**pD5H8 vector sequence**

**This sequence is an approximation of the vector pieced together from various descriptions. The Cbs regions are functional and the NotI site in the 3' NTS is good for insertion.Otherwise, if absolute sequence is needed, the region of interest should be sequenced. Base numbers of various features are approximate.**

**Color coded sequence:**

**3’rDNA flanking sequence 1-133 red**

**pIC19 vector 134 – 2835 blue**

**5’rDNA flanking sequence 2835 - 4045**

**rDNA 4046 – 14470 (4004? according to Yao paper)**

 **17s 6581 – 8333,red G (8286) is mutation in 17s conferring Pm resistance,in wild type it is an A**

 **5.8s 8464 – 8621**

 **26s 8795 – 12554**

**NotI site 12899 (only unique site in inserted MCS in 3’ NTS) contained in an inserted short MCS from pHSS6. RED UNDERLINED yellow boxes are 3’and 5’ CBS (2 at 5’ end in opposite orientation of 3’). THIS SEQUENCE BOUNDED BY THE CBS FORM THE LINEAR MIC RDNA FOLLOWING PIC 19 REMOVAL BY CBS EXCISION.**

**1 ttttaactta tttttaaaaa ttaaaccaac** **ctctttgttt atttaaatat aatttatttt**

 **61 taattaattc atttattgat aatgcataag tagcatattt ttaatacatt attgataatt**

 **121 ttctgttact aatagcttgg ctgcaggtcg acggatcccc gggaattcat cgatatctag**

 **181 atctcgagct cgcgaaagct tggcactggc cgtcgtttta caacgtcgtg actgggaaaa**

 **241 ccctggcgtt acccaactta atcgccttgc agcacatccc cctttcgcca gctggcgtaa**

 **301 tagcgaagag gcccgcaccg atcgcccttc ccaacagttg cgcagcctga atggcgaatg**

 **361 gcgcctgatg cggtattttc tccttacgca tctgtgcggt atttcacacc gcatatggtg**

 **421 cactctcagt acaatctgct ctgatgccgc atagttaagc cagccccgac acccgccaac**

 **481 acccgctgac gcgccctgac gggcttgtct gctcccggca tccgcttaca gacaagctgt**

 **541 gaccgtctcc gggagctgca tgtgtcagag gttttcaccg tcatcaccga aacgcgcgag**

 **601 acgaaagggc ctcgtgatac gcctattttt ataggttaat gtcatgataa taatggtttc**

 **661 ttagacgtca ggtggcactt ttcggggaaa tgtgcgcgga acccctattt gtttattttt**

 **721 ctaaatacat tcaaatatgt atccgctcat gagacaataa ccctgataaa tgcttcaata**

 **781 atattgaaaa aggaagagta tgagtattca acatttccgt gtcgccctta ttcccttttt**

 **841 tgcggcattt tgccttcctg tttttgctca cccagaaacg ctggtgaaag taaaagatgc**

 **901 tgaagatcag ttgggtgcac gagtgggtta catcgaactg gatctcaaca gcggtaagat**

 **961 ccttgagagt tttcgccccg aagaacgttt tccaatgatg agcactttta aagttctgct**

 **1021 atgtggcgcg gtattatccc gtattgacgc cgggcaagag caactcggtc gccgcataca**

 **1081 ctattctcag aatgacttgg ttgagtactc accagtcaca gaaaagcatc ttacggatgg**

 **1141 catgacagta agagaattat gcagtgctgc cataaccatg agtgataaca ctgcggccaa**

 **1201 cttacttctg acaacgatcg gaggaccgaa ggagctaacc gcttttttgc acaacatggg**

 **1261 ggatcatgta actcgccttg atcgttggga accggagctg aatgaagcca taccaaacga**

 **1321 cgagcgtgac accacgatgc ctgtagcaat ggcaacaacg ttgcgcaaac tattaactgg**

 **1381 cgaactactt actctagctt cccggcaaca attaatagac tggatggagg cggataaagt**

 **1441 tgcaggacca cttctgcgct cggcccttcc ggctggctgg tttattgctg ataaatctgg**

 **1501 agccggtgag cgtgggtctc gcggtatcat tgcagcactg gggccagatg gtaagccctc**

 **1561 ccgtatcgta gttatctaca cgacggggag tcaggcaact atggatgaac gaaatagaca**

 **1621 gatcgctgag ataggtgcct cactgattaa gcattggtaa ctgtcagacc aagtttactc**

 **1681 atatatactt tagattgatt taaaacttca tttttaattt aaaaggatct aggtgaagat**

 **1741 cctttttgat aatctcatga ccaaaatccc ttaacgtgag ttttcgttcc actgagcgtc**

 **1801 agaccccgta gaaaagatca aaggatcttc ttgagatcct ttttttctgc gcgtaatctg**

 **1861 ctgcttgcaa acaaaaaaac caccgctacc agcggtggtt tgtttgccgg atcaagagct**

 **1921 accaactctt tttccgaagg taactggctt cagcagagcg cagataccaa atactgtcct**

 **1981 tctagtgtag ccgtagttag gccaccactt caagaactct gtagcaccgc ctacatacct**

 **2041 cgctctgcta atcctgttac cagtggctgc tgccagtggc gataagtcgt gtcttaccgg**

 **2101 gttggactca agacgatagt taccggataa ggcgcagcgg tcgggctgaa cggggggttc**

 **2161 gtgcacacag cccagcttgg agcgaacgac ctacaccgaa ctgagatacc tacagcgtga**

 **2221 gctatgagaa agcgccacgc ttcccgaagg gagaaaggcg gacaggtatc cggtaagcgg**

 **2281 cagggtcgga acaggagagc gcacgaggga gcttccaggg ggaaacgcct ggtatcttta**

 **2341 tagtcctgtc gggtttcgcc acctctgact tgagcgtcga tttttgtgat gctcgtcagg**

 **2401 ggggcggagc ctatggaaaa acgccagcaa cgcggccttt ttacggttcc tggccttttg**

 **2461 ctggcctttt gctcacatgt tctttcctgc gttatcccct gattctgtgg ataaccgtat**

 **2521 taccgccttt gagtgagctg ataccgctcg ccgcagccga acgaccgagc gcagcgagtc**

 **2581 agtgagcgag gaagcggaag agcgcccaat acgcaaaccg cctctccccg cgcgttggcc**

 **2641 gattcattaa tgcagctggc acgacaggtt tcccgactgg aaagcgggca gtgagcgcaa**

 **2701 cgcaattaat gtgagttagc tcactcatta ggcaccccag gctttacact ttatgcttcc**

 **2761 ggctcgtatg ttgtgtggaa ttgtgagcgg ataacaattt cacacaggaa acagctatga**

 **2821 ccatgattac gccatcgaaa aaataatata tcctcccatg tagacctccc ataaaaaact**

 **2881 cagatttcat ttttcaaggt gaatatatga ggcatattca agtatttgat atgaaaaaaa**

 **2941 gtaaaaagtc taagtctcgc taacagcaaa tatgagtttg tttttgcttt gattttaata**

 **3001 aatacaaaat aacaaatatt aaacaaaata gagctgtata ttatgcctaa ccaattaaat**

 **3061 gccatttatt aagcaaaatt atagtgttta aatacaatca tatagttaca aaaatgtttg**

 **3121 aggttagcta gattttgtct agagtactta atctcacttt ccagataagt ctactttaat**

 **3181 aataatttca ttatattaca aacaaacaaa taattataat ttaaatttta atctgaataa**

 **3241 actcgataaa atggaagcaa aaacttccac ttctaatcct tgattttaat tatactatat**

 **3301 tataaatatg aattgaaaaa tctaatgtat gctttaactt atatagatat ataaatatta**

 **3361 tttcttgtaa ttcttataaa cgattgtttt atatatctaa attattatta cttaatatta**

 **3421 atcataatgt ttgatttctg atgcaaacct taacaaaaat ccaacaaata ttttatttaa**

 **3481 aaacaaatgt atttgttcac ttcatatata tgaaaaaata atagaatttc aatactaaat**

 **3541 taaataccaa gataaaattc ttaaattaat ttttttttta tcagttataa aaatagtgtt**

 **3601 tcatgtaaat aaaattaaaa tatttttaaa atataaattt aatccaatat tactaactaa**

 **3661 atagataaaa atagttaatt ataaatatat taataagcac tttaagtaaa agaatatttt**

 **3721 tcttttattt tatttaaatt aatttaaaaa taaattcaaa aattatataa tggctttaaa**

 **3781 ttttgataat aaataagaaa gaatatttaa aattataatt ttaataaaat gagaacaaac**

 **3841 aaattaaata ttgtaatttc taatttaatt agattttcaa aataaatgag gttggtttat**

 **3901 ttcaatcaat gattaaattt atattaaaga aagaggttgg tttatttcaa tcaaaaatta**

 **3961 aatttatatt aaagaaagag gttggtttat taatattaaa agcgattttc gaaggtaaaa**

 **4021 ttcaacaaca tagtgctgaa ggctagtttt tttgcttttt gttgttagtt ttatagcctt**

 **4081 cagcactatg ttgttgaatt ttaccttcga aaatcactta aaattgagta ataattgggt**

 **4141 ttaaaattta aatttgagta gataagaatt agatgtttat attctgctaa tttcactggt**

 **4201 gaaaatgtag caaatagaaa ttattttaat ctaataaact agcaaatagt atttaaaaca**

 **4261 aaaatatttg ttttttatgt tgtaaaatgt tttaaattag ataaaattta caaatttaca**

 **4321 aattttcaag caaaataggt tctaaaaaat gagaaaatat tacatatttt agctatttga**

 **4381 ctactttaat gctagtaaat taaaatgaat ttaattcatt ttcactttaa aacacttatt**

 **4441 ttaataaaat atatgatttt aaaatgataa aatatttttt aagaggtaaa tttaagaaat**

 **4501 tagttaaatt ttaaagaaaa agcatctaaa aatggacaaa aatgaagtat ttcctttttt**

 **4561 tatacattta aatgctagaa aatttaagta aaacatttat aaataaaagt aaaatagttt**

 **4621 taggaatatg agtaaatagt tttttttatg taaaaaacat tttatcaatt tcatttattc**

 **4681 attttagtta aatttttcat tcacaaaaaa cttttttttg gtaaaataaa gactttataa**

 **4741 agataactta aagaaaaagt ttatctagaa ttaaaaatat tgattttgaa aattgctcat**

 **4801 tagatatttt tttggcaaaa aaaaaaacaa aaatagtaaa aaatcacttt ttttgagagt**

 **4861 tgaaaaaaag acttagaaaa aattttaaaa gtgtaaaaaa agacttagag aaaaaatcaa**

 **4921 aaagagataa aaagacttag agaaaattta taaattaaaa atgatagaaa agtaaaattt**

 **4981 attttatatt ttttaatcat ttaaatgcta gtaaatttaa ataaaacata tataaaaaaa**

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 **5101 atttcattta ttcattttag ttaaatttta cattcaaaat aaattttttt tgattaaata**

 **5161 aagagttata aagagaactt aaagaaaaag tttatctaga attaaaaata ttgattttga**

 **5221 aaattgctca ttagaaattt ttttggcaaa aaaaaaaaca aaaatagtaa acttagaaaa**

 **5281 atttttgaaa aatgaaaaaa aaagacttag agaaaaaaat caaaaagtga aaaaagactt**

 **5341 agaaaaattt ttaaaaatga aaaaatgatt taggagaaat tttgagattg cgcttagatt**

 **5401 ttgtgtgaag ccacttacaa aaaatgagcg gactcgctca aatatttaag tggactcgca**

 **5461 taaaaatgag tggagtcact aaaaaaatta agtgaactca cttaaaaatg agtggagcca**

 **5521 ctcaaaaaat taagcggact cgcttaatat tcgcggagtt aaacaaaaat aagtggactc**

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 **5641 ctcgcttaaa aatgagtgga gccactcaaa aagttcagca gagccactta aaaatttagc**

 **5701 ttaaaatcag ctctaaatta aattagactt agtgaaaaat agcgaaaatg aaaaaaatga**

 **5761 aaaaatgaat gaaaactgaa aaatttacaa gggattgaaa attttggcag agtctttttt**

 **5821 ttggcaaaaa aaaaaacaaa aatagtaaac cttccgaact tttttgactt tgagaaaaat**

 **5881 tctttggcaa aaaaaataaa aataatatca ggggggtaaa aatgcatatt taagaagggg**

 **5941 aaacatctcc ggatcaaaaa taaaatatca gctcgatttg agcttcagta agatttcctt**

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 **6121 tattagagca aatggcctga ctgaaatttt catgaaggct gtaaattcac tgcaaagctt**

 **6181 cgcagaaact tttcccagtg acacttgttg tatcgatatc tatgcagata ttgttacaaa**

 **6241 taacgcaaca cgctagtact gttataaatc ggtgaaatcg cagatgttat taacagctag**

 **6301 caacaaagtt gactagagtc gaagagatgc gatagagttt tctcattgtg ccttcgaaga**

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 **6541 atgcaaatcg gaaaatagcg agcaaatttt gaggatagta acctggttga tcctgccagt**

 **6601 tacatatgct tgtcttaaat attaacccat gcatgtgcca gttcagtatt gaacagcgaa**

 **6661 actgcgaatg gctcattaaa acagttatag tttatttgat aattaaagat tacatggata**

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 **8941 gtaatctaaa gggtcaacct gaaactaagc tcctctcata agttccttgg gacaggacgt**

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 **9301 aaatggtaca gaacttgcta caccggtcag aagacaaaat gggttcagat tgaaggagtc**

 **9361 acctgagatc gggcagcaat gcagatcaaa aggaaaactt caaactggac tgaggggcct**

 **9421 aagggcgatt ttgtcaaaat ggcttctact gacccgtctt gaaacacgga ccaaggagtc**

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 **9601 gagcttaatt gttaggaccc gaaagatggt gaactacgct tgaatagggt gaagccaggg**

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 **9961 gcgatgaggg atgaacctaa cgttgagata aggcgcccaa atgcacgctc atcagatacc**

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 **10081 aggagtgtgt aacaactcac ctgccgaatg aactagccct gaaaatgaat ggcgctgaag**

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 **10321 aacagcaatt gttcatgggt tactcgatcc taagacatag gttaactcct tgcaatacaa**

 **10381 gaagacattc gttttcgttg tcaaaaggga atgaggttaa tattcctcaa gctggacgtg**

 **10441 gtataggcgg taacgcaaag aaacccggaa acgtcagcag gtgtcactgg aagagttatc**

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 **10621 gggggagaca taatttcacg ccagttcgta cccataaccg catcaggtct ccaaggttag**

 **10681 cagcctctgg tccatagaac aatgtagata agggaagtcg gcaaattgga tccgtaactt**

 **10741 cgggataagg attggctctg aggatcgggt ataaaggctt tgtaatgata tccaagcttg**

 **10801 tttgttagtg tggcaacatg ctgatagact tgcgaacgat gaatttgcaa ggtaggtttc**

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 **10921 gtttaataaa aacaaagcat tgtgacggcc tcaacaggtg atgacacaat gtgatttctg**

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 **11101 ctggtagcta gtctttaaac caatagattg catcggttta aaaggcaaga ccgtcaaatt**

 **11161 gcgggaaagg ggtcaacagc cgttcagtac caagtctcag gggaaacttt gagatggcct**

 **11221 tgcaaagggt atggtaataa gctgacggac atggtcctaa ccacgcagcc aagtcctaag**

 **11281 tcaacagatc ttctgttgat atggatgcag ttcacagact aaatgtcggt cggggaagat**

 **11341 gtattcttct cataagatat agtcggacct ctccttaatg ggagctagcg gatgaagtga**

 **11401 tgcaacactg gagccgctgg gaactaattt gtatgcgaaa gtatattgat tagttttgga**

 **11461 gtactcgtaa ggtagccaaa tgcctcgtca tctaattagt gacgcgcatg aatggattaa**

 **11521 tgagattacc actgtcccta tctactatct agcgaaccca cagctaaggg aacgggctta**

 **11581 gaataatcag cggggaaaga agaccctgtt gagcttgact ctagtctaac tttgtgaaat**

 **11641 ggcacgtggg gtatagccta ggtgggagag caatcgatcc tgtaaaacca ctacccacgt**

 **11701 agtcattttg cttatttcgt gaagaaaaga ctggtgcaaa ccagttctaa gattaaggtc**

 **11761 atttattgac tgattttgcg aagacatggt taggggggga gtttgtctgg ggcggaatgc**

 **11821 ctgttaaacc ataacgcagg cgtcctaagt gtagctcagt gagaacggaa atctcacgta**

 **11881 gaacaaaagg gtaaaagcta cattgatttt gattttcagt aggaatacaa accgcgaaag**

 **11941 cgtggcctat cgatccttta actttacaag ttttaagcta gaggtgtcag aaaagttacc**

 **12001 acagggataa ctggcttgtg gcagccaaga gttcatatcg acgttgcttt ttgatccttc**

 **12061 gatgtcggct cttcctatca ttgtgaagca gaattcacaa cggtgtcgga ttgttcaccc**

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 **12181 gatgaaacga tgttgcgaca gtaatttaag ttagtacgag aggaacactt aaatcagata**

 **12241 attggtaaat acggttgtct gaaaagacaa tgccgtgaag ctaccatctg ttggattatg**

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 **12481 ggaacgggta ttgtaagcat gagagtagaa tttctacgat ctgctgagat tcagcccgtc**

 **12541 tccttagatt tatctcatct ccctttattt tttacttctg ctggggttgt taacctcttt**

 **12601 aagaaatttt ttatgttttg atttgtttaa tttaattttg tttaacttta gtaaattttt**

 **12661 ttcctttttt cactcactgg gttattaaat acttagagat tttacatttt atcaaataat**

 **12721 ttatgaactc attaaaacaa aacaaaacaa agttaaaaaa aactcaatag atttgctaat**

 **12781 aagatgcaaa** **gcagctatga ggcaattttt ctcatttgga aagcttaagc ttctagagat**

 **12841 cttccatacc taccagttct ccgcctgcag caatggcaac aacgttgccc ggatccgcgg**

 **12901 ccgcggaatt ctcatgtttg acagcttatc atcgatcaat caactgctta taaataaatt**

 **12961 ataaatcaat attaaaaatg ttaaagtttt atgttatttg ttagtaaaaa aattgaatag**

 **13021 ttgtgtttaa gctgatataa gtctttatgc atgatatgtt aaaagttacg cttaaaatta**

 **13081 tgctttttac gcagaatgag cttagctaaa ttttttctca aagtaaattt tttttaatgc**

 **13141 aaaatgaatg aaaaaatttt agtattttat aaaaattctt cattcaaatt ttacccactt**

 **13201 atcaatttat ttttttttgt gactaaagca gtcccagagc ctttctctaa aagttgaatt**

 **13261 ttattaacaa tgccactttt atagaaaatt ttgcatggat ttcctggggc tccaatggaa**

 **13321 aaattgcgaa agtggatttg aatgaaaaag tgaatgtaaa aattaaagta aaattttgct**

 **13381 ttataaaatg aatgaaaatt taaaacaagc aaaatgaatg aaaaaatctt tgcattttaa**

 **13441 caaaattttt cattcaaaat ttcacccact tatcaatact tttttttctc cagccgtcaa**

 **13501 agacctatat tgttttccta aaagttgact tttattaaga aacaaaatga atgaaaaaat**

 **13561 ctttgtattt taacaaaatt tttcattcaa aatttcaccc acttatcaat atattttttt**

 **13621 taagtcctgc ctgcaggcta atattctttc ctaaaagttg acttttatta agaagcaaaa**

 **13681 tgaatgaaaa aatctttgta ttttaaccaa atttttcatt caaaatttca cccacttatc**

 **13741 aatatttttt ttgggaccaa accaaaagac ctaaagattt gatttaaaaa gttgactttt**

 **13801 ttcaagaaaa ccactttatt agataaatct cttttttacc acggcttgtc caatgaataa**

 **13861 tttgctaaag tggatttgaa taaaaatttt tttgcgtgta aaaatgcgct aaactacgct**

 **13921 tagattttaa ctttatccca ctttaatttc aagcgtaaaa ataaaaatcc cacacaaaaa**

 **13981 ttaagtggaa attgatgcaa aaatttcact aaaatttaat tcaataaata tgtaaaaatg**

 **14041 gttgatctct ataatttatg agatttgcat tatttaaggc ttataagaaa ttttaaattt**

 **14101 aacgcggaag cttcattttt agataaaatt tattaatcat cattaatttc ttgaaaaaca**

 **14161 ttttatttat tgatctttta taacaaaaaa cccttctaaa agtttatttt tgaatgaaaa**

 **14221 acttataaaa atttatgaaa actacaaaaa ataaaatttt taattaaaat aattttgata**

 **14281 agaacttcaa tctttgacta gcttagtcat ttttgagatt taattaatat tttatgttta**

 **14341 ttcatatata aactattcaa aatattatag aatttaaaca ttttaacatc ttaatcattg**

 **14401 ataaataacc aaaaatcaaa gtattacatc aataaataac ttttactcaa tgtcaaagaa**

 **14461 attattgggg**