagacagc cctggaggag gtgctgagct ggctgctgag tgctgaagac 1080

acactgcagg cccagggcga aatttccaat gacgtggaag tggtgaagga tcagttccac 1140

acacacgagg gctatatgat ggacctgaca gctcaccagg ggcgcgtggg caatatcctg 1200

cagctgggct ctaaactgat cggcaccggg aaactgagtg aggacgagga aacagaagtg 1260

caggagcaga tgaacctgct gaacagccgc tgggagtgtc tgagagtggc tagtatggag 1320

aagcagtcca acctgcaccg ggtgctgatg gacctgcaga accagaaact gaaagagctg 1380

aacgactggc tgacaaagac tgaggaacgc acaaggaaga tggaggagga gccactggga 1440

cccgacctgg aggatctgaa gagacaggtg cagcagcata aggtgctgca ggaggatctg 1500

gaacaggagc aggtgcgggt gaactccctg acacatatgg tggtggtggt ggacgaatct 1560

agtggagatc acgccaccgc cgccctggag gaacagctga aggtgctggg ggaccggtgg 1620

gccaacattt gccggtggac cgaggacagg tgggtgctgc tgcaggacat cctgctgaaa 1680

tggcagaggc tgaccgagga gcagtgtctg tttagtgctt ggctgagcga gaaagaggac 1740

gccgtgaaca agatccacac aaccggcttt aaggatcaga acgaaatgct gtctagcctg 1800

cagaaactgg ctgtgctgaa ggccgatctg gagaaaaaga agcagagcat gggcaaactg 1860

tatagcctga aacaggacct gctgagcacc ctgaagaaca agagcgtgac ccagaagaca 1920

gaagcctggc tggataactt tgcccgctgc tgggacaacc tggtgcagaa actggagaaa 1980

agtacagctc agatctctca ggctgtgacc acaacccagc ctagcctgac ccagacaacc 2040

gtgatggaaa ccgtgaccac cgtgacaacc cgcgaacaga tcctggtgaa acatgcccag 2100

gaagagctgc cacctccacc tccccagaag aagagaaccc tggagcggct gcaggagctg 2160

caggaagcca ctgacgaact ggacctgaag ctgaggcagg ccgaagtgat taaggggtct 2220

tggcagcctg tgggcgatct gctgattgat tccctgcagg accacctgga aaaggtgaag 2280

gctctgagag gcgaaattgc tccactgaag gagaacgtga gtcatgtgaa cgatctggct 2340

agacagctga caacactggg catccagctg agcccataca atctgagcac actggaggac 2400

ctgaatacca ggtggaagct gctgcaggtg gctgtggaag accgggtgcg gcagctgcat 2460

gaggcccatc gcgacttcgg accagccagc cagcactttc tgagcacatc cgtgcagggg 2520

ccctgggaga gggccatttc tcccaacaag gtgccctact atattaatca cgagacccag 2580

accacttgtt gggaccatcc caagatgaca gaactgtacc agtccctggc cgatctgaac 2640

aacgtgaggt ttagcgctta cagaaccgct atgaagctga gacggctgca gaaggccctg 2700

tgcctggatc tgctgtccct gtccgccgcc tgcgatgccc tggatcagca taatctgaag 2760

cagaacgatc agccaatgga tatcctgcag atcatcaact gcctgaccac tatctacgac 2820

aggctggagc aggagcacaa caacctggtg aacgtgcctc tgtgcgtgga tatgtgcctg 2880

aactggctgc tgaacgtgta tgacactggg cgcaccggcc ggatcagagt gctgagtttt 2940

aaaactggga ttatctccct gtgtaaggcc cacctggagg acaagtacag gtacctgttc 3000

aagcaggtgg ctagtagcac tggattttgt gaccagcgcc gcctgggact gctgctgcat 3060

gatagtatcc agattcctag acagctggga gaggtggcta gtttcggagg atctaacatc 3120

gaacccagcg tgcgcagctg tttccagttt gccaataaca aacctgaaat cgaggctgct 3180

ctgttcctgg attggatgcg cctggaacca cagagcatgg tgtggctgcc tgtgctgcac 3240

agagtggctg ccgccgaaac tgccaagcac caggctaaat gcaacatctg caaggaatgt 3300

cccattatcg gctttcgcta caggagtctg aaacatttta actacgatat ttgccagagc 3360

tgcttctttt ccggaagagt ggccaaagga cacaagatgc actaccctat ggtggaatat 3420

tgcaccccaa ctacatctgg cgaagatgtg cgcgattttg ccaaggtgct gaagaataag 3480

tttcggacta agaggtactt cgccaagcac ccccgcatgg ggtatctgcc agtgcagaca 3540

gtgctggaag gagacaatat ggagaccgat acaatgtga 3579

<210> 2
<211> 810
<212> DNA
<213> Adeno-associated virus

<400> 2
gtttaaacaa gcttgcatgt ctaagctaga cccttcagat taaaaataac tgaggtaagg 60

gcctgggtag gggaggtggt gtgagacgct cctgtctctc ctctatctgc ccatcggccc 120

tttggggagg aggaatgtgc ccaaggacta aaaaaaggcc atggagccag aggggcgagg 180

gcaacagacc tttcatgggc aaaccttggg gccctgctgt ctagcatgcc ccactacggg 240

tctaggctgc ccatgtaagg aggcaaggcc tggggacacc cgagatgcct ggttataatt 300

aacccagaca tgtggctgcc ccccccccccc caacacctgc tgcctctaaa aataaccctg 360

tccctggtgg atcccctgca tgcgaagatc ttcgaacaag gctgtggggg actgagggca 420

ggctgtaaca ggcttggggg ccagggctta tacgtgcctg ggactcccaa agtattactg 480

ttccatgttc ccggcgaagg gccagctgtc ccccgccagc tagactcagc acttagttta 540

ggaaccagtg agcaagtcag cccttggggc agcccataca aggccatggg gctgggcaag 600

ctgcacgcct gggtccgggg tgggcacggt gcccgggcaa cgagctgaaa gctcatctgc 660

tctcaggggc ccctccctgg ggacagcccc tcctggctag tcacaccctg taggctcctc 720

tatataaccc aggggcacag gggctgccct cattctacca ccacctccac agcacagaca 780

gacactcagg agccagccag cggcgcgccc 810

<210> 3
<211> 8611
<212> DNA
<213> Adeno-associated virus

<400> 3
gcccaatacg caaaccgcct ctccccgcgc gttggccgat tcattaatgc agctggcgcg 60

ctcgctcgct cactgaggcc gcccgggcaa agcccgggcg tcgggcgacc tttggtcgcc 120

cggcctcagt gagcgagcga gcgcgcagag agggagtggc caactccatc actaggggtt 180

ccttgtagtt aatgattaac ccgccatgct aattatctac gtagccatgt ctagagttta 240

aacaagcttg catgtctaag ctagaccctt cagattaaaa ataactgagg taagggcctg 300

ggtaggggag gtggtgtgag acgctcctgt ctctcctcta tctgcccatc ggccctttgg 360

ggaggaggaa tgtgcccaag gactaaaaaa aggccatgga gccagagggg cgagggcaac 420

agacctttca tgggcaaacc ttggggccct gctgtctagc atgccccact acgggtctag 480

gctgcccatg taaggaggca aggcctgggg acacccgaga tgcctggtta taattaaccc 540

agacatgtgg ctgccccccc ccccccaaca cctgctgcct ctaaaaataa ccctgtccct 600

ggtggatccc ctgcatgcga agatcttcga acaaggctgt gggggactga gggcaggctg 660

taacaggctt gggggccagg gcttatacgt gcctgggact cccaaagtat tactgttcca 720

tgttcccggc gaagggccag ctgtcccccg ccagctagac tcagcactta gtttaggaac 780

cagtgagcaa gtcagccctt ggggcagccc atacaaggcc atggggctgg gcaagctgca 840

cgcctgggtc cggggtgggc acggtgcccg ggcaacgagc tgaaagctca tctgctctca 900

ggggcccctc cctggggaca gcccctcctg gctagtcaca ccctgtaggc tcctctatat 960

aacccagggg cacaggggct gccctcattc taccaccacc tccacagcac agacagacac 1020

tcaggagcca gccagcggcg cgcccaggta agtttagtct ttttgtcttt tatttcaggt 1080

cccggatccg gtggtggtgc aaatcaaaga actgctcctc agtggatgtt gcctttactt 1140

ctaggcctgt acggaagtgt tacttctgct ctaaaagctg cggaattgta cccgcggccg 1200

ccaccatgct gtggtgggag gaggtggagg attgttatga aagggaggac gtgcagaaga 1260

agacttttac caagtgggtg aacgctcagt tcagcaaatt tgggaagcag cacatcgaga 1320

atctgttttc cgacctgcag gatgggagac ggctgctgga tctgctggaa ggactgactg 1380

gccagaagct gcccaaagag aaggggagca ctagggtgca cgccctgaac aacgtgaaca 1440

aagctctgag agtgctgcag aacaacaacg tggatctggt gaatattggc agtactgata 1500

tcgtggacgg gaaccacaaa ctgacactgg gcctgatctg gaacattatt ctgcactggc 1560

aggtgaaaaa tgtgatgaag aacatcatgg ccgggctgca gcagaccaat tccgagaaga 1620

tcctgctgtc ttgggtgcgg cagagcaccc gcaactatcc ccaggtgaac gtgattaact 1680

tcactacatc ctggagcgac gggctggccc tgaatgctct gattcacagc cacaggcctg 1740

atctgttcga ctggaatagc gtggtgtgcc agcagtctgc cacacagcgc ctggaacatg 1800

ccttcaatat cgctcggtac cagctgggga tcgaaaaact gctggaccca gaggatgtgg 1860

acactacata cccagataaa aagtctattc tgatgtacat tactagcctg ttccaggtgc 1920

tgccacagca ggtgtctatt gaagccattc aggaggtgga aatgctgccc cgccccccca 1980

aagtgactaa agaggagcat tttcagctgc atcatcagat gcattacagc cagcagatta 2040

ccgtgagcct ggctcaggga tatgagcgca ccagtagtcc aaaaccacgg ttcaagtcct 2100

acgcttatac ccaggctgcc tacgtgacaa ctagcgaccc tactagatcc ccctttccat 2160

cccagcacct ggaggcccca gaggacaaga gctttgggtc cagcctgatg gaaagcgagg 2220

tgaatctgga tcggtaccag acagccctgg aggaggtgct gagctggctg ctgagtgctg 2280

aagacacact gcaggcccag ggcgaaattt ccaatgacgt ggaagtggtg aaggatcagt 2340

tccacacaca cgagggctat atgatggacc tgacagctca ccaggggcgc gtgggcaata 2400

tcctgcagct gggctctaaa ctgatcggca ccgggaaact gagtgaggac gaggaaacag 2460

aagtgcagga gcagatgaac ctgctgaaca gccgctggga gtgtctgaga gtggctagta 2520

tggagaagca gtccaacctg caccgggtgc tgatggacct gcagaaccag aaactgaaag 2580

agctgaacga ctggctgaca aagactgagg aacgcacaag gaagatggag gaggagccac 2640

tgggacccga cctggaggat ctgaagagac aggtgcagca gcataaggtg ctgcaggagg 2700

atctggaaca ggagcaggtg cgggtgaact ccctgacaca tatggtggtg gtggtggacg 2760

aatctagtgg agatcacgcc accgccgccc tggaggaaca gctgaaggtg ctgggggacc 2820

ggtgggccaa catttgccgg tggaccgagg acaggtgggt gctgctgcag gacatcctgc 2880

tgaaatggca gaggctgacc gaggagcagt gtctgtttag tgcttggctg agcgagaaag 2940

aggacgccgt gaacaagatc cacacaaccg gctttaagga tcagaacgaa atgctgtcta 3000

gcctgcagaa actggctgtg ctgaaggccg atctggagaa aaagaagcag agcatgggca 3060

aactgtatag cctgaaacag gacctgctga gcaccctgaa gaacaagagc gtgacccaga 3120

agacagaagc ctggctggat aactttgccc gctgctggga caacctggtg cagaaactgg 3180

agaaaagtac agctcagatc tctcaggctg tgaccacaac ccagcctagc ctgacccaga 3240

caaccgtgat ggaaaccgtg accaccgtga caacccgcga acagatcctg gtgaaacatg 3300

cccaggaaga gctgccacct ccacctcccc agaagaagag aaccctggag cggctgcagg 3360

agctgcagga agccactgac gaactggacc tgaagctgag gcaggccgaa gtgattaagg 3420

ggtcttggca gcctgtgggc gatctgctga ttgattccct gcaggaccac ctggaaaagg 3480

tgaaggctct gagaggcgaa attgctccac tgaaggagaa cgtgagtcat gtgaacgatc 3540

tggctagaca gctgacaaca ctgggcatcc agctgagccc atacaatctg agcacactgg 3600

aggacctgaa taccaggtgg aagctgctgc aggtggctgt ggaagaccgg gtgcggcagc 3660

tgcatgaggc ccatcgcgac ttcggaccag ccagccagca ctttctgagc acatccgtgc 3720

aggggccctg ggagagggcc atttctccca acaaggtgcc ctactatatt aatcacgaga 3780

cccagaccac ttgttgggac catcccaaga tgacagaact gtaccagtcc ctggccgatc 3840

tgaacaacgt gaggtttagc gcttacagaa ccgctatgaa gctgagacgg ctgcagaagg 3900

ccctgtgcct ggatctgctg tccctgtccg ccgcctgcga tgccctggat cagcataatc 3960

tgaagcagaa cgatcagcca atggatatcc tgcagatcat caactgcctg accactatct 4020

acgacaggct ggagcaggag cacaacaacc tggtgaacgt gcctctgtgc gtggatatgt 4080

gcctgaactg gctgctgaac gtgtatgaca ctgggcgcac cggccggatc agagtgctga 4140

gttttaaaac tgggattatc tccctgtgta aggcccacct ggaggacaag tacaggtacc 4200

tgttcaagca ggtggctagt agcactggat tttgtgacca gcgccgcctg ggactgctgc 4260

tgcatgatag tatccagatt cctagacagc tgggagaggt ggctagtttc ggaggatcta 4320

acatcgaacc cagcgtgcgc agctgtttcc agtttgccaa taacaaacct gaaatcgagg 4380

ctgctctgtt cctggattgg atgcgcctgg aaccacagag catggtgtgg ctgcctgtgc 4440

tgcacagagt ggctgccgcc gaaactgcca agcaccaggc taaatgcaac atctgcaagg 4500

aatgtcccat tatcggcttt cgctacagga gtctgaaaca ttttaactac gatatttgcc 4560

agagctgctt cttttccgga agagtggcca aaggacacaa gatgcactac cctatggtgg 4620

aatattgcac cccaactaca tctggcgaag atgtgcgcga ttttgccaag gtgctgaaga 4680

ataagtttcg gactaagagg tacttcgcca agcacccccg catggggtat ctgccagtgc 4740

agacagtgct ggaaggagac aatatggaga ccgatacaat gtgagcggcc gcaataaaag 4800

atctttattt tcattagatc tgtgtgttgg ttttttgtgt gtctagagca tggctacgta 4860

gataagtagc atggcgggtt aatcattaac tacaaggaac ccctagtgat ggagttggcc 4920

actccctctc tgcgcgctcg ctcgctcact gaggccgggc gaccaaaggt cgcccgacgc 4980

ccgggctttg cccgggcggc ctcagtgagc gagcgagcgc gccagctggc gtaatagcga 5040

agaggcccgc accgatcgcc cttcccaaca gttgcgcagc ctgaatggcg aatggaagtt 5100

ccagacgatt gagcgtcaaa atgtaggtat ttccatgagc gtttttcctg ttgcaatggc 5160

tggcggtaat attgttctgg atattaccag caaggccgat agtttgagtt cttctactca 5220

ggcaagtgat gttattacta atcaaagaag tattgcgaca acggttaatt tgcgtgatgg 5280

acagactctt ttactcggtg gcctcactga ttataaaaac acttctcagg attctggcgt 5340

accgttcctg tctaaaatcc ctttaatcgg cctcctgttt agctcccgct ctgattctaa 5400

cgaggaaagc acgttatacg tgctcgtcaa agcaaccata gtacgcgccc tgtagcggcg 5460

cattaagcgc ggcgggtgtg gtggttacgc gcagcgtgac cgctacactt gccagcgccc 5520

tagcgcccgc tcctttcgct ttcttccctt cctttctcgc cacgttcgcc ggctttcccc 5580

gtcaagctct aaatcggggg ctccctttag ggttccgatt tagtgattta cggcacctcg 5640

accccaaaaa acttgattag ggtgatggtt cacgtagtgg gccatcgccc tgatagacgg 5700

tttttcgccc tttgacgttg gagtccacgt tctttaatag tggactcttg ttccaaactg 5760

gaacaacact caaccctatc tcggtctatt cttttgattt ataagggatt ttgccgattt 5820

cggcctattg gttaaaaaat gagctgattt aacaaaaatt taacgcgaat tttaacaaaa 5880

tattaacgtt tacaatttaa atatttgctt atacaatctt cctgtttttg gggcttttct 5940

gattatcaac cggggtacat atgattgaca tgctagtttt acgattaccg ttcatcgatt 6000

ctcttgtttg ctccagactc tcaggcaatg acctgatagc ctttgtagag acctctcaaa 6060

aatagctacc ctctccggca tgaatttatc agctagaacg gttgaatatc atattgatgg 6120

tgatttgact gtctccggcc tttctcaccc gtttgaatct ttacctacac attactcagg 6180

cattgcattt aaaatatatg agggttctaa aaatttttat ccttgcgttg aaataaaggc 6240

ttctcccgca aaagtattac agggtcataa tgtttttggt acaaccgatt tagctttatg 6300

ctctgaggct ttattgctta attttgctaa ttctttgcct tgcctgtatg atttattgga 6360

tgttggaagt tcctgatgcg gtattttctc cttacgcatc tgtgcggtat ttcacaccgc 6420

atatggtgca ctctcagtac aatctgctct gatgccgcat agttaagcca gccccgacac 6480

ccgccaacac ccgctgacgc gccctgacgg gcttgtctgc tcccggcatc cgcttacaga 6540

caagctgtga ccgtctccgg gagctgcatg tgtcagaggt tttcaccgtc atcaccgaaa 6600

cgcgcgagac gaaagggcct cgtgatacgc ctatttttat aggttaatgt catgataata 6660

atggtttctt agacgtcagg tggcactttt cggggaaatg tgcgcggaac ccctatttgt 6720

ttatttttct aaatacattc aaatatgtat ccgctcatga gacaataacc ctgataaatg 6780

cttcaataat attgaaaaag gaagagtatg agtattcaac atttccgtgt cgcccttatt 6840

ccctttttg cggcattttg ccttcctgtt tttgctcacc cagaaacgct ggtgaaagta 6900

aaagatgctg aagatcagtt gggtgcacga gtgggttaca tcgaactgga tctcaacagc 6960

ggtaagatcc ttgagagttt tcgccccgaa gaacgttttc caatgatgag cacttttaaa 7020

gttctgctat gtggcgcggt attatcccgt attgacgccg ggcaagagca actcggtcgc 7080

cgcatacact attctcagaa tgacttggtt gagtactcac cagtcacaga aaagcatctt 7140

acggatggca tgacagtaag agaattatgc agtgctgcca taaccatgag tgataacact 7200

gcggccaact tacttctgac aacgatcgga ggaccgaagg agctaaccgc ttttttgcac 7260

aacatggggg atcatgtaac tcgccttgat cgttgggaac cggagctgaa tgaagccata 7320

ccaaacgacg agcgtgacac cacgatgcct gtagcaatgg caacaacgtt gcgcaaacta 7380

ttaactggcg aactacttac tctagcttcc cggcaacaat taatagactg gatggaggcg 7440

gataaagttg caggaccact tctgcgctcg gcccttccgg ctggctggtt tattgctgat 7500

aaatctggag ccggtgagcg tgggtctcgc ggtatcattg cagcactggg gccagatggt 7560

aagccctccc gtatcgtagt tatctacacg acggggagtc aggcaactat ggatgaacga 7620

aatagacaga tcgctgagat aggtgcctca ctgattaagc attggtaact gtcagaccaa 7680

gtttactcat atatacttta gattgattta aaacttcatt tttaatttaa aaggatctag 7740

gtgaagatcc tttttgataa tctcatgacc aaaatccctt aacgtgagtt ttcgttccac 7800

tgagcgtcag accccgtaga aaagatcaaa ggatcttctt gagatccttt ttttctgcgc 7860

gtaatctgct gcttgcaaac aaaaaaacca ccgctaccag cggtggtttg tttgccggat 7920

caagagctac caactctttt tccgaaggta actggcttca gcagagcgca gataccaaat 7980

actgtccttc tagtgtagcc gtagttaggc caccacttca agaactctgt agcaccgcgt 8040

acatacctcg ctctgctaat cctgttacca gtggctgctg ccagtggcga taagtcgtgt 8100

cttaccgggt tggactcaag acgatagtta ccggataagg cgcagcggtc gggctgaacg 8160

gggggttcgt gcacacagcc cagcttggag cgaacgacct acaccgaact gagataccta 8220

cagcgtgagc tatgagaaag cgccacgctt cccgaaggga gaaaggcgga caggtatccg 8280

gtaagcggca gggtcggaac aggagagcgc acgagggagc ttccaggggg aaacgcctgg 8340

tatctttata gtcctgtcgg gtttcgccac ctctgacttg agcgtcgatt tttgtgatgc 8400

tcgtcagggg ggcggagcct atggaaaaac gccagcaacg cggccttttt acggttcctg 8460

gccttttgct ggccttttgc tcacatgttc tttcctgcgt tatcccctga ttctgtggat 8520

aaccgtatta ccgggtttga gtgagctgat accgctcgcc gcagccgaac gaccgagcgc 8580

agcgagtcag tgagcgacca agcggaagag c 8611

<210> 4
<211> 564
<212> DNA
<213> Adeno-associated virus

<400> 4
cagccactat gggtctaggc tgcccatgta aggaggcaag gcctggggac acccgagatg 60

cctggttata attaacccag acatgtggct gctccccccc cccaacacct gctgcctgag 120

cctcaccccc accccggtgc ctgggtctta ggctctgtac accatggagg agaagctcgc 180

tctaaaaata accctgtccc tggtgggctg tgggggactg agggcaggct gtaacaggct 240

tgggggccag ggcttatacg tgcctgggac tcccaaagta ttactgttcc atgttcccgg 300

cgaagggcca gctgtccccc gccagctaga ctcagcactt agtttaggaa ccagtgagca 360

agtcagccct tggggcagcc catacaaggc catggggctg ggcaagctgc acgcctgggt 420

ccggggtggg cacggtgccc gggcaacgag ctgaaagctc atctgctctc aggggccccc 480

ccctggggac agcccctcct ggctagtcac accctgtagg ctcctctata taacccaggg 540

gcacaggggc tgcccccggg tcac 564

<210> 5
<211> 8409
<212> DNA
<213> Adeno associated virus

<400> 5
gcccaatacg caaaccgcct ctccccgcgc gttggccgat tcattaatgc agctggcgcg 60

ctcgctcgct cactgaggcc gcccgggcaa agcccgggcg tcgggcgacc tttggtcgcc 120

cggcctcagt gagcgagcga gcgcgcagag agggagtggc caactccatc actaggggtt 180

ccttgtagtt aatgattaac ccgccatgct aattatctac gtagccatgt ctagacagcc 240

actatgggtc taggctgccc atgtaaggag gcaaggcctg gggacacccg agatgcctgg 300

ttataattaa cccagacatg tggctgctcc ccccccccaa cacctgctgc ctgagcctca 360

cccccacccc ggtgcctggg tcttaggctc tgtacaccat ggaggagaag ctcgctctaa 420

aaataaccct gtccctggtg ggctgtgggg gactgagggc aggctgtaac aggcttgggg 480

gccagggctt atacgtgcct gggactccca aagtattact gttccatgtt cccggcgaag 540

ggccagctgt cccccgccag ctagactcag cacttagttt aggaaccagt gagcaagtca 600

gcccttgggg cagcccatac aaggccatgg ggctgggcaa gctgcacgcc tgggtccggg 660

gtgggcacgg tgcccgggca acgagctgaa agctcatctg ctctcagggg cccctccctg 720

gggacagccc ctcctggcta gtcacaccct gtaggctcct ctatataacc caggggcaca 780

ggggctgccc ccgggtcacc accacctcca cagcacagac agacactcag gagccagcca 840

gccaggtaag tttagtcttt ttgtctttta tttcaggtcc cggatccggt ggtggtgcaa 900

atcaaagaac tgctcctcag tggatgttgc ctttacttct aggcctgtac ggaagtgtta 960

cttctgctct aaaagctgcg gaattgtacc cgcggccgcc accatgctgt ggtgggagga 1020

ggtggaggat tgttatgaaa gggaggacgt gcagaagaag acttttacca agtgggtgaa 1080

cgctcagttc agcaaatttg ggaagcagca catcgagaat ctgttttccg acctgcagga 1140

tgggagacgg ctgctggatc tgctggaagg actgactggc cagaagctgc ccaaagagaa 1200

ggggagcact agggtgcacg ccctgaacaa cgtgaacaaa gctctgagag tgctgcagaa 1260

caacaacgtg gatctggtga atattggcag tactgatatc gtggacggga accacaaact 1320

gacactgggc ctgatctgga acattattct gcactggcag gtgaaaaatg tgatgaagaa 1380

catcatggcc gggctgcagc agaccaattc cgagaagatc ctgctgtctt gggtgcggca 1440

gagcacccgc aactatcccc aggtgaacgt gattaacttc actacatcct ggagcgacgg 1500

gctggccctg aatgctctga ttcacagcca caggcctgat ctgttcgact ggaatagcgt 1560

ggtgtgccag cagtctgcca cacagcgcct ggaacatgcc ttcaatatcg ctcggtacca 1620

gctggggatc gaaaaactgc tggacccaga ggatgtggac actacatacc cagataaaaa 1680

gtctattctg atgtacatta ctagcctgtt ccaggtgctg ccacagcagg tgtctattga 1740

agccattcag gaggtggaaa tgctgccccg ccccccaaa gtgactaaag aggagcattt 1800

tcagctgcat catcagatgc attacagcca gcagattacc gtgagcctgg ctcagggata 1860

tgagcgcacc agtagtccaa aaccacggtt caagtcctac gcttataccc aggctgccta 1920

cgtgacaact agcgacccta ctagatcccc ctttccatcc cagcacctgg aggccccaga 1980

ggacaagagc tttgggtcca gcctgatgga aagcgaggtg aatctggatc ggtaccagac 2040

agccctggag gaggtgctga gctggctgct gagtgctgaa gacacactgc aggcccaggg 2100

cgaaatttcc aatgacgtgg aagtggtgaa ggatcagttc cacacacacg agggctatat 2160

gatggacctg acagctcacc aggggcgcgt gggcaatatc ctgcagctgg gctctaaact 2220

gatcggcacc gggaaactga gtgaggacga ggaaacagaa gtgcaggagc agatgaacct 2280

gctgaacagc cgctgggagt gtctgagagt ggctagtatg gagaagcagt ccaacctgca 2340

ccgggtgctg atggacctgc agaaccagaa actgaaagag ctgaacgact ggctgacaaa 2400

gactgaggaa cgcacaagga agatggagga ggagccactg ggacccgacc tggaggatct 2460

gaagagacag gtgcagcagc ataaggtgct gcaggaggat ctggaacagg agcaggtgcg 2520

ggtgaactcc ctgacacata tggtggtggt ggtggacgaa tctagtggag atcacgccac 2580

cgccgccctg gaggaacagc tgaaggtgct gggggaccgg tgggccaaca tttgccggtg 2640

gaccgaggac aggtgggtgc tgctgcagga catcctgctg aaatggcaga ggctgaccga 2700

ggagcagtgt ctgtttagtg cttggctgag cgagaaagag gacgccgtga acaagatcca 2760

cacaaccggc tttaaggatc agaacgaaat gctgtctagc ctgcagaaac tggctgtgct 2820

gaaggccgat ctggagaaaa agaagcagag catgggcaaa ctgtatagcc tgaaacagga 2880

cctgctgagc accctgaaga acaagagcgt gacccagaag acagaagcct ggctggataa 2940

ctttgcccgc tgctgggaca acctggtgca gaaactggag aaaagtacag ctcagatctc 3000

tcaggctgtg accacaaccc agcctagcct gacccagaca accgtgatgg aaaccgtgac 3060

caccgtgaca acccgcgaac agatcctggt gaaacatgcc caggaagagc tgccacctcc 3120

acctccccag aagaagagaa ccctggagcg gctgcaggag ctgcaggaag ccactgacga 3180

actggacctg aagctgaggc aggccgaagt gattaagggg tcttggcagc ctgtgggcga 3240

tctgctgatt gattccctgc aggaccacct ggaaaaggtg aaggctctga gaggcgaaat 3300

tgctccactg aaggagaacg tgagtcatgt gaacgatctg gctagacagc tgacaacact 3360

gggcatccag ctgagcccat acaatctgag cacactggag gacctgaata ccaggtggaa 3420

gctgctgcag gtggctgtgg aagaccgggt gcggcagctg catgaggccc atcgcgactt 3480

cggaccagcc agccagcact ttctgagcac atccgtgcag gggccctggg agagggccat 3540

ttctcccaac aaggtgccct actatattaa tcacgagacc cagaccactt gttgggacca 3600

tcccaagatg acagaactgt accagtccct ggccgatctg aacaacgtga ggtttagcgc 3660

ttacagaacc gctatgaagc tgagacggct gcagaaggcc ctgtgcctgg atctgctgtc 3720

cctgtccgcc gcctgcgatg ccctggatca gcataatctg aagcagaacg atcagccaat 3780

ggatatcctg cagatcatca actgcctgac cactatctac gacaggctgg agcaggagca 3840

caacaacctg gtgaacgtgc ctctgtgcgt ggatatgtgc ctgaactggc tgctgaacgt 3900

gtatgacact gggcgcaccg gccggatcag agtgctgagt tttaaaactg ggattatctc 3960

cctgtgtaag gcccacctgg aggacaagta caggtacctg ttcaagcagg tggctagtag 4020

cactggattt tgtgaccagc gccgcctggg actgctgctg catgatagta tccagattcc 4080

tagacagctg ggagaggtgg ctagtttcgg aggatctaac atcgaaccca gcgtgcgcag 4140

ctgtttccag tttgccaata acaaacctga aatcgaggct gctctgttcc tggattggat 4200

gcgcctggaa ccacagagca tggtgtggct gcctgtgctg cacagagtgg ctgccgccga 4260

aactgccaag caccaggcta aatgcaacat ctgcaaggaa tgtcccatta tcggctttcg 4320

ctacaggagt ctgaaacatt ttaactacga tatttgccag agctgcttct tttccggaag 4380

agtggccaaa ggacacaaga tgcactaccc tatggtggaa tattgcaccc caactacatc 4440

tggcgaagat gtgcgcgatt ttgccaaggt gctgaagaat aagtttcgga ctaagaggta 4500

cttcgccaag caccccccgca tggggtatct gccagtgcag acagtgctgg aaggagacaa 4560

tatggagacc gatacaatgt gagcggccgc aataaaagat ctttattttc attagatctg 4620

tgtgttggtt ttttgtgtgt ctagagcatg gctacgtaga taagtagcat ggcgggttaa 4680

tcattaacta caaggaaccc ctagtgatgg agttggccac tccctctctg cgcgctcgct 4740

cgctcactga ggccgggcga ccaaaggtcg cccgacgccc gggctttgcc cgggcggcct 4800

cagtgagcga gcgagcgcgc cagctggcgt aatagcgaag aggcccgcac cgatcgccct 4860

tcccaacagt tgcgcagcct gaatggcgaa tggaagttcc agacgattga gcgtcaaaat 4920

gtaggtattt ccatgagcgt ttttcctgtt gcaatggctg gcggtaatat tgttctggat 4980

attaccagca aggccgatag tttgagttct tctactcagg caagtgatgt tattactaat 5040

caaagaagta ttgcgacaac ggttaatttg cgtgatggac agactctttt actcggtggc 5100

ctcactgatt ataaaaacac ttctcaggat tctggcgtac cgttcctgtc taaaatccct 5160

ttaatcggcc tcctgtttag ctcccgctct gattctaacg aggaaagcac gttatacgtg 5220

ctcgtcaaag caaccatagt acgcgccctg tagcggcgca ttaagcgcgg cgggtgtggt 5280

ggttacgcgc agcgtgaccg ctacacttgc cagcgcccta gcgcccgctc ctttcgcttt 5340

cttcccttcc tttctcgcca cgttcgccgg ctttccccgt caagctctaa atcgggggct 5400

ccctttaggg ttccgattta gtgatttacg gcacctcgac cccaaaaaac ttgattaggg 5460

tgatggttca cgtagtgggc catcgccctg atagacggtt tttcgccctt tgacgttgga 5520

gtccacgttc tttaatagtg gactcttgtt ccaaactgga acaacactca accctatctc 5580

ggtctattct tttgatttat aagggatttt gccgatttcg gcctattggt taaaaaatga 5640

gctgatttaa caaaaattta acgcgaattt taacaaaata ttaacgttta caatttaaat 5700

atttgcttat acaatcttcc tgtttttggg gcttttctga ttatcaaccg gggtacatat 5760

gattgacatg ctagttttac gattaccgtt catcgattct cttgtttgct ccagactctc 5820

aggcaatgac ctgatagcct ttgtagagac ctctcaaaaa tagctaccct ctccggcatg 5880

aatttatcag ctagaacggt tgaatatcat attgatggtg atttgactgt ctccggcctt 5940

tctcacccgt ttgaatcttt acctacacat tactcaggca ttgcatttaa aatatatgag 6000

ggttctaaaa atttttatcc ttgcgttgaa ataaaggctt ctcccgcaaa agtattacag 6060

ggtcataatg tttttggtac aaccgattta gctttatgct ctgaggcttt attgcttaat 6120

tttgctaatt ctttgccttg cctgtatgat ttattggatg ttggaagttc ctgatgcggt 6180

attttctcct tacgcatctg tgcggtattt cacaccgcat atggtgcact ctcagtacaa 6240

tctgctctga tgccgcatag ttaagccagc cccgacaccc gccaacaccc gctgacgcgc 6300

cctgacgggc ttgtctgctc ccggcatccg cttacagaca agctgtgacc gtctccggga 6360

gctgcatgtg tcagaggttt tcaccgtcat caccgaaacg cgcgagacga aagggcctcg 6420

tgatacgcct atttttatag gttaatgtca tgataataat ggtttcttag acgtcaggtg 6480

gcacttttcg gggaaatgtg cgcggaaccc ctatttgttt atttttctaa atacattcaa 6540

atatgtatcc gctcatgaga caataaccct gataaatgct tcaataatat tgaaaaagga 6600

agagtatgag tattcaacat ttccgtgtcg cccttattcc ctttttttgcg gcattttgcc 6660

ttcctgtttt tgctcaccca gaaacgctgg tgaaagtaaa agatgctgaa gatcagttgg 6720

gtgcacgagt gggttacatc gaactggatc tcaacagcgg taagatcctt gagagttttc 6780

gccccgaaga acgttttcca atgatgagca cttttaaagt tctgctatgt ggcgcggtat 6840

tatcccgtat tgacgccggg caagagcaac tcggtcgccg catacactat tctcagaatg 6900

acttggttga gtactcacca gtcacagaaa agcatcttac ggatggcatg acagtaagag 6960

aattatgcag tgctgccata accatgagtg ataacactgc ggccaactta cttctgacaa 7020

cgatcggagg accgaaggag ctaaccgctt ttttgcacaa catgggggat catgtaactc 7080

gccttgatcg ttgggaaccg gagctgaatg aagccatacc aaacgacgag cgtgacacca 7140

cgatgcctgt agcaatggca acaacgttgc gcaaactatt aactggcgaa ctacttactc 7200

tagcttcccg gcaacaatta atagactgga tggaggcgga taaagttgca ggaccacttc 7260

tgcgctcggc ccttccggct ggctggttta ttgctgataa atctggagcc ggtgagcgtg 7320

ggtctcgcgg tatcattgca gcactggggc cagatggtaa gccctcccgt atcgtagtta 7380

tctacacgac ggggagtcag gcaactatgg atgaacgaaa tagacagatc gctgagatag 7440

gtgcctcact gattaagcat tggtaactgt cagaccaagt ttactcatat atactttaga 7500

ttgatttaaa acttcatttt taatttaaaa ggatctaggt gaagatcctt tttgataatc 7560

tcatgaccaa aatcccttaa cgtgagtttt cgttccactg agcgtcagac cccgtagaaa 7620

agatcaaagg atcttcttga gatccttttt ttctgcgcgt aatctgctgc ttgcaaacaa 7680

aaaaaccacc gctaccagcg gtggtttgtt tgccggatca agagctacca actcttttc 7740

cgaaggtaac tggcttcagc agagcgcaga taccaaatac tgtccttcta gtgtagccgt 7800

agttaggcca ccacttcaag aactctgtag caccgcgtac atacctcgct ctgctaatcc 7860

tgttaccagt ggctgctgcc agtggcgata agtcgtgtct taccgggttg gactcaagac 7920

gatagttacc ggataaggcg cagcggtcgg gctgaacggg gggttcgtgc acacagccca 7980

gcttggagcg aacgacctac accgaactga gatacctaca gcgtgagcta tgagaaagcg 8040

ccacgcttcc cgaagggaga aaggcggaca ggtatccggt aagcggcagg gtcggaacag 8100

gagagcgcac gagggagctt ccagggggaa acgcctggta tctttatagt cctgtcgggt 8160

ttcgccacct ctgacttgag cgtcgatttt tgtgatgctc gtcaggggggg cggagcctat 8220

ggaaaaacgc cagcaacgcg gccttttac ggttcctggc cttttgctgg ccttttgctc 8280

acatgttctt tcctgcgtta tcccctgatt ctgtggataa ccgtattacc gggtttgagt 8340

gagctgatac cgctcgccgc agccgaacga ccgagcgcag cgagtcagtg agcgaccaag 8400

cggaagagc 8409