



cgttggtacgttccagatgctgcagggcgtcggcctgagccaccgcagacaggatggtgaccaccatftttccatggtcccctctgactgatgcc  
 atcatccagaaaaaggatggccacgccatgctcgaactcttggatgagctgaatcatgctccgagatgctgcacctaagtgtaagtttttac  
 caagacaacatgcctcttcgacctgagccgcagcagcttgaggccttcgcgggtcacatgactgccgagacctgtcagtaaaaaatcctgct  
 gcgctgacgtttcagcctgagcgcgtttatctgtacgtcaagggactgttggctggtggagacggggcataacaaaaagtcgcatgggaaat  
 gtctcataagtcgattatagatccccgtctacgaagtataagcaaacgaattatagacgtgtgtggaggatcattttaccgtgccacaaactatg  
 agtaaggagactgcatgccacgctcgtcgtcgttcttcccttgcggagcgggaaagcttactggcgttgcagattcccaagatgaaatgattcgtca  
 ctacttttcagcgaaccgacctcgcacatccgccaacggcgtgggtcgtgcaaatcggctgggcttgcgtgtacagctctgttacatgcgctat  
 cccggggtaacactgctatggatgaagaaccatcgcagccattgctgcgcttggggccacgcaactgaaggtgccgcctgaagcatgggctg  
 actatgggcaacgcgccgagacgcgccgcgagcactgttggaaattacaagctctttttagttcagccattcacacaagacattatcgtccctg  
 cgtcatagtttgatgaactggcatggcagtcggacaaggctcgtgttggcgacggagttggttgaagggttgcgacgacagaacatattgctt  
 ccatcaccaggtgtgatcgcgacttgtgctgaggcaatcaccgcgcaatcggcggatctatgaagccttgcggagcctcttcgaataca  
 caccgccgttgcctcgtggcctccttagacgccgagacaaggccagaccacctggttggcctggttacgccagtcgccagttaaaccgaactc  
 acggcacatgcttgaacacatcgcagcgcctcaaagcatggcaggctctcgtatcaccagcaggcattgagcggctggtcaccagaatcgcctg  
 ctcaaaattgccgtgaaggcggccaaatgacacctgctgacttgcgaatcgaattgcaacgacgctacgctacccttggcactggccatc  
 gagggcatggccaccgtcactgacgaaatcatcactgcacgatcgtatcctgggcaagctgttaacgcagccaagaataaacaccagaaac  
 agttccaggcatccggaaaagcgaatcaacgaaaaggtgcgaatttatggacgatcggccaagccctgctggaggccaagcaaacggctgcg  
 atccgttctgctccatcgaagcggctatgcttgggaggcttccgcaagagtgctaccgaagcgaaaaaacttgcacagcccgaagacttcgact  
 tctgcaccgcacggcgagagctacgccacgttgcgccctatgctccgcagttctcgcagctactcaagctgcgggctgcgccgcagccaa  
 ggacgtgttgaaggcattgaggtattgcgcgcaatgaactgacaacgccgtaaggttccgctcgtatgccccgatcgggtcatcaagaagc  
 gctggaagaaactggtataaccgacggcggtatcaccggcgctactacgaactgtcgtgatgctggaactaaagaacgcgctgcgctctgg  
 agatatttgggtgcagggatcgcgctcagttcaaggacttcgaggattacctgatgccatccgagaattcggccatctcaagctggccatgaattg  
 cctctggcgtagccaccgactgcgacaaatacctgaacgaccggtgacgctgttggaaagctcagcttgcaccgtgaaccgcatggctctagc  
 caatgacttaccggatgccatcatcaccgagctggttgaagatcacgcctctggatgcggcagtgccagataccgcacaggcgttgattgatca  
 aaccgcaatggctatccgcatacaagatcaccgaaattgttggaggtggacgagtgacaggtaccaccggcatttcgcacatctgaaatc  
 gggtagctggccaaggataagcacttactgttccaccatcctggctgatgcgatcaacctaggcctggctaaaatggccgagcttgcctgg  
 caccacctacgcaaaactgtcctggctacaagcctggcacatccgtgacgaaacctattcggccgctggctgagctagtaaacgcgagctc  
 caacatccttttcaagcattggggtgacgggtaccacatcatcgtcagatggacagaattcagaactggcagcaaaagccgagagtacgggtcac  
 atcaatcccaaacggcagcagcccgggacgaactttttacaccacatttctgaccagtagccccgtatcactgaagggtggtcaacgttggc  
 gtgcgcgattctacctatgcttgcgggcttctgtatcacgaatcgtacctgcgtattgaggagcactacacggatactcgggcttcacagatca  
 cgtcttcggctctgatcatttactgggttttcgcttgcaccgcgcatccgcgacctaggcgataccaagctgttcgtgcccccaaggaaatc  
 gatta  
 tgacgcgattaagtaatgattagtaaaagaaaaactggatataaggccattcggacgactgggatgaaattctgaggctggccacctgatcaa  
 acaagggtaccgtgactgcctcgtgatgttgcgcaagctgggtatgtatcctcggcagaacggcttagccgttgccttcgcgaaatcgtcgc  
 cgaacgcacgctgttcatttggactggctacaaagtccgagctgcgccgtcgtgtgaatgcaggactgaacaaggcgaagcgcgcaatgcg  
 ctggccagggtgtcttcttaaccggctgggcgaaatccgagaccgtagcttgaacagcaacgctaccgtgccagcggcctcaacttgggtgac  
 tctgcaatagtgctgtggaacagggttacctggagcggctccgaaacgattacgcggacatagcaccgctgtcgtgatgaatcgtcgtcagta  
 cctgtcggcgtgggctgggagcacatcaacctaaactggtgattacctgtggcgagcaccgtcaaggttgggtgaggaagattccggccattac  
 gacgactgaaatcagcttaa

> *AvrPpiC2<sub>P10</sub>*

gggaactgaaccgcttatgaaaccactcatttcgcatcttttgaataggcgctgaaaatgacaatcgtgtctggacacatcggaaaaaccca  
 agcctaaccactgttcaagctgggtcttcggcttcggctcgagaatcaaatgcctgatcctgcacagttcagtgatggacgggtgaaaaagctccga  
 ccaattgtcgtcaattacattggcgagattcgtcaggtatattgcacgaataatcatggcatcagtcagcgtgcaatgtccttggcctttcattgag  
 ctggattaacatgattcatgccgggaaagatcatgttacgcctatgcatcggcagaagaatgaggttctgggttcttgaaggggtggtgcat  
 gctcgtactgttcataactctatcggactgagcacaatttctgatggagcaagctccgcaaacccggagatcaagtggcgcgatggctggca  
 cagaaagtattgaagctgctgagttgaaggggttaaagcttcaactgttctagaggacaagtcgaactcaggcctacccttcaattgcgtgt  
 aagcagtcagggcggcaggtgagcacagatgaagctgcgtaagctccttatgtgatgcaattgtagaaaaaagagaggggtaattggtgatata  
 cagccaagaaatgccacgcttgggctttctgtatcatcagatggcaaaagagcgaccttattgatccaatcctggagagttcatacactc  
 gaaagcgttggctgatactatcgaacatcatcggcagatgggctgccttaatcggcgttcaagtattcgttcaaaaatacactga

> *hopPsyA<sub>P10</sub>*

tggaaccgctcgcagcagaggctccactcattgaaaaacccccgttggatgagcaggtgatgagcaacctttctacaaaacctgcttggatgactt

ctccagatccctcagatgaaccgttggtatttgatgacacgggacgtgcaacatgatcatcgacaatacgttcgcgctgacactgcatgcatgacgatt  
 acgcgcgtgagcgcctgctgttgatcggcttgctgagccgcacaaggacatacctcagcagtgccctttggctggcgtctcaatccgctcctcaa  
 tgcaggcccagccctggcctggatgagaaaagcggcctgtatcacgcgtatcaaacatccctcagaaaaactcagcgtgccgactcaca  
 cgcgaaatggcaggtctgctggagtggatgaggggctggcgcgaaagcaagcaatagacgccttaagactctcgtgacacttttaaatgagaa  
 ataacccatgaacccatcagtcacgcttccagtggtcaagagctcagacgatccaacgttgatattccggcgtcacaagccaatggccaact  
 ggaggtcgacggcaagaggtacgagattcgtgcagccgatgacggaacaatttcggtccttcgaccggagcaacaatccaagcgaaaaagttt  
 ttcaagggcgttcccagttgataggtggcagcagccagcgcgcgagattgccaggcgtcaacgagaaggtcgcacgagcgcactgctc  
 ttgaccagagcgcctatgacgggaggacgcttgacacccttgagcggggcgaagcagctcagccacaacagccatcaaacccactgcca  
 acaggtcgcgaaagtacttttaacagcttctcagtgaggcacaacagcagagcgcgatgcgaaaccgtctcgaatggatattacaagatca  
 taaacaagatgcacctactcacacccatgagcgcagcagcaagaaggtctcgcacacgctaaaggcattgaatggcaaaaacggcatt  
 gaggtcgcactcaggaccagcagcgtcagaaataaaaaagaccgcaacctggacaagtacatcgagagagcccggatgcaaaagaggtt  
 tttctatcgaattatcccaaacatgagcggcagagaagataagaatcaagggcgattgaccattggcgtgcaacccaatgcaacacagttgac  
 ccgcgcatgcaacccctgataggggaaggaagtgcaatcacgcatggcaagtaatagccccgctgccacggccaatgaccgattcgg  
 cagttttgtatataacgggtgatgttcaagggcagaaaagctgggcgagaaactgaaacagatgagcggcattcctctggatgctgctgagc  
 acaccccttgagcatgcaatccctgagtaaaggtctgtctatgcagaaagcctctgggcgacaccagagccatgggatgctcgcgagcggg  
 agtgatcagcgccttgaggatggacgggatgccatttctggccagattgaagctatcactgtctgccaatggctatgaccggacaacccggc  
 ccttcaaacacgaaatga

> Pectin lyase-related

cggaactcttccctgcgctttcactcaggggactagccgtacctctatccgggacaccattgttcattcccacaggcggggaactcagccatg  
 aatacgatecaacagaaacatctacccgctccgggatttctcgcgaggtgcccctgtacaaactgatcagctccagccgcaaggccaggccat  
 caggccggggcacaatagcaacctgatcactcggactgatacagcaggccaatggtccgactcatcgctgaacacatcagctccagaatt  
 cagccgactgacaccagcacatcctcaaacaggctgggggtaaatggcgatcagttactgaacaaactgtggaagcgcctgtaataatcctcaa  
 caacctgctctctgctggaagcaatcaacaccagggtcttcgctgcacagaccagcgtgaacagacgcccagctccactcaatcgcac  
 gttcgcctctcctcgtcgtctcactctcgcctgcacatcctcccagcttcacctcagtgccctcaacgctcaggggcaacgcagaaaaaccgtt  
 gtggtgcagagcgcacatccggcggaaaaaccggatcgtcgcagagaacctcagagccaacgctctgacgcccacaacaccaccgca  
 ggctgctgagcgaacagcattacccggacaaggcaccggccaacccgaagcggtaagccggcagtggtcaacgaccgggtgctgccg  
 aaaacctgatccctgccgcccgaagcctgacagcaggtgaccgcccgaacacgcgacgcccgtgcccgtggccaggggcgtgaca  
 tctccggcatgatcggtttgccaaggaagccaataaccaccgggggcaacaacggcgaagtgtcaccgtgaacacggttggcactcaaga  
 agtacatggaggacgacaaagcccaccgtcaagctgggggccaacctgctcgcgacagtaaggtgcgataaatttcggggccaacaaa  
 cctgctgggaccgataaaggcaacacctgcacaactctatctggccagcggcaagaccgccagcaacgacatttccagaatctgaactc  
 aaccacgacgccgttaccgtgaaaacggcgacatgcagatgttcatcagcagcggcagaaaactggtatcgaccacataccgctaccggaa  
 ccaaggatcagaaccccaaggtctggataaactgctctacgtggggcgaagcagataacgacgctgaccaatcgaaattccagaacaa  
 cgagtatggcgtgattctcggcagccggcagctcggcagccgcaaaagccgagtacaagggtaccacggatgacaatcgccaacaacgt  
 gttcagcaacctgatgctcgcgggcccggctgttctcagggccaatttgactgagttacaactcagcagcaaatccacctcggttcactg  
 cgaccgggaacgctaccatcctgctcagggcaactattcagcaacgggtcgcgatgtttccaacaaggcaagtaatagcggcgtgctggatgac  
 tacggcgtatgacactcaagacatcggcagtaacgacgttccactcagaaatcggcggtaccgctgacaccgagctacaaccgggacgt  
 gaaaacagccgaagcagccagagcctatgacctggccaatgcgggtgcacaggtcgtgaaataa

> *iaaL<sub>P10</sub>*

cggaactgcaacgttgttccggtcactcagtgagcgtcaatagtcgggggtgctgactgccgatgctcatctgaaaatcggcagtgccgttcaa  
 cgggaagagaagggtcaatggcggttaccaaaagcagcttaccaggggctcgggttggcgcagttgtgttcatgaccagcaccagtgccgac  
 cagcctgtgtgatcttctgatgaagtgtgaccgtggtttatctcgcgatgctgcgcgacgacagtttctggccgcttcgctgggtggccaag  
 acctgatgttttcatatctcagatgattctggcatcggcgtggcagctcttcaaccgtgctgagagccttgggcagtgccgtgcccagcagc  
 caggcggctcggcagcagcggctgctgctggcagcattgcccactgctgtgctgctgctgagctgatattctggattcagccatacaaatgc  
 tggcggcggcagggcagtagttaccggcggcgcgagtaccttgggtaaccttccggcctcgggtgctggttggcgtcagcaactgtgctg  
 cagatactgcgagtgacgggttcggcaaacaggcagtggtgaccctgctgactgcgactgctgcccgtcgaatcggcagccgctgcttcat  
 cgtgttcgatctgggctggcgggtgctgggggctgcctacctgatctgagcctggtatcggcgtgctgggattttattacgccaccgtcggc  
 cgctgacctgctgggtcagcctgacgcacctgctcagcgcacatcagcattatcggccgaactgccgtgcccgggtgatcgaaacctggcga  
 caccgggtgggatggctacgtaatggctgcgatggcgcattcgggtgcacaggcgtggcggcgtatgggggtgatcgacagggtcattcagg  
 tagcgttttgcgtggtgttgccttggccggcgcgctgattccgatactgggacaaaacctcggcgaatgaacaccggcgtctcgaagccg

taaaaaccacgtacgggttctgatcgggtacggggcaaccacctcgtgttctgctgattctgctggctgagccgttggccagactgtccatgttcc  
 cggcgaaggcctggtgtttctccgcgttctgctgatggggcggcttctctggacgctgatcgggtccagttcattgccacgtctatctttctcag  
 cgcaggtcaccgatgtacgtgacgttgttggctggctgcggggccagcctgggaacgggtccgttctgctggtatggcgcacaggcattcggc  
 agtctcgggtctgatcctcgggcaactgctgggcaaccatagtgccctttgtgctgctgggtggcgcacatgctcatgaaaaagcggataggc  
 aacaagctcgaactaacagggaaccgatcctcggcatcaggtaactcatagcccacgcttctccgcccctcgtgctgacgggtgggcaggtcg  
 tacagataatcaaaaaatggactatagaggactctcatgactgcctacgatgtagaaaaggatggagcagaattccaatactgccgctaaaact  
 caccagaacaacgattttgaaggttcacctaccaggactcagaaccacgtaccgatcatggacaaggaaggcttcgggcacaaccgaac  
 gctgccttgagcgcacgagcgaactgcctgatcggcttaccagtggcaccagcggcaacctcaaacgctgttattactactacgactgtgaag  
 tcgatgaagacagttcccgtccaacgttccgcagcaatggtttcattcaaccgggtgatcgtcgcgcaacctgttaccatcaacctgtttctg  
 cctgaacaacatcaccaccatgatggccgtaactgcggtgcgatgtggttccgtaggcgatataccctgctaccaagagtcacttcgag  
 gcgctcaactcgataagctcaactgactgctggcgtaccctcgaccatcctgcagttcatcgatgccatgcagcagcaggtgtgacatcgat  
 atcgaagggtcgtctcaatggcgaggcctgaaaaccttcagaagaaaatcatcagggaagccttggcgaacaggtctccatcgtcggcgt  
 atatggcagttccgaggcggcattctgggttccacaacagcccttccacaccgaatacagtttctccgacaatacttcatcgagaagaa  
 ggcgacgacatcctcatcactcgttaccgcgagaactcaccgctgctccgggtatcgcctgggagacaccgcaacgcttctgctgaaagg  
 cgacaagctctattgactgacatccagcgggaggacatgagcttcaacttcatgggcaacctcattggtctgggcatcattcaacaagcgatcaa  
 cagacactggccgcacgctgaaatccaggtcacctgcatgactgatgcgcgcaaaagactggtgaccgtttctgtcaggcctcggaggt  
 caacgaagatgaacgcgccagaatcgaaacgcccacgcccgatattccggacatcaacgaggcctatcagaagaccagggcagcgtgctggt  
 tgtgcgcaaggatgccagagactacgccgtctcggagcaggcaaaatgctctacatcattgaccgcaggaattga

> CEL orf1-related

tggaaacctcacgcttagtgatgaccacgcatagccctgcaacatgaacaaatggcccagcacaataggatagtagattatgcaataaggaatgcc  
 cacacttctcattgataaggctggcgcagaatacctcgacacctcccaagttagaagcaccacatagccacttctactgcacaagcaccgtatt  
 ggaatctttacaggagagtaaaagctatgcttccagggttataactacatcgtcgttagtcattatgctctcatgtgcatcagccgctccagcttct  
 tctccgcagacatgactcccagcgtgctgaacgagagcagctcggagcggatttccagcaatggctggctacttccgcagcaatgcaactacta  
 agggcatcgacacagccacactcgtctgtttccaaacatcagcttaccgactgtgcaccagttggataggcgaaccagagttcacga  
 cggccatctgggattattgtgtaacgtctgactccgaagaatccagcaagggcaggagcttctcaaaaagagccagttctgaacgaggtag  
 agcgtcactacgggtggtgagtgcaagattatcgcggccatctggtgattgaaagcggctacggtaaggatattgtagtcgcgatgtgattcgtc  
 ctggccacgcttcttacaaggcggcggatggattacgggctacacagttgatggccgcccttcatatcgtcgaacaaagacatcggcc  
 gtgcgcaattgattggctcgtgggctggcgcgatgggcagacgcaattcatcccgcacactatctcactatgacgttatttaccacgaca  
 atcggcgcgacttggagttccgggctgatgcgctggcctcactgcctcttatttacaacgcagcgttggaaactcgcgctcttggggac  
 aggaggtgacgttcccagaaattcagttacgctcaggtgacatgctgatcaagaagcccgttggcgaatggcaacggctcggggtgatggg  
 aacgaagcaagcattccgggagctcgcacaggagcaagcatcgtcctgctgccgcaggttatcggggccagcatttatgctcctaagt  
 aatttccgtagcactcctgcctataaactccactgcctatgcgtaacgatcgggctactagccgacagttatgctggcgggaccggcgtgtctc  
 acccgtggcaactgataatcctccttgggcagcattgcgcagtaaccgatttgcagaactgctgactgtaagggtactcctgggtgctg  
 ctgacggtgttatagggcagatgaccgggcccactccgggcttaccagaaggatcagcatttgcaccggcaggttacgccagcactgtact  
 actggagagcctgcgccgatag

> hrpA-related

aggaaactcatcaccgcgaatcgcactcagcagcgataaaggagattactcaatgaacattacgccgctcacgtcagccgcgggcaagggtc  
 cgtccgcacaaggcacagacaaaatttccattccaactccacgcgcgatgatcaatgccgcttcaatcaagtgttgaataaggtcgtatgcgcca  
 tcagtaccacatccgcaccagcagcagaaaaggaaactgttcgagctcgcctcctgggagcaacatgttgggtctccggcttctcagcgc  
 gcccctcgcagcctcaacctgtgtggcgttggaggtgaccccaatcagcactgaacctgtcagggtctatatgaggacagcggcggcaag  
 ctactccctgggaccgacgccaacgcggtcacgacgacgtcgaatccatcagagcctgatcgcagagcgatacggctctcatcattac  
 ctggcggcctcccagggctcgtgctgagttgctgggcattgcgctggatcacgcgcaacgccacagtcctcgcgcggacaggtctgcaa  
 gggacgacctggccgagaggaggaacggggcaaggttcaatccaagcaacaaagccgacagaggctgaagcctacggtgatcatcag  
 acaccaatcctgatttgcacaggcaaaaagagacagctcaacgcgttctgaaagcatcaacagcatgcgagagcagcaaatggaatgcaa  
 cgcgccgaagggtctcagagccaaagaagcgttgaagctcgggaagccgcgcgcaagcagcttctgacgtgctcagggcatccaggc  
 tggcctgaaagactccaccgacaagaagatcagcggcactgaaaagaacgccacgggcatcaactaccagtga

> *cfal*<sub>P10</sub>

gtgaacgagatcgaacaaacctcgtcgcacattctggtcgtgatgacctgttcatcagcacccccgcggatcgcacctaacgcaacctacg

caacgccctggggtgattcactcgggtcagcgaattgcgggcccagtgcaatacgccttcggcgtaaaatcaggacgaggacttcaat  
ccgaagcacttcgactcggccacacgctggcccagttgctgaccgccctgcaggccaagtga

> *cfab<sub>P10</sub>*

atgtgcagagccaggacccccgatctcaatgaacaagcgtacggcaacaacttgccgggatcctgttgcgcgctgagcaaccggatcgactgg  
acgtcaccttcgcgcagcacgccatctggcaaaaaggccgccgtaategtttccaatatttctgcaggagtctgcccgtgaccaccttcaccgtgc  
ccctgattctgtcggatgcaagccccacggcactcggcgtaccgcgcaacgtctgcgcgccgagcagagacgcgctccttcgccgaatggc  
aagtattctgccgacagcaactgacacgcgacatgccgaataccgcgcggccatcttagccaccgatcaaggcactactcaaagggtgga  
tatgctggcccgccggcggagcctcgcgccatctggtgctggggccgcgccgaccagttgcgacagccggtactggtgtttccaggccaaggacc  
gctatggcccgggatgactaccggactgagcgcgacctgccgagctaccagcagccctgcaccgccatggcgatgcatagaggcgcgcat  
tggtggaatccagcagggccctcggcagggcgagggaatcagcgcctcctgcgaatccaaccgctgaattcgcgctggcctgtagctt  
ggcagaaacctggcggccttcgggacgagcccgtgccgtgacggcactcctggcgaggccgccgcccccacgctggcggctatc  
tgacgagggccagcggcgcgctcacagtctctggggcgagacgctaccgccatcgaaggccaggggcgaatgctgctggtagccgc  
agcgtcggacacatcaagccctgctggacgaccaagaagcctcagcgtcgcggccatcaacgcgccgcgagtgtagcttgagcggca  
ccctgatggccctcgtgctttgagcgcgactaccgacgctggcttctggccctggcgcgtacctgggtgctcaggtggcgggctatggcc  
gcaggtggagcagctacgcgacgccgtaacgtcgcgcgcccccggcaaaagtcagggacgacaggttccctactatctcctcggcagcggcg  
acggcaaacggcgagcatctggatgctggactattggtccgcgtactccgcgaaccgtgcgctccaggatagcctgcaggcgttgattgcc  
gatgggcaccgctgttcatagaagtgagcccgcacccggtcctacctcgttatcgacgaagccctacgtggcgtggtgctgcgacgggg  
ccgtggctaccctagaccagcgaaggatgatgtaaaagcctgctgcaggccatggcccacccctcgtgcacggcgccccgggtgactggt  
cgcaggtgatcagcgggtgctgcccgaagggtcgtatgacgcagctggcgccaccgcccaacggcaggtgacgataccctcggcgc  
ggcgaacctcggcaactcggtagcctgaacagtctcggctgctcgaagctgctggcgaggagatgaaacgctgacggccagccattt  
ggcagcagaccaggcatttcgactcggcctcaccctcgtgcatggtcgaatggccaggccgtgctggccgcggctggcgtcagcc  
tgccggtgactctggtatacaccatctaccctcgcgccgtcgtacctatctgcgcggcgtccttgggctgacgtaccgagccagcggcag  
ggcgaccctcgtgacggcgcgcaccatgacgagccatcggccatcctggcatgagctgctgttatccgggtggcgccaacagccggaa  
gcgctctgagcgtgttgatgcaagagcgggacgcgatcagcagtagtaccgaccgcgggtgggacaccaccaagctctacgattccgag  
cccggacgggtcggcaagatataccaccgaccagtggtttctgcatgatgcctcggccttcgatccagccttctcgggtatatacggcgcgtag  
ccctcatttggaaacctcagcagcgcctgttctggaggttctcgggagggccctagagcgtgctggaatagaccggcctcgtgcacggctcc  
ctgaccggggtctacgccggcatcaggggacggagtagtaccagatccagcacgcctcggaggacgtgaccggctatggctacatggg  
cacggccacctcgtagccgcgggcccgggtgctcactgcttagcctgcagggaccggcgctggcgatgataccgcctgttcgctcctgtt  
gtggccatccataccgctcgaagcgtcgtgcaaacgactgccagttggccttggccggcggggtcagggctatgccgacccccggggtg  
ctgatcactttccagcagcgggtctgccccggacggccgtcgaaggccttctcggcgtcggccgatggcgttggcctgggccaaggc  
gtggcgtgctggtgctgaacgcctcctccaagcgaagccaaggggcgttgcctcggcgtcaccgcggcagcggcgtcaaccaggac  
ggcgctccaacggcctgaccgcgcccaatggcaccgcgaacaacaggtcattcggccacccctagccaatgcgggtcgtgaccccagga  
cgtggatgccgtcgtatcccacggcagggcaccgctcggcgtaccatcgaagccaatgcctcgtggccacctatggccagcggcccgg  
cggagcggccgtgctgctgggctcgtcaagtcgaacaccggccataccaggccgccggcggggtcggcagcctgatgaagatggtgatg  
gcctcgcacagggcaccctgccccgagcctgcacataccgcgccctcaccagggtgattggtcagccggtgccatcgactgctcagc  
gaacggcgcccttggccaaccgtagccgaccggccgcgccgcccgggatttctcttgggggtctcggcaccatgcgcacctgattgctg  
aagaatacgtcggcccgcggtacaagcgcctgccaggtgccgagaccaggctcctgttggccgctggcagccaagagcaccgaagc  
cctgcgcgatgttggcgcacgcctgcacggccatgtgctcagcaagcgcacctggcgccggacgatcggctacacctaggcatctcacg  
cagcggcttccccttcggcgcctctgcgcggcaccctcgcgcgaggaactctggaagccttgcagcgtagcagcgggtacggaccatccg  
tgctgctccagggcacggcgaggtccggcgcaagcgggtcttctcttcccggctcagggtcccagtgggccggcatgggtatggag  
ctgtacggccttcggcgtctatcgcaaacatcgaccagatcgagaccgcgctgcagccctatgctgactggtcgtgctgcgggtgctgcg  
tgccgaggaaggtgcaccttcgctgagcgtatcagctggtccagcccgcctgttcgcgggtgatggtggccatcggccgcttggcagtcgc  
tggtgctcaccggcagcgggtgattggtcactcgcaggcgcagatcggcgccctatatacggcgggcccctgaagctggagatgctggtc  
aagatcctggccatccgctcgaactgatgctggcccaggccggcaccggcgccatggctaccgtcgtcctcgggagcagcagggccgca  
actggccgcgcgggtggacgctcgtgacgctggcgttcaacagctctagcagcaggtgatcctggcgccaccaatgccatcgcgcg  
gctcctggaaacctgcaagcagaacgcatcgtagccaggcgcgctcgcggctgacgtggcggggactccccacagatcgaagctcgtc  
cccagttgctggcgcgcttcggcactgcgacccaggcgacgcagatcccccttctacagcaccgtcggcgacacaatcctgcccgtcct  
ggatggccggcagctggcgcgggctattggtgcacaacctctgctgccaagtgcgcttcggcagacggctccaggcgtgagcagtgacg  
gcgacgtcaccttcaatgagtcacctcccggtgctcttgcaccactggaagaacgattggcgaccagaccagcagcctcgggtcgtg

caacgcaacaagcctgcggctgattgccttggcagccctctcgcagctctaccttgagggtcaccggtgagctggcgggctgtatccca  
gggacgcatcgtcgaactgccacatccgttcgatcacaagccgttctggctaccggacaaggaccgaccgatgaccgggtcgggccag  
cgagccaccagcaccactgctgagcgcggccgtggatctaccgaggggtggcatgctgctgaccggcaccctcggactcggcggccatcc  
gtggctggcggatcacgctgcggccggcgtggtactgctcccgggaccgctacctggacatgctgctgctcggcggccagaccgactg  
caccagttgctggagctgacgctacagggacccttggctgctggagcagcagggggcagatgacctgttgctcacggtagccgagcgggaagc  
cgaaggcctgcgccaggccagcctgcatgcgcgacgccatggcagatgccaccgccggttggacctgcacgccagtgcgcagctggtgccg  
atgccccccagacacttattccgctcagaccggcttggccaccgacggccgccatcccccttgacagcggcgctctatcaacggctcagcg  
aggccggctacgagtacggcctggcctccgggggctaaccggccgctggcaggacggcgaacggactacgctgaggtaacactaccga  
gacctgccagcggcaccacgtctgacccccgctgctggatgcggccctgcatcccttggactggctgacgaagaagccggcggc  
cattacggctgcccctcgccttctcagggctcagcgtgaccgggagcggccgcccagctccgcgcatgctgacgagcactcagccgaga  
cctattcggctcagcggcctatgacgagacgggtaacgccctgctgcacatgccgcgctccagctgcggccggcctcccgtgacacctgcgaga  
tctggcccgtgtccagcccgccatgacctgctgcggctcactggagtcagttgtcggcacgaccggcgtgagcggagccgtgacgcgctg  
ggtacggatagggactgccgagccagggtcagcagcggccgacctatccctctctacggctctcggccaagcgttgagtcagcaccac  
accagccgatgctctggttggcccttggccgaggtgcagggcggcgaacagcggcgtggcgacccggcagctatgctgaggtgatgcc  
aactgcaggtctggttagccgaagagcgtctggccgataccggctgctgtagtgacctgcaagccaacgccaggtcggcggtgaagcc  
gtcgatccggctcatgctgcccctgggggttggctgcacagcggcagaacgagaatccggggcgcttgtgctgctggacaccgaggggccct  
tggccgatccggcaccattgcaggccgtgctgccagcagcagcggcagttggccctgcggcggccagctgctggttccgaccttacc  
gcagcggcccgaacagcgttctacccccgcttggcggtggcgctggcggctagagatcacgctgagggcaatctcagcactggcg  
ttgcaaccggaaccaggccgatgctccattgaaaacggccagatacgttggcagtgccggccggggtaacttctacagctggtct  
gtccctagggctgattccggcgaacacaaaactggggagcgaagccgcaggtatcgcaccgaagtcggcagggcgtcaccgacctggg  
cccggcgatcgtgttctggaatgagcgaaggcgccttggcccgtgctggtcggcagcagcggcgcaaacgcccggcactg  
gaccttccccaggccggcgcttcccggtagcttctgaccgectactacagcctgctccggctcggccaggtgcggccgggtgacaaggtg  
ctgatccagcggccgagcgggtgctggccagggcgaatccagttggcgaagcatctggcgccgaggtcttcggcaccgccaccggga  
caaatggccgatcctgaaggccttgggcatcggcaggatcctgccacttgcgggatctgagtttccggcggcgttccggcggcctggtg  
gcaagcggggatgagtggtgctcaactcctggccggcgagggcagcggcgtctccttggcctgctcggcggcggcggcggcggcggc  
actgggcaagaccgaggtacgcgagcccggcggtcgcgcttccagatccggcagccactatcattacagaccggaccaggtatcc  
acaggacaccggcgatgctcagcagttgctcggcttgcgacgggatactgacggccctgcccggcagcagccttgcactgcgcgat  
gctgtccagggcctgcgctggatgcaacagggggcggcacaccggcaaggtggtgctgacctgcccggcaccctggaccggcagcggc  
tactgatcaccggcggcaccggcaccctaggtagcctggcggcagccatctggtcaccgggcaagcccggcatctggtattggccagcc  
gcagtgggcccccaagcggcagcggccctggcgctgcggcaggagttagaggccggcgcccaggtccggctggcagcctgcgacctag  
ccgatcccagctcgtcgaacgcttgcctcaactcgtgctgccaagcaccgctgaccgccatcatcataccggcggtactagccgatgcc  
acctgcccacctaaggccccgaggagctggagcgggtctctgctcctaaggcggcagcggcgttggatgctgcatgagcggaccggcagctg  
gatctggcggcgctcgtccttactctccagcggcggcagcactgggcagctcccggccaggccaactatgccggcggcaaccgcttctcgtatg  
tctggcagcagcggcagcggcagcggc  
acggcggcgggataatgctcggatcggccgacgggcttgcggccatccccggagatggtcagcggctgctcagacggcaatcggcg  
ggcccaggcatttctcgcggcaccgctcaatccgagacgctacgcaagaatggcaggcgggtacctgacaccgctgttcgagcgtctg  
ggggggggcagccccggcggcggggcagcaggggtccggcaaggtgcaggacctgcggcagctactggctggacttgcctcaagca  
cgaaccaagcagttgcagaccgctatcgcgaccaggctggcgtatcctgggcctggacgatccgggccaaggtgctaccggagggcagctt  
aaggagagtggtcagctgctgagctgcgcaaccgggtgctaccggcggggttaaggttagcggcagcccttaccctac  
gaccagccgacaccggcggccttggcggcctacctgaacgacgcttgtccccgacggcggcggcggcggcggcggcggcggcggcggc  
acgagcctaaggctggggcgtgctcggcagcctgctgctgagcggccttgcgggaagccgatctactccccctgctgagcttcccagca  
tcccttgaaggcggcggcccttggcggcagcctcgcgacggcggcggcggcggcggcggcggcggcggcggcggcggcggcggcggcggc

> *syrE<sub>P10</sub>*

tggaccgataacaaattttggccacatacatgtttaaaggacattctgatgaagctgttctaggttggcagagtggttgcctccacagcttaggca  
caccaaggacgagatgatactcccggcggcggatgatgctggaacgtaagcaagctccataagagcgttctggtaagcctcaatgctcggaa  
atgcgaatggggacgtatggcagttctgctgacggccgtgtgctcagcaagcatgagtaagcagggcgggataagcggtaatcggggttacac  
cgccgtggacaagtgcaggaatcaggtatgcaaatgctggccgatcggtacgtccgagccgctaaaagcgtggtgagacaagtggga  
tctgtaggtgctcgaagctcagcattcttctgctgatcaagtccagtttgcctacacaaagtgcggctccggcggctgaaaccac  
cgggcaacaggccgctatttaccagctcaatatttggatggtgcgaaagagctgcttaggatgggaaacctgcacctaatacgaacacgct

ttgggaaggtgctaatacgaacaaataatgagttaaacacggggaaagtctgattatctgaaagtaaggaagtttttaaatcttaggtcaaaagctg  
 aacaaaatctgatggctacttcagaacctcctaggtctgacaccagttcatctcgaaaaattgtgctgtaactaccatctctgatgaaactgg  
 ccagcactacaggaattcggtagggccgcgaacatcatcattcagctgccggaagaatataaaatcatggatgttacgcatgaagccatcaaat  
 caaaaagcatcgaaaaactcaattctcgtatgaactgtcctctgtacagcaggggtatctggctcggtcagatagcggattcgaacataccactgta  
 caacattggcatgagactggagatcaatggtgatctcgatattccgatgttcgagaaggctatcaatctggttccaagcataacgatgactacgg  
 ctgacctgttccatgagggcgatatagccagcgaggggtgctgccatctgctgatacagactcgcactcgtcgattttcagactacgttgacag  
 tctcgagc gagcgtggaatacctcaacaatcattttcccaccgttcaatcccttggaaaggcattctttgggaggtgcagctcgtacggtgcagt  
 gcatccatcattactggctggggcgggtccatcattggtcatggatggcgcaggggtaacgctgttctgccatgcagtgagaaaagcctacaat  
 aatttggggcggcgcagcagctcgggaagccctctacagcagcttctgatcaagacaaggcctatctgagttcgtcgcgcctggag  
 cgcgacagggcgtttggcgcgaacgctatacaactcgcgccacctctgctcgagtgtccggcgatcatgccgtgggttcaatgtgcaaga  
 ggggtcatattcgtcgcagataaagcgtgacctgttcaatgccctggcgtccgttccaccgagcatgacctttctcctgctcgcgatattctttgccg  
 ccgtaggcgcctattttcacgtgttggtgatgctgaagaggtcatatcggcatgcccctgcataaccgcagcagggcctgtcagaaaaagacga  
 tcggtatgtttctccgttattccgatcggcgtacgggtcaccctaatcgtccctgctcgaattgatgggcaatgtggccgccgaattgcgacgc  
 tctaccgccatgagcattttcaatcgcggaaactgaatcgcgccctcaatattggcattccaggcgaagcagatcttcgatatacgccttccatt  
 cgaaaaattgacggcactttatctttggcggctccccctgcgcagcggatcagagcggcttcgatcagacgccactctcaatcgtatc  
 tgcgattactattcagacgatgacattgtcgttactttaactcaatctgacctgtttggccaagacgaaattgaacggattcgggaccgcattacg  
 ctgctcctgaagtgggtccgctcatgactcaacaccgatttagccagcttgcgctgatgggcgaaaccgagcggcggcaagtctcgtcaggttc  
 aacgcaacacatcaggcattgcagcaggatctattggtccatcagctttcgaacagcaagcgcagcagcagcctcaagcgttgcactggtgtg  
 cggcgacgagtggtgacttacgcggacctcaacagacgcagcagccaggtggctcatgtctgctgactgggcattgttccgacaccgc  
 gtggcgatctgttggaaagcagtggtggagatggtggtgggcttctgctggggatcctgaaggctggcgggtgcatatgtccgctggaccctgggt  
 atccgctggagcgttgcgctacatgctggaggacagcgcgccgtgctgggtgctggtgcagcccgaaccgggagctgctgggtgcgctg  
 gcgatgccggtgctggatctgcaaagcgcgaactgggcggtaaggccgagcttgatcgcgtgctgccgacagtcacgccacagcactggct  
 tatgtgatctatactcgggttcgaccggccaaccaaggcgtgatattgagcatcgaatctcgttaacctggtggcttggcactgcgatgat  
 tcgatctgaccatcaaatcgcgttccgagcgtggcgggagctggttccgatgctgcgctgggaaatattggccagcttctgtgtgggagcca  
 gcctgtcgtgctgctggacaagcgttggcaacgatgtggatgactgctgtgtggtggcgtcggcaagatctggatgtgacttctcctgcta  
 cggcggttgccgagatggcattcaccgaagagatcgaaccggccacgctgcaaacgttgcgtgattggcggagaccggtgctcgtggttcccaat  
 ccggatagtcaggtcgcgctgatcaacaactatggtccgaccgagacaacgggttggcgcacatccggtctgatcgaacacagtcgggtatt  
 gcacataggccgtcctatagccaatacgcaggtttatctgttggatgccaccggccagccagctaccattggggtcagcggcgagatccatctc  
 gcggtgcgggggttggcgtggtctatctgaatctccggaactgacggcggagcgttctcgtcagggatccgttcagtgccgagccggcagcgc  
 ggatgtacaggagcggcgatctggggcgtgctggcggagcggtaatacgaatacttggggcgaacgacgatcaggtcaagatacagggct  
 tgcgtatcgaactgggcgagatcagacgcagctgaaacagatagcgaacatcagggaagcgggtggtggtgcccagagggacacgccggg  
 cgagaagcgtctgacggcgtattacacacagcaggaagcgaacagggcgattacggcgcagacattgcgtactgccttgcaggcgaggctgcc  
 tgaatacatggtgccggcagcgtatgtgaaattgtcggaaatggcgcgtgaccccgaatggcaagctggaccggcggcattgccgacgccggg  
 ggacgacgcttacccagtggtgactacgagggcggcggcagggcaagtcgaacgtgactggcgatctgccaagagctgctcgggtatcga  
 tcgggcagggcggccacgatcacttctcagctgggtggcaltcgttgcgcatgagactgatcctcctggccgacagcgttgaacgtaga  
 gttgcgattggccgagttattcgcacatccgcagctcagggcgttgcctgctggttggagcaggcacaagcaacgcgctgccgagattgcg  
 ccagctcagcagagatgccattgccgctgctggttctcagcaacggcagtggttctggccagatggaagggtccagcgttgccttaccacata  
 ccggcggggctgcgcatactcggcgcgctggatgagccccttgaacgatcgttgaaccggatagtgccgctcagaaactactgcgcaca  
 acgttgcagcagaccgcggaccagctcgtggtgctgcgcataatcccagggaaacagggctgcccttgcgaagtcagatcagcagcgc  
 atccgatggctcgcgtgagttggcacgactggtggacgaagaagccattagggcgttctgatctcagcagggaccgctgattcagggagcct  
 ggttctctgagcgtgagagcatgtgctgctgttaccatgcaccacatcgtatcggatgctggtcgtgatggcattttgacgcgcgagttggg  
 agcgtcttacgcgagcgttccaagatgaggcagccccgttggcggcgttgttgaatcagtacgcggactacgcgatgtgcaacgaagttggt  
 tgagcggcgaggtattgcacaagcaaaagcacttactggcagacggctctgctcgtatgcggcgattgctgatgttcccgtgaccgtgtacgt  
 cctgcgaacaggactatacgggtgctcggtagctgtggtgctggtatgcagcgtgagcaatgagctcaagcgttgcagtcggcggcagggc  
 accactctttcatgactactggcgggctgggcaacggattgagctgttgcagggcagggatgaggtggtaatcgggttcggcgggtggcgaac  
 cggatgagcgcggaggctcagggcctgatcgggtttttgccaacacctggcgttgcgggtatagatgtcagacgaccgacggtcagggcatt  
 gctgagtcgagtcaggcctgcagcgtggcggcgtatgaacaccaggatctgccgttcgagcaggtggtggagttgctcaagccgggtgcgag  
 ctgtcccatagcccgtgttccaggcgatgctgctggtggcagaacatgccgacggcggaaactcgcgatcagggcgtggagctgacgctgctg  
 gattcggtagtacgaccaccaagctacgatgtgctgctcacttggcggaggtagagggccggatcgtcgggtcgtggaatagcagcggcgc

tgttcacagagatacggcgcaaaagctacgtggcgtatctggaacgggtgctgcgtgcaatggcgcagaacgagcggcaggtagtcggagcga  
 tcaagctcttggcgaaaccgaacgccggcaagctactgtcaggtcaacgcaacacaccaggccttgcgacaggattattgctccatcagctttt  
 cgaacagcaagcgcagcagcagccgcaagcgttgcgctggtatgcccgcgacgaacgagtgacttacgccgatctcaacaacgcagtaatc  
 aggtgctcatgcttctgtcactgggcaattgttgcgacgaccgctggcgatctgtgtggaacgagtgaggatggtggtgggcttgcggg  
 ggatcctgaaggctggcgggtgcatatgtccgctggaccctgggtatccgctggagcgggtgtttacatgctggaggacagcgcggcggg  
 ggtgctggtgcagcccgaaccgggagctgctgggtgctgctgggtgctggcgatgccgggtgctggatctgcaaaagcgcgaactgggccc  
 ctgaagctgagcatgatcgcgtgttgcgacggtcacgccacagcacctggcttatgtgatctatacctcgggttcgaccggccagcccagggc  
 gtgatgattgagcattgcgccattgtgaaccgctgttatggggcgcagggaccactatcggctgagtcgcgaagaccgcttcttgcagaagacacc  
 gttcgggtttgacgtgctggtctgggagtttttctccttctgctcggcggcgaattggtgatcgcacgtccggcagccatcaggacccgagt  
 atctggccgagttgatcgcaggctgggagtgacgatattgcaattgtacccctcatgttgcagagcttctcaatcaggttggcccgtggcatgt  
 agcacattgcggcaggtgttctgtagcggcagggcgttgcctatagtttgcaaaagcacttcgagcaacgcttgcgcatgtgcaattgcataacc  
 tgtatggccctactgaagcgcgtgctgacgtcacctactggcactgctgcccagctgcatacggggatcgtgccgattggccggccgctcggc  
 aataccggctgtatctgttggaccgcatatgcaaccggctccgggtggcgtgcgcggcgagattfacatcgcgggtatacagctcgtcgcgg  
 ctattgaaatgctgatgcgctgaccgcgagcgattctgaaaagaccgttcaagtaacgaccgacggcgcggatgtataggagcggcgatctgg  
 ggcttggctggcagacggtatatacagatctgggacgcaacgacgatcaggtaaacctcctggttccgtatcagctggggcagattgaa  
 gcgcatctggctgggtgtgctggtgctggagaggctgtggtggttcccaggagggacacgccgggtgagaaacgcctgatcgttattacacga  
 cgagggaagcgaagagattattgcagtgacagcgtacgtcggccttgcaggcgagctcctgagtaacatggtgccggcgccgtatgtgaa  
 attgtcgggtgcccgctgacacctaaccggcaagctggatcggcggcgctgcccgcggcggagggtgatgcttattgtgagccgcggtacga  
 agcgcctcgcgggaaggtggagatggcgttgcgaaatctggcaggagctgcttgcgtaacgggtaggcggccacgatcttctcga  
 ctggggggcattcgtattggcgtcagctgatggggcggatgcgtaagcgggactgctggcggatgtacggatgctgttgcagccgac  
 tcttccggcgttggcaggttggtaacggctcatgaggtggaggtgcccgcaacggaatcgtgctgggtgcacacgaattaccccgtcgt  
 gttgccgctcgcagacctcagcaggacgccatcagcgaattgtgagtagtctgtccggcggttacggcgaacgtccaggatctacgcactg  
 gcgacctgcaggaaggggtgttccaccacctgctcgtcgtagagggtgaccctatttgcgaatacgcgttgcgctccaagcgaagac  
 cacctgaaggcttctgctgggacattcagggcgtgattgccaggcatgacatcttgagaacggcggtgctgtgggaggggctggacgagccg  
 gtccagatagctggcgtgaagcgcattggcgtggaagcattggaactgaagcggcgtgacggagacatcgaacgcaactcaggagcgc  
 ttcgatcccaggcattgccggctggattgacaaaagcccccttgatgaagatggttacgcctacgacgacgcaaatagtcgctgggtggcgatt  
 ctgctgttccaccatggtgctggaccacatggcgtggaagtgggtcaacatgaggtacaggggatctgctggggcagggcagcgcgactgc  
 cgacccggctacctatcgtaacatgttgcgcaggcgcgattgggagtaagccaagcggcccacgaagcgttctccaggaaatgctcggca  
 ggtgacggagccgacgctgccattcgtttgcacgatgtcagggtgacggcgggacataaggcaagccaggcaggcagtgcccgcagag  
 ctggcgggagggatccgctggcaagccaggagctgggtgtgagtgctgcccagctgcatctggcgtggggcgcagcttctgggacgcagc  
 tcgggcaggggaagaggtgtgttcgggtacgggtgttctggggcggatgaggggtggcgacgggtccgaccgctgttggggatgttcatcaata  
 ccttggcgggtgcttgaacgtgggtgagcaaaagcgaagtgggggggtgaaggccacgcatgcccgctgactgcgctgcttgggtcacgaaca  
 tgcgctgttccgctggcgcaacgctgcagcggcattgccccgtcgttgcgctgttgcagcgcgctgctgaattatcggcacagcggccagccg  
 gaaatacggatcaagcagaccgcccctggggcgaatcgggcttgggctggaatgagtggaactatccgttgcgcttgcgctggacg  
 atctggggcagggcttgcactgaccgttcaatccagcggcggggctgacccgcaaaagggtatgtgcttaccatggagacggcgtggagagct  
 ggtcgaagcgtggagcactatcccagctgttgcgcccgtcggatgtgctgccgcgagccgagcgtcagttgcttccaggagtgaatgcg  
 acggcctggattaccgcaagacacctgctccatcagttgtcgaacgcagtggaagacggcagaagcgttgcgctggtattcaggg  
 cgcgcaaatcacttatgcgcaactgaatgcgcgtgccaaccagttggcgcattatctgatcggcctgggcacggccggatgaccgggtggc  
 gatctgcgtggagcgcagcccggaaatggtggtgggcttctgggggtttaaagcggcgctgctatgtccgctggaccgacgtatccg  
 gagcagcgggtgcgctacatgctggaagacagcgcggcggcgggctactagtcagcgcgatgaccggggcttgcaggcaagtggcag  
 gccgtgctgacctggaagcgggggctgggagctgaggctgactatgatccagttggcgcgagcagcgaagccgatcctgacctatgtg  
 attatacgtcaggctcaagcggccgaccaaggcgtgttattgagcaaaagggttctgcaatctgatgactggtatctcagcagctgaa  
 ctggcgtccgatgatccgctactgcttctcctatagcttcgatctgacgcaaaaaacattctggggccgttgggtgggaaacgctgcat  
 ctggccagagaggctttattcccagctgctgctgaaagcagattcaacgcgagcgtattaccacatcaatcttccaccagtgcttcaacgcgc  
 tcatcaatgcaaacgattcaaggcaactagacagcattcgggggtgactggggcggagagcctgttcagttcggcagattggaatgctccc  
 agccgagggcggaaatcattaacagttatgggcccacggagtgcagcagctggtggcctggcatagactggttggagatcgcactgttaccg  
 tctcgggttctccgatcggcgtccgatcgcgaatacaggaattacctgttggatgtgcacggccagccagtcgccatcggggcagcggcga  
 gatttatacggcgggtgcgggggttcccgtggctatctcaatctccggaactgacggcggagcgttctcggatgaccgttccagtgctgagcc  
 ggctgctcggatgtacagaagcggcgatctggccgctggctggcggacggaatcagtagtacctggggcgaatgatgatcaggtcaagat



ccggggctttcgtgctgagctgggcgaaatcagctgcaactggcggtttccccggggcaggggaagcgggtgctggcacgcgagtatag  
ccccggagacaagcgctggtggcgtacctgacggcgcaggaaggtgccgtattgacagcagcgcagttgcccgcgagcaactgctcaagggt  
tgacggaaacacatgatcccagcgcctttgtgacgctggcgagttccccgctgacgccgaacggcaactggatgctgggcattgccggcgc  
ggaggacgacgcttatccagctgctgattacgagggcgcctgtaggtgaagtcgaacctgctggcggagatctggcagggcttctcgggtatc  
gatcgggcagggcgtcaagatcacttctcgaactgggcgggcattcgttactggccgtgcaactggttcacgcctgctcggcagttcggagtc  
gacgtggcactgcgagatgtttgccgagcctacattacaaggcttggcacggcaggtgacgaacgccaggctcacggcgcagccgccgtt  
acgccggtcgaccgcaatctgccattgccgttgcgtgggcgcagcagcgcttgggttctctgatcaactggaccgtcgggcgggagccgcct  
atcacatcgctgacgggctacgcttgcggcggccaattgaatcgcgacgcttgaagccacgctggaccgcatctggctcggccagaaatcct  
gcgacccattttgtctgcacaaggccagggcgatacagttgatcgaccagcggccaagggtttgccctggctaccacgacctgcgctctct  
gggcagcacggcgcagcagggcggtcgagcggctcgtcgcgaggagtcggttgcaccgttcgacttctgagtggtccgctgattcgtgg  
gcggttgtgcaactgctggagacagacacgctcgtggtgacgcagcaccatcgtttcggacggttggcgcagggcgttctgctgcagg  
aaatcgggtacgttataccgtcctcagccaggggctggccgatcctctgccggcactggccttcagtatgccactacgcggcgtcgcagcgg  
cagtggttgcagggcgaaccctgcaaacgcaggtcgaacttctggcgccagcactgagcggagctccggccctgctggagctgccaccga  
ccaccgccggccaccattgcgcagttacgcgggcggcggggtgagctgcccctggggccagcattaacggcagggctgcgacagttgggtc  
agcgtcatggtgagcgtgttcatgacattgctggcgggggtgctgagctctgttgcgggttcagcggggcaggatgacgtggtgatcggcaca  
ccggtggcaaatcgtccgctgtagcgaactggagtcgctgatcggcttctctgcaacacactggcgctgcgcatccggccggaagggagcctga  
gctggcggcgttctgtagcaggtcaagcggctatgctggcggcgatgcgcatcaggacctggcgttcgagcaggtggtggagcgtt  
cagccaccgcgcagcctggccatagcccgatcttcaggtcagctggcgctgaacaacaccccgggcggcggcgaactcagcctgccgga  
gctgagcctggagccgtgcaaacgccgcacagcagccagttcagctgctcgttcaactgctgagcgaagggtgggtgctcgggtctc  
tggatacgcgagcgtatcttcgagcgtgcagcgtatcggatggcggggcatttgcaggtgcttctggaaggatggtggcggatgacca  
gcagccggtcggaaaactaccgctgctgctcgcgcgaacgctggcaggtgctggagacgttcaacgatacggcggcggcctaccggcgg  
acaagctgcttcaactgttcgagagcgggtggcacaacatccggatgccctggcggtggtcgtatgaagccggaagcctgacctatggcga  
actgaatgtcgggcgaatcactggcacattatctgatcggcctgggtgctccagccggacgatcgggtggcgtatgtttcagcgcagctg  
aaatggtggtggccttctgggaatttgaaggcggcggtgctgtagtggcgtgaccctggatccggcagagcgggtgctgctatgctg  
gaagacagtgccgggtgggttctgctgtagggcgaaaccggatgttggcggagttggcggtgccgatcctgatctgcaagaaggcg  
actgggaggtgaggtgatcataatcccgtggtgccaccatcaagccgcagcactggcctatgtgatgtatacctcaggttccactggtaaac  
ccaaaggtgtggcaaccagcataacggcgtcgtaaaccggttgggtggcgcgagagtgaaataccagctggggccgacgattgtcttga  
gaagactccattcggctcgtatcggctgggagatcttctcctctgcttggcggagcagctggtcatggcccggccggagccatcaa  
gacctcactacgtgatggaagtgatcgcgcggcgaagcattagcatgctgactcgttccctcatgctgcagggccttctcaatcagacgccag  
cagggcggtgttcgacgctcaagcgagtaattgcagtggaactgcccgcatacttgaaltgcaaaagccagggcgcatttcccgaaagc  
gagttgataatcttatggaccaccgaagcagccattgacgtcactgcatggcattacgtggcagagcaggagatcggggtcgtccgatcggc  
cgtccgatagcgaatacacggattacctgttgatagcacggccagccagtgccatcgggatcagcggcagattatcggcggagtagg  
ggtcggccgcttattgaatcagccggaattgacggcggagcgttctggaggtaccgttcatgtagggccggcggcggatgtacagg  
agcgtgatctggggcgtggtcggcggacgcaatcagtagctggggcgtaacgacgatcaggtcaagctccggggctaccgtatcga  
ctggcgagatcagtcgagcttgcgcttctcggggcagggagcagtggtactggcggcgcgagcagctccggagacaaacgct  
ggtggcgtatctgacagcgcgatgaagggtccgtgttgcggcgcagcagttgcgcgagcaactgctgcaagggtggccgaatacatgattccg  
agtaccttgaacgctggagagttcccgtaacgccgaacggcaagctggatcgcgggcattgccggcggcgggaagcagcgttatgcca  
gtcgtggttacgagggcggcgttaggtgaaatcagcagcgtcggcagagatctggaaggcgttggggctggagcggatgggtcggcatg  
accatttttgaactggcgggcattcgttactggcgggtgcaactggttctcctacgtgagcgttctgaggtcgaagtggcattgggcgatctgt  
tctgcatccgacaatctgtgaacttccgctcttctttagtggttgaaagaagctcttcatccgaatctaaccaccattcgaagaggggactc  
aataccccttctcctcattcatgaaggtcaggggatattggttatgcccacagctggcgaagcaaatctctgatatcccgggtgatggtttc  
ggcgcagcggactgcaaatcggagaggagcactcaccactatcaggcaatggcctcacgctacattcagggtatccggcatatacagccggat  
ggggcgtatcgcgtcgggttggctcgggggggaacgatcgcctatgaaattgccatcagttgatagggggcgggtgctacagtagagttctc  
gggcttatcagaccaccagtgactataggcatttgaatgcgcaggggtgaaacgctcattccctatgagacgctgagatcgaagcctgt  
tgaggctttgtcccctgatgcacgtcacgggctgtcagccactggctgctcgggattcagggccttattggctatagcaagttcaaggt  
ctgctcccgaaggatagatgtagctcgcataaaagatacctggcactgatccacagatcggcttggccctaccgttaccgttccggcagcg  
taccgacacgctcacttattctcggcgaccggagaaagtcgcagtgatcagcattggttggggggggctatcccaaggagcaactgcaa  
atcatctccgtaggggaactcactctatttgaagaaccgacattcgtgctctgggacggcgatcctgaggtatgccaataaggggg  
cagccaaaaccagtttagtttag

> *avrPphF*<sub>P10</sub>

gggaacctgatgctgctcagtgaccactcataaccttaaatatgaggatagaggagatgcattatgaaaacgcatttgacctgctgtggaagg  
gctggctaaggactacaacatgccgccttgcctgacaagaacatcgcgatgaagtctattgctttgagttcaaagtggatgaacgtaaaagtat  
accaagacgaatttcgctgggtatattcaccgctgacgttgggacatttcaagatagcagatgacacattaaactacgcgctccagctgaacaac  
tttagccttagaaaaccttctgaccttcggaatgacgaaggagaaaaatgggtgattgcatacacgcaccccccttgattgaggtagacaacgtgc  
aatgcgcagatatttgaggagcttataggcgtggcaggtgaaatcagaaaaactaaaactcaaatag

> *hrpW*-related

gggaaccgagtcactcagtgaccactcagttgtgtttgtctttatttcgattatgcctctgctgcgccacggcaccattccaggaggtattgatccatc  
acttgagtgagtaactggctatgaccatgggtgttccactattcgtaacctaaactccctgccgatcgattttcgtcgttgagcgcgaaagagtggc  
gggcataacgggctgggcagcggagacaattcactatcgaccgagtagctgtgttgcgcaatcaagggcagacgcaggtcaatttcgtc  
cgcccaacagcagcggactcctcaaccagcgggtgtaacgctgcgtcaggcaatcggcgtccggcctggtcagcaaatcatgacctgctga  
aacaattgatgcagatgctgatgaaaaacaacaatgctccggtaaccctcagactgattcgtcaacgccaggcgtcggcagtggaacagcgtc  
gggagcggcggactggaagcagctcgcaggcagtgacgggtggcgacgaaacgtccgggtgctggaacggcgggttaggcgacgcgggca  
gcacccaacaacgagcgcggccgatggtgtgccctggacttactcacgggtagcgggtggcgtgatttcctcaacagcttgagcagtat  
cgagggacattatggacgccgcaaaagccaccggcgtgcccccagcgtgatcgccggcagatagggctgagtcgcgcggctcagttgaa  
tggggccaccacaatgtaacggcaaggccgatgcggcctgatgcaggtcaacgcagacacgttcaagtcattgcagcagcaaaaccgg  
ggttgctgggcaacgacgtcaacgattcgcacaccaacatcatggcgggcgcgctctacctgcgagaccagaacaaggagttcggcgacatgg  
gggcagcacttcgcgcatacaactccgggcccagcaaggtcaataaagccgacctcagcgcacacgggaggcgtgggcggcagcagctacc  
ggcggacgtactgaacttcgcaaatcatcagagtgggcagggcaatttaccgctga

> *avrPphDI*<sub>P10</sub>

tggaaccaagagcccttgcgaccacacattggatccgattactcaccgggacagctgatagcgtatgaatcctctacgatctattcaacacaa  
cattgcaactcccccaatcagtgggcgtcagccattagacgcgggtggccctcaggccagcaatcccatcctaaaggatttcaccttcaattg  
agccaaagcgtcaccaggtcctagaacgccttcagctaatgccgaacaccaacgccttgcatcactggtacgaacgctctgcaggatggcac  
atttcaatttcaatccagtaaccacacgcaagtaacctataaaagcgtcaatctgtctgccagctgacaccgataccgtgagaaccgaccttgatta  
ataacgagctgacgggtcagggccgattaaatgatcaatcgagtagacatcgtcagcgcacattgcatggctcttcgaaagccatccttcga  
cgtaccagcccccccggcgcacatggttcagcatcttctgtcttgagtgaacggaccatctaggtatgagtcgcgttctctacaagatgcagta  
gacagcagtagcctggaaactccgtactgagctcgcagaccattctcgtccgcatcacagccaaagcccgtcatalcgggtcgggtccgcag  
ggactctgtagccttgttccgataaccggtagtgacggccctgctatcgttgcgagccgaccaggcatttccaccacagccgcgagcat  
tggcggggtccagctggaaatcgggccacgtcgggatattgagaaagcacttgaggaaattcaaaggcgccttcacgggtggtgaaggcgaact  
gatgtccgggtccaactcgtcggagcgtgtagatgaggatgcaacgcagacatccatattccccttattgctcaaggccatcgagcggggggtg  
cggcatttggccaacgcataatcgccagaatagcgcgaaagcgttctcgcctcatgtgctcccaagatcacgtccaatgacgatgctctc  
cgagttcatcaaccagaactcaagggggacgacgatctcaggttcgcctgggcgcacaggaattgttgcattgagccaccaagaaggaattcc  
agctcggcggcttagccggcagcatcggggtcagcagcactcggctcggcatgggagcttggcgcctctgagctgtgaaaaatgccatctc  
ggcaaaaatttctaccgagccaatagccctgcaattggctggaatcgattcagtgctcctttgattatcagttccatggacacctgtgcactt  
gccatcatcaaggccatgaagggtgaggatggtccatgagcgatctacttccaaggcgttgaaggccgggtgctatttctcgggtggtgctatc  
cccaataatgtttgagatgcaggttcaaatccagagtcggcgatcttgcggcaaacctcagtgacaactgaagcggccatcttggcggccgct  
ccggtattccaccgaggtcaaggaaagtgaagagctgatgcgtgctggttattccagagcatgaaggacggcgtgatggctcattcaggcga  
gggggtggacacaaaaaacgattgagcggatgacgcgccatgctggtatcgcctccgggcgaaagcaccgctgcaagtccatggggc  
tggcatcgattgctgggatgattccactgattgccgaacaaggcaaccgggctgctgtcggaaacaggtactcgattttccggagcggcgtct  
tcaatccaatcgaagccatcgctctgaacgcgttggcgttggcggcggtgcaacgttcccgggctatttgattccgacaatgccaagcatgcac  
gcgtggtacaacctccttgcgcgggccagccagcacatggaagctggagaccgtgacatttccgcagaggagctacatcaaatgctggctcc  
ccggagcgagttcctgcgccatgtgggatctgcgattgtcaacggcatgaatgccagctttagggcaattcccgcctggttcggaagccttgata  
tggtaggctccattggccgaacgtattccgtatcaagacctggctgtgccgcacacgtcgcggcagccccgacctga

> *avrXv3*<sub>P10</sub>

tggaacctgaagagtttaagccactcagtagctttctttttgagctgcacgatgcgagatcaaaactgttcagcacctgtgatcaaacataccat  
tcgcacctgtgcccccactcgcacttgatgtagtgcgccatgaaatccaagatcacatcacaacgaaaagcaaaatagcgaacctatacatt  
agccatagaggcgtgtaacgaccacaccaagtttccggctatgccgctacgatcctaaatftaatcctacattaaagagagaaccgtcatgggg  
ctatgtatttcaaacactctggtagcagttacagctacagtgatagcgaccgctgcaagtgcctgcattgcctcacaacgccaggtctgtatcca  
gtcatcaaacagcatctcgagtgacatcgcacaggcagtggtggaacgtcctgcaacgttttctcattttcaacttgcgcgggtcgggtggaga

gtacacgcttagcatggtttctgcagcggcttatcaagcagaagacggcatcgcggtaatttaataaaagatcgtagcaatccatactcccattg  
gtccaggtatattctaaaaaaggttgattacgctccagatcgacagaactacgactgtaaaagtggctgattcaactgctctatccc  
aacagagggactcggcatttatacagcgtggtacgagtcagacaacatgcctgtcatcgacacaacatgagcgcattgctgctgcgtg  
tgcggcggaaaacgtggatgctggcacgggtgaacgtagggccggggcgaaaagttcgcgtattccatctactccctttcgcagcgaagacctg  
tgccagaagaagtttagcttctgtgcgcgattatctgcaacgacaaagaacaggggtaacaatgctgtagctatgcatggaggggaataca  
gaggggtgatttctcagtcagcactgctgagcattgaaaggcctgtttgctaataagggatcccgttgaatttgacgagacctgtgcaaacga  
acgtctgaaacatgcttggcgttatcttagatgacaactcagctcattcataaaacatctggtcgcaataa

> *avrPpiB11<sub>Pto</sub>*

gggaaccacatcatgggtaaaagccacgaagagctaagttgtagaagcaacgtctggaggcatacatgcacgcaaatccttaagctctttcaac  
agagctcaacatggcaatctgactaatgtagaggccagccaagttaaatggcaggaacctctccaccactaatatagacagtaaaacattgaa  
gaacatgttcgacacagactcagtgatttaggcagacctgatggtggatggttttcgagaagtcacttggcaccttgaaaaatftaaatcttgagca  
gtagccggaatccatgatgtactaaaattaacagatggcgtaaagaacattgtctctttggagctcgggaaggaggcttcgagttggcaatgcag  
ttcgtcatgatttatacagatcacaacatccggatgaaaactcggcgcacgatgccgaactcattatcttgatgcaatcagcctgcaatcaaaaa  
ttcaaaaactgaaaaactacaacatgtagatgtatttaaaatgcaaaaccgtttgggatgctgggtacaaaaacggaattgctgcacgcaaaaa  
aatggcattctcataacgccagagtggctgggtctgatttctgtaaacaggaattccagtggcttagcgaacaaaaacaaagacataaaatctg  
catttgtgatctttaaagatgtagacttaaaaagcaaaaatgacaagtatctcaatttgcagactccataaatcacgcgtcatgatggcaagcac  
acctcccgaatcgggattgaataatgtaaaaatcgaaaatagcgttgacctgaattcaagagggtattaactgacctgagtcatgggaactaata  
attcctagggcactaa

> *avrPpiB12<sub>Pto</sub>*

gggaaccacatcatgggtaaaagccacgaagagctaagttgtagaagcaacgtctggaggcatacatgcacgcaaatccttaagctctttcaac  
agagctcaacatggcaatctgactaatgtagaggccagccaagttaaatggcaggaacctctccaccactaatatagacagtaaaacattgaa  
gaacatgttcgacacagactcagtgatttaggcagacctgatggtggatggttttcgagaagtcacttggcaccttgaaaaatftaaatcttgagca  
gtagccggaatccatgatgtactaaaattaacagatggcgtaaagaacattgtctctttggagctcgggaaggaggcttcgagttggcaatgcag  
ttcgtcatgatttatacagatcacaacatccggatgaaaactcggcgcacgatgccgaactcattatcttgatgcaatcagcctgcaatcaaaaa  
ttcaaaaactgaaaaactacaacatgtagatgtatttaaaatgcaaaaccgtttgggatgctgggtacaaaaacggaattgctgcacgcaaaaa  
aatggcattctcataacgccagagtggctgggtctgatttctgtaaacaggaattccagtggcttagcgaacaaaaacaaagacataaaatctg  
catttgtgatctttaaagatgtagacttaaaaagcaaaaatgacaagtatctcaatttgcagactccataaatcacgcgtcatgatggcaagcac  
acctcccgaatcgggattgaataatgtaaaaatcgaaaatagcgttgacctgaattcaagagggtattaactgacctgagtcatgggaactaata  
atttctag

> *avrPphD2<sub>Pto</sub>*

cggaaaccacacaagcacttatgaccacgattagatccaatgcctttcgtcagccaattactcaaccgagatagttcatacagctatgaatccct  
gcaacctattcagcagcattacaattcccaaatgagtggtggtcagcaatagagggcggagggtctcagggccacaattcctattcccact  
gacaggtattcgtttcccaattgagccaaagcgtcacctagcttagatcacctttcaactcagcctaataaccgatccaacgcgttgcatcact  
ggtacgcaacgctgtgcaggacggtaagtccaactcaatccagtaacgacacgcaagtaacctataaaactcagctgtccgccagctaacgc  
cgacaccatggggccgcccacttaataaacgagctgacggttcaggcccgattaatgatcaacttgatgacatcgtcagcgtcatttg  
tatggcccttcggaagccatattcagatgcatccagtcctccctcggccaacgatctagcgtcctctggccttgagcgaacgtacgcatctaggta  
tgaatcgtgtcctttacgctacgcggtgccccctcgggaaaccgaagaccaatgtgttatggtgatcgacaaaatgcccccccccaaacacggc  
aaaatgtctttctccgtaccactaatgacttgagcaaaactgcctttgggaatggagacgggctggttgcgacctgaaattggctggttgaacg  
tatttctccgtcagcaggtgaagatccgcgcagcgttgaggcgggctcaccgtactagatctgcgcgaagaatctcatcgattgt  
caacggttgctatcacctacgtggcccgatggattgggccaacgccggcctatcccagttgacggagcggcacgtgaaagtccatgatta  
cagaactgaagcgcactaagctttaacgttgatgccaattatgtaaaaggtaaaaaagtaactcctcaaacgacagaactgaaaaattgaa  
gtccggagcagcggagaagtcgttacagagggcggcgcgacctatgccgcgtggccattaccgaccataacaggcctagtccggaagcagc  
cgacgagctagtagacatcagcactgctgcaggcaaatgagtcgtagtggcactgtaacggcggctggggccgtactaccacggct  
atgataatggtcagatgcttaagaacgctgtaaccattccgcaaaacctcaccgcgtatggccaagtaagctatgactacaacatgacg  
gatctaggcagcatttctgactcaagcggcattcctagaggacagactaaaatttctgagggcctttcagactatgcccgcaacaaccaagc  
ggattatcttaattggacacagtggcgcgcaaaaatagcgttagaatga

> *hopPtoA2*

tggaaaccgtaacggcccagcactacacagcttttgaatccagttaactggagttagcctgacgtttccgctgtttctggcgtgtttgatc  
aaacttctgtattgtttcacgaaacattcgtccggacaagcctgactcaggatacagctgctcaaaactccgtagaccgagatagaattccat

gcacatcaaccaatccgcccaacaaccgctggcgttgaatggagagttttggacagctccgacgctcccttgcctcagttctgtcggctc  
 gtcagcactacctcgtgccgcgatctacaagctattaccgattatctgaacatcacgtgttcgctgcgcacaggttttcggaataggctcaccgga  
 tgagcgtgatgccctcttgcacacaacgagcagatcgtgcgttggtagagacacgcgcccaaccgctgtactccgaaggggagacccccgc  
 aaccatgccgaaacattcgcgaaggcggaaaagtccaccggttggcgacgaccgcatcaagtgttttgagaacacgccatttggcgtgcct  
 cgggtcctcagfacatgcagcctgcgatcaacaagggcgattggctagcaacgccgctcaagccgctgaccccgtcatttccggagcgtgtcg  
 ggagccatggaccaggtggcaccaaaatgatggatcgtgcgaggggtgatctgattacctgagcacttccgggacaagtgcgatgcga  
 tgccgtatcggtagaagcgcactcgcctgccttggcgcagaggttgggacatggggattgacgtgcagacgttctcggcgtaaatgtgtg  
 cgtaccgtattggctccagcactagcgtccagaccgctggcgcaggggtgctgttattttggcgtatctacggcggtggcttggttcgaatgcag  
 gctttggcgaccgcatgctcagtgcaatcgcgcgatcaactgcgtggggggcattcgtacttggcatgaaagataaagagcccaaggccgc  
 gttgagtgaaagaaactgattggcttgatgcttacaaagcgaatcagtcggccagctactcaggtgcggcgctcaatcggggcaagcggatggcc  
 ggcttccactggacgtcgcgaccgacgggctcaaggcggtagaagtctggtgctggccaccagcctgacaaaaaatggcctggccctagc  
 cgggtggttacggcggttaagtaagtgcagaaaatggcgacgaaaaatatactgattcggcgaccaaggctcgggttagtcagctgagcaac  
 ctgggtgggttcgtaggcgttttcgaggctggaccaccgctggactggcactgaccctcgggttaagaaagccgagtcgtttatacaggataa  
 ggtgaaatcaccgcatctagaccacaagctatgttccgaccagaccgtcaactggcgaaaacagtcaggacatgagcggggagggcgt  
 ctccagcaccgggtccagcttacgcagtaactgtcaataaactgcgtatcgcctccgctccggaagctgatatcgaagaaggtgggatttccggctt  
 tctcgaagtgaaacaccgtttcagctcagggctttaa

> *hopPtoB2*

aggtaccaatcgtcctatcggcgccaccaaggcaaccggcagtttgcagcgcggcagggcggcggtgcctggcaaccctgctccctc  
 cccaaccttgcctcgtgcacctcgggctcggatcagctggcagtaacctttccctgcatgacgtccgcgtatcgtccggccatgc  
 agaagcgtgtcgtgtaacggcggcactatgctgagctgtccggtagaaccttcaagtccattacgacacacatctgcggcgtgagaga  
 ttgctgatccgaaaaaccgttcgctttttggccagcagccggtgctcctagatgaacaggggcaatggcagcttgcgccgctcagctcgc  
 gtggcggtggcgtaggtgactccagccatgccacctgcccgaagaacaccgggctccagcacaggctcattccgagcactacgaaatgc  
 cggccgcatgacagcaggccttgatgctgtgttgcaacaagccctacgaccgaccgggattggcatggagtctactttgagagctatttcg  
 tggatcgtcagagttttggcgcgcaggggaaaagctttatgaggatgccggacattttcggcggttttctccgcccaagccgcaattg  
 cctccgctggcgccacctgttccatcgcacctgattgaacacgtcttcgcgagggtaacggcctggtttgagtgaaagcaccgaaatcggct  
 gccagcaaacggcgtgctgtfactcaacatcccgtcgtggccgaacagcgtgtaagattctgtatcagcaccctgctgaccgacaagcact  
 gtctaaactggcaggtatcgtcaactgggcaaaaagagccgctcaggctcgcacgaactcaagcattacctgcacgatcaccgcgggacg  
 ctgaacaattccagcaccgactacgactattaccacctcaatcaaggcagcgcacgctatggtatcaggtgacgaccgttgcgtcgtcagc  
 taccgtttctggaccatccggtattgagcgcagccaacgacacgactgcaataaaaaatgagcaatftttcggccatacgtcatcagcagc  
 gatgctcagcaccgcccgaacacgctgggttgccttgcctgaccagaagctggccacgaccacgacggggtattaggcattgccgaaatgc  
 agggcgtggtcagtgatgctccgcgacatcccggcagggcggccgacgcgcatcactaaaggcacagggcaactgccacgcgagggcac  
 gcagggcctgcgactcacgattgcgtttccgatccgacgctgattgtgccccaggcgcctaccgcacggtaccaaaactggacgacatgc  
 tctcagagaactgaggggcaaatctccgggtccgggggcaacgctggggccggcagtaggattcatccgtgacgagggcgtgctgg  
 cgggtgacgcgctgagggactggccgcagacagccgatgacggcaatccagcaatccctgaccgacctgtctatgagatgccactggac  
 actcgaacaacgcttcatcagctggcgaaactcgaagaaggggctcgcacatggagatttcttgaagaaagccagtagaaactgttgcac  
 gtattcgcctgcaccgcaaaaagctgcaaacaggatcggccttgatcagcgtgtacagttgccgctcgtccgacgatgccggcgtcaacc  
 ctccgacgaccacggcgcagctgttgaacgctgtaccagcacaccgatggcatcgtgacggcgagtcgatttttcggtcggcagcaagaaa  
 atgatcagcacaacctgccgttgcgtcgcagcaaacgtacgaacgctgtacatggagcacttgcaccgacttgcacaggggatctggat  
 cgcttttcgaaacagggcaaatgagcaaaacctgctcagcactgaaagtgtggtatcggggccatcgcaccgaccggacaaggtttacac  
 ctttgagcaactggtcatcaaggcgcagcagcagggatggaagtcgcgcatcagctgcgcagccagctaccacctgagtgccctgacaac  
 gatggtcaatcaccgtcagcaaatgatgaactatttgcgtcgcgacctgctcagggatcagcagctatgggctcacaagaatggatgc  
 gctggtcggcaacagccattccaatgtctatcaaggcgtcgtgcttggatcggcagctggaaggcggcagcagggctcggggtatcgcagctg  
 gcaccggggcagtcgaagggtgcatgcacgacctgggggagctggtctcggcagacatctcagaaccaaagtacacatcaaaaggcattat  
 cgagtggagatagaaataccgctgcgaaggatgcaatcggccacccagcctgttacctcgaacagcagctggccagaccgggattgttct  
 ggtggaagagagtgagggcaatctgctgaccattgtccaccgctcgcgacacctggattaccgcacccgggtgctggtcaatgccgaggg  
 caagctgtacctggagcgcgtgcgtgcccgcgatccacctcaaacctttgatgacatggacgcgctggtagcggcgtggagagatgaa  
 cctgacgcgggtaggctga

> *avrRps4<sub>Pto</sub>*

aggaactgcaagctggtgctggctccactaaaacctccgctctccacaagggtaaaaatgaggactcagggcctgctcctgcaccgtaattttt

gacaaagagggtttcaatgaatgcatttcaaccagctcagtaaattccagcttcaattacacggccctacggaggaagcgcaaaaccgcttcgc  
 ctacagcggccgacaattccctctagttgtcaccacaacatctatgcccaagcgtcgggaagggctacaaagccgggggcaacgtaagcatg  
 caggcccagcgcactgcccattgatggggagcccgctcagcagtcgggagggacacaatgttagctaaagctttgatgtcaacgcctaa  
 acattaacactcaagcaggtcttccaacagcccacactgaacgctcacaacacgctccaacaacgacacttcaaacctcgggctggtgggcta  
 gaaatcccagttacatccaactcctattgggcggcggcagggcaagtcataaattggctcactgacgcgagcgaagccaccgaccggtcaat  
 gatcaggaccgcccgccttccggcgcctgagcggctgcacgccgagttgttagagggtggccgattgagtttgcctagaggcgcaacg  
 tgttgccctcaaacgtgaggggatgacacatggacgagttcagatgacatcaactctaaagacggctgccaaggcattggcaccactggcctggga  
 ccctgcattgcagtggtgcaagaggcatggatagagaagggctccggctgctgggtgctatcaccacagtggtatcggctcaccagaggatac  
 catggctactcttgatcaagcagtgccgataaaggtgcttgcacaataactccctggtagccggcatgatcatgcctaaagagggaagggc  
 tggcagctatgacgagcgaagcttttggcattgaaagggcagttattcaatcgaagggcgcgcttgcatgatccgaagggcgaagaggacg  
 tgacataccggcgaggacaacagtgtaatgttctgctgatgcctgaccgcgttctgtacggcgcgacacgctctactgctga

> *corR<sub>P10</sub>*

aggaactgcaagctggtgcccctcactaaaacctccgctcctccacaagcgtaaaaatgaggactgcaggcctgctcctgcaccgtgatttttt  
 gacaaagagggtttcaatgaatgcatttcaaccagctcagtaaattccagcttcaattacacggccctacgaaggaaagcgcaaaaccgcttcgc  
 ctacagcggccgacaattccctctagttgccaccacaacatctatccccaaccctcgtgcagcctgctcactgataaaaaccacgctgat  
 ggactccaaaatcatcaattttcagtcgcatttaactcggctcgagcgcgctcgattgctggtggcagtgcatgaatgcagggcttttgcagtcagt  
 gctggttcgcccggcggatagactcaattaatgcggttcgaaaaacgcgataactgcaggtctaggccatttcgattacaggtcattacacctag  
 ggatactttacaggagatataagtatgtctatgccgagctcttgccttgctcattgatgatcagcttctgtccgttcaagcgtggccctgatgtgg  
 aaataaggctgcccgggtgtgacgacagtcagcgaagcaagtaggatcagcagggccttgcaccagcgttcccggcaccgatcctcctcct  
 cgtttgcagctggaaagtccaacggcctggaaggcatgccttggtgcaagcgcgtggccttggcgagggtggtgatgtgccccttg  
 atcgggatgagtcgtgagggcagaccagcggcgtgcgggtgagtttactcctaagacagagtgccagagcactactgcagcggatcca  
 ggcgctgctcttgagagcctcccgaaccgaggactatgcctccaccgggtgacgctcactcacgccagcgaagtgctcgggtgctgtg  
 gccagggattgacgaacaaggagatgcctcgcagctctggcgcctggagcacacggctccagccatgtccagggcactgacctcctcc  
 aagctcctgcccgtacggaggcagccgataaccggcggcggcctaggactcgtcctgtga

### ORFs identified by mini-Tn5 *mutagenesis* that are downstream of Hrp promoters but show no similarity to known virulence factors.

>ORF04349

tggaccagatctcgttcttccaccaagggcagatcagttcccggggaagcctatgatcaacctcaccacattgcttctcattggcggggc  
 agcgtcagcgattcgacaaagccgaagatggagcgcgcgataaacgctcgcgagccacatcgtctggcaagtcgcgttcaggtcaccagctc  
 attactggagcagaaggtctgcttaacgagcgtcagcagaagggctctcagatgattctgaaggccttgagcggcaaggagccggtgaacaat  
 gtcgagacgcacgaagggggaggccgattcaatctggcgcgagccgcttcgacgtggccagcgttcttgggagcgcgacaagtcgatgca  
 taactgatgagcttctggcgctcagcagcaagggcaagatgttctcctcggcagaagctggcggatgcaatggccaagcctgagc  
 ctggcaaggacaacagtgaggccacaatgcgcgcatgcttctcagcaactgaaactgaacaagttgatgaacacactcactgaccag  
 gttttcaacaagattcgccagtcgaacgggatcgcgtgcgacgaccatgccagaaccattctggagaccttacggcgcccaacagcaagcgc  
 gccgcgaacgcctcccggcactcggccacaagccaacagcggcccgccaccggccgaaagcagagccacgacctgctcggccggc  
 ctgacggcgcccaacagcagggcgcccggaaacgccgctcgtactgaccgcaggccaatagcactccgccaccggccgcaagcag  
 agccacgacctgctcggccggcctgacggcgcccagcagcaagcagcccggaaacgccgcccgcactcggccgagggcaacagc  
 acggccaccggcccaaggcagagccacgacctgctcggccggcctgacggcgccaacagcaagcagcccggaaacgccacct  
 cgcactcggcccaagcgaacagcgcggcctccggcggcccaagcagagccacgacctgctcggccggcctgacggcacccaacag  
 caagcagcccggaaacgccacctcgcactcggcccaagcgaacagcgcggcctccggcggcccaagcagaaccagcgcagggcg  
 cgaacggccttcaacggcgcgcccgaataacacatcggctgctgacgcatctgccaggggtgggagattccgcacctgccaagccggcctcaa  
 gccgttgtagcagcacttggcctcactgacatgctggtagacttatccgccgttaaaagggcttacagagatgccgcatgaagaaccacctga  
 taaaaccggcgaacgagggcagggcgccgagcgttcaaagtcatttcaaatgctacaagattttgcccaccggagtgcgcaaaagca  
 tacgacaacggcgtatcaatgaggctggtaatagggcatga

>ORF05707

tggaccggagcagggcttttaccactcaatggacaggtcttattgctaggtattaatgtcatgaatgcttcgaaccggctcagcttgaatacagcct  
 gaaaagctgggatacagatgccggcgtttgaggcctcgcggaagaagggctactgctgtgaaagggaaaacgaccagaccagcttgc  
 ggtgcccctggccgatctggtgactttctatcaacagcttgagctacatgaccccagcagcagggactgctggtgcccgttcattgcac

cttaacctgtcccctgtccatac gatgagcgcctgcatagcccctcgatgtcgagcaaaacacgttatgcctgcgctacacccatgaccttggcggg  
 agcggggctgataccctgttgcttgcgctc gaaaacgccaggc gctggccgaacaggtcaggcaggtgatc gaaacctcaggcgtgaccaa  
 gggcgtccgtccgggcaaacgtctttgtcccggcaatccagtctctgatgcgataa

>ORF01152

cggaaaccgaatccatatttcgaccacccatccagacaggtccgaaaacctcccgtcaggcagggaacgttcaggcacctgccacagctgac  
 ccaccaaaggacgcaagccgcgagtcagcacgtagccccagccccgagcaaacacgcctccccgtgccgccaggcagtttgaagaagt  
 gtcgcttccgccgcgacagcccttcgaacacgttttacgcaccaccgaatgcgcagtgctc gattactaccaccctgtattgatctgcgaactg  
 atatctgagccgatggagcccgtcatgaccttaagaatcaatactgttctgctacccgggtgtacctctg gaaacaggctctacatgcgagccg  
 acaccaccgccggctcacggcaagagc gactgagcctccccgcgccaatcctgcggcgcctaaatcagcggcagggtgtcagcaagcaca  
 cgggctgaagacgcgcacgctggcaagcttccgaacgtcagaccaatctcagctcgggattccggcactggctgactctcaaccggccctt  
 gcgcagcgggattccggaggaaggtgagcaggtatcgaacgaggagagtcgatgatccgtt gctcaaggaagcgcataactgcagcgtatgg  
 ggagtcggcgtgacctatctgaaggcggcaccgacgtctcttgggagcgtcccgccctcaacggtaaggcgtattaccaccaagattttc  
 cgtggctaaagcctgccccgtcgcgcaagtcgcaagcaatggcagcaacgccaaagaccaagatcaagatcaactcacgcaaagccctgaa  
 accatcgcagcggcgggtgaaagagctgagcaccggctc gatcaccagagcaaggtgctc gccacagccaccacgcactggctgctgcgc  
 gtgagcatcttgaatcgtcgaacaggccacccgcctcgtc gaccgaacctggaccatgccagggtcgcgttaacaagccgactccac  
 cccccctggccagtcagcaactcgtgagctgattcagggtacagacgtgttgaactgggcgcgctgagtgaaggcaggatcaggttga  
 cagaaagccgagtttcttag

>ORF07856

gggaacctgcgcaggtcattgaccactcagtggtcagcccggccttgtgtcgggtcgggtgctgtgcattccagcaagtcttcacggacagtttct  
 gtttcatctgccactgacggcgagccactttgggtgttttgataatgtggggcatgatttgcgagggttttacaggattgcagcgtccttgtgtgc  
 tctgtgtggtggctgtggccaggagc gcaagctggagagctttggcgggccaacctgggcagtcactattcagtggtgtatgtccgcgggtgcc  
 gggcagcctgaccegggtgtaatgcgccggaggtcgaagccattctggctgacgtc gatcaacagatgctgctgtggcgcagtgactcggac  
 atcagcgtttcaatgcgctgccagccaacagctgccagatcatgtccacgtcggtttgcacctatccgcgttggcagcagctgtcccgtgaaa  
 gcgacgggtgtttcgatttgaccgtcaagccgtgatggactgtgggggctgggcgctcatgcgctgttgaacagatccgctgggtgcggcag  
 ctggccccgaccgtacgtgtgggttatcgaaacctgcgcacgtcgggcagcagttgtgcaagaacgctgccgtgcaagtggacctcaaca  
 gcatcggccgggttacgcagtagaccgtatcactgagcggatggacgcgcttggcgtgcacgactacatggtccaggccactggcgaactga  
 aagtcagcggcctcaaacccgatggctcgcctggcgtgtaaaccttgatgcaccgagc gatgacgggtacgacgcaccaaattgtcccgt  
 cactggccacgccatgtcgcacctcgggcgattatcgtcgttacagggcggcaacggcgccatattccgacacgctcgcgctgttaccggc  
 agtccggtaaatcaggtctggcctcgggtgacagtgcttccctcggcgtgatggctgacggctctcttcgctgctgttattctcggccccga  
 cggggctggaattatgcgcaagaacacaaaatccctgctttttgtgattcgtgccgataagcgtttatcattcgcagcaacgcgctgtttgatc  
 cctggctgtgaggtcgtcgcagtaa