

S9 Fig.

DENV1

GGTACCGGTGCCCAAGGGGAAACCTTAGGTGAAAAATGGAACGCCAGCTGAATCAGCTTTCCAAAAGCGAGTTCAACACGTATAAACGGTC
CGGAATTATCGAGGTCGATCGCTCTGAAGCAAAAGAAGGCTTGAACCGTGGTGAGCCGACCAAAATCGCGTAAAGTCGCGGCACAGCGAAAT
TACGCTGGTTCGTGGAACGCAATCTGGTTAAACCAGAGGGTAAAGTTATCGATCTGGGTTCGCGCCGTGGTGGGTGGTCTTACTATTGTGCC
GGTCTGAAAAAAGTACCAGGAAAGTAAAGGCTACACGAAAGCGGTCCTGGTCACGAAAGAACCGATTCCGATGGCCACGCTACGGCTGGAACCT
GGTCAAACGTATTTCGGGCAAAGATGTCTTCTTTACGCCCGCCGAAAAATGCGATACGCTGCTGTGTGACATTGGAGAGTCTAGCCCAAAC
CGACCATTGAAGAAGGTCGTACGTTGCGCGTCTGAAAGATGGTGAACCTTGGCTTCGTGGCAATCAGTTTTGCATCAAGATTTTAAACCC
TACATGCCAAGCGTCGTGAAACTCTTGTAGCAAATGCAGCGCAAACATGGTGGCATGCTCGTTCCGATCCGCTGTCTCGCAACTCAACCCA
CGAAATGTACTGGGTAGCTGTGGTACCAGAAACATCGTATCGCGGTGAATATGACTTCCCGTATGTTGCTGAATCGCTTTACGATGGCTC
ATCGTAAGCCGACGTATGAACCGGATGTGATCTCGGCGCAGGGACCAGGCATGTGGCAGTGAACCGGAAGTGGCAATTTAGACATTATT
GGCCAGCGCATAGAAAACATCAAAAATGGCCATAAGAGTACATGGCATATGATGAGGATAACCCCTATAAGACGTGGGCTTATCACGGTTC
GTATGAAGTGAACCGAGTGGTTCAGCCTCGTCAATGGTAAATGGGGTGGTTCGCTTGTAAACCAAGCCTTGGGACGTGATCCCTATGGTTA
CCGAGATTGCTATGACTGATACGACCCCTTTGGACAACAGCGGTTTTCAAGGAGAAAGTCGATACACGGACCCAAAAGCAAACCGGGC
ACCGCCAAATATGGAAGTTACCGCTCGTTGGCTTTGGGGCTTCTCTCGCGCAACAAAAACCGGCTATATGCACACGTGAAGAATTTAC
GAGAAAAGTGCAGTCGAACCGCCCAATCGGTGCCGTGTTCTGTGGACGAGAACCAGTGAACAGCGGAAAAGAGCTGTGGAAGACGAGCGCT
TTTGGGATTTGGTTCATCGTGAACGGGAACGACAAACAGGGCAAATGTGCCACTTGTGTGTACAACATGATGGGGAACCGGAAAAA
CTGGGCGAGTTTGGCAAAGCCAAAGGTAGCAGAGCGATTTGGTACATGTGGCTGGGCGCGGATTTCTGGAGTTCGAAGCTCTGGGTTTAT
GAATGAGGATCAGTGGTTTAGCCGTGAAAACCTACTAAGCGGTGTTGAAGGGGAAGGCTTACATAAACTGGGCTATATCCCTGCGTGCATTT
CCAAGATTCGGGTGGCAACATGTACGCCGATGACACCGCAGGCTGGGATACCCGATTACCGAGGACGACTTGCAGAATGAGGCTAAGATC
ACGGACATAATGGAACCGGAACATGCATTGCTTGGCACTAGTATTTTCAAACCTACGTACCAGAATAAAGTAGTCCGGGTTACGCGACCGGC
GAAAAACGGGACTGTAATGGATGTCTTAGTCTGTGACCAACCGTGGATCTGGACAAGTAGGGACCTATGGGCTGAATACCTTACCAATA
TGAAGCGCAGCTGATTAGACAAATGGAATCGGAAGGCATCTTTTCGCCAAGCGAACTGGAGACCCAAAACCTGGCTGAACCGCTCTTAGAC
TGGTGAATAAACATGGCACCAGCTCTTAAGCGTATGGCAATCTCCGGTGTGATGATTGCGTGGTCAAGCCGATCGACGATCGTTTGGGAC
AGCGCTGACTGCGCTGAACGATATGGGGAAGTTTCGAAAGATATCCCGCAATGGGAACCAAGCAAAGGATGGAACGATTTGGCAGCAGGTTT
CGTTTTGCAGTACCATTTCACCAGCTGATCATGAAAGATGGCCGTGAAATCGTGGTTCGCTGCCGGAATCAAGACGAGTTAGTAGCCGC
GCCGAGTTTCTCAAGGCGCTGGTTGGTCACTGCGTGAACGGCATGTCTGGGTAAATCCTATGCGCAAAATGTGGCAGCTCATGTACTTTCA
TCGTGCGATTTACGCTGCGCAGCAACGCCATTTGCAGTGGGTGCCCGTGGATTTGGGTTCTTACGTCACGCACAACCTGGAGCATTCACG
CGCATCATCAGTGGATGACCACGGAAGACATGCTGAGCGTGTGGAACCGCGTGTGGATCGAAGAAAATCCGTTGGATGGAGGATAAACACAC
GTGAGCTCTTGGGAAGATGTACTTTATCTTGGCAAACGAGAAGATCGTTGGTGTGGTTCCTGATTGGCCTCACTGCACGTGCGACCTGGGC
GACTAATATCCAGGTGGCGATTAATCAGGTGCGCCGCTGATTGGAATGAGAACATATCTCGACTTATGACTAGCATGAAACGCTTCAAGA
ACGAGAGTGATCCCGAAGCGCGCTGTGG

DENV2

GGCACCGGCAACATTGGCGAAACCTGGGCGAAAAATGAAAAAGCCGCTGAAACGCGCTGGGCAAAAGCGAATTTAGATTATAAGAAAAA
CGGCATTTCAGGAAGTGGATCGTACCCTGGCGAAAGAAGGCATTAACCGTGGCGAAACCGATCATCATGCCGTGAGCCGTGGCAGCGCGAAAC
TGCGTTGGTTTGTGGAACGTAACATGGTGAACCCCGAAGGCAAAGTGGTGGATCTGGGCTGCGGCGTGGCGGCTATTATTATTCGGGC
GGCTGAAAAACGTCGTTGAAGTGAAGGCTGACCAAGGCGCCCGGCCATGAAGAACCGATTCCGATGACCACTATGGCTGGAACCT
GGTGGCTGCAAAGCGCGTGGATGTGTTTTTACCCTGCGGAAAAATGCGATACCCGCTGTGTGCGATATTGGCGAAAGCAGCCGAAAC
CGACCGTGAAGCGGCGCTACCCTGCGTGTGCTGAACCTGGTGGAAAACTGGCTGAACAACAACACCCAGTTTTGCATTAAGTGTGTAAC
CGTATATGCCGAGCTGATTGAGAAAAATGGAAGCGCTGCAACGTAATATGGCGCGCGTGGTGCATAACCGCTGAGCCGTAACAGCAC
CCATGAAATGTATTGGCTGAGCAACCGCAGCGGCAACATTGTGAGCAGCGTGAACATGATTAGCCGTATGCTGATTAACCGTTTTACCATGC
GTCATAAGAAAGCGACCTATGAACCGGATGTGGATCTGGGCGAGCGCACCCGTAACATTGGCATTGAAGCGAAATTCGGAACCTGGATATT
ATTGGCAAACGTTATTGAGAAAAATTAACAGGAACATGAAACCGAGTGGCATTATGATCAGGATCATCCGATATAAAACCTGGGCGTATCATGG
CAGCTATGAAACCAAACAGACCGGCGAGCGAGCAGCATGGCAACGGCGTGGTGGCTGCTGACCAAAACCGTGGGATGTGGTGGCGATGG
TGACCCAGATGGCGATGACCGATACCACCCGTTTTGGCCAGCAGCGTGTGTTTTAAGAAAAAGTGGATACCCGTACCCAGGAACCGAAAGAA
GGCACCAGAAACTGATGAAAAATACCCTGGAATGGCTGTGGAAGAACTGGGCAAAAGAAAACCCCGCTATGTGCACCCGTGAAGAATT
TACCCTGAAAGTGCCTAGCAACCGCGCGCTGGGCGGATTTTTACCGATGAAAACAAATGGAAAAGCGCGCTGAAGCGGTGGAAGATAGCC
GTTTTTGGGAACTGGTGGATAAAGAACGTAACCTGCATCTGGAAGGCAAAATGCGAAACCTCGCTGTATAACATGATGGCAACCGTGAAGAA
AACTGGGCGAATTTGGCAAAGCGAAAGGCGAGCCGTCGATTTGGTATATGTGGCTGGGCGCGCTTTCTGGAAATTTGAAGCGCTGGGCTT
TCTGAACGAAGATCATTTGGTTTAGCCGTGAAAAACAGCCTGAGCGGCGTGGAAAGCGAAAGGCTGCATAAAACCTGGGCTATATTCTGCGT
TGAGCAAGAAAGAAAGCGCGCGATGTATGCGGATGATACCCTGGGATACCCGATTTACCTGGAAGACCTGAAAAACGAAGAAATG
GTGACCAACCATGGAAGGCGAACATAAGAACTGGCGGAAGCGATTTTTAAACTGACCTATCAGAATAAAGTGGTGGCTGTGACGCTCC
GACCCCGCTGGCACCGTGTGATGATATTATTAGCCGCTGTGATCAGCGTGGCAGCGGCCAAGTGGGCACTTATGGCTGAACACCTTTACCA
ACATGGAAGCGCAGCTGATTCGTCAGATGGAAGGCGAAGGCGTGTAAAAAGCATTTCAGCATCTGACCGTGAACGAAAGAAATGGCGTGCAG
AAGTGGCTGGCGCTGTGGGCGTGAACGCTCTGAGCCGATGCGGATTTAGCGCGATGATGCGTGGTGAACCGCTGGATGATCGTTTTGCG
GAGCGCGCTGACCGCGCTGAACGATATGGGCAAAGTGCCTGAAAGATATTTCAGCAGTGGGAACCGCTCTCGTGGCTGGAACGATTTGACCCAGG
TGCCGTTTTGCAGCCATCATTTTTCATGAACTGATTATGAAAGATGGCCGTGTTCTGGTGGTGGCGTGGCGTAACCGGATGAACTGATTGGT
CGTGCAGTATTAGCCAGGCGCGGTTGGAGCCTGCGTGAACCGCATGCCTGGGTAAGCTATGCGCAGATGTGGAGCTGATGTATTT
TCATCGTCTGATCTGCGTCTGGCAGCAACCGGATTTGCAGCGCGTGGCAGCCATTGGGTGCCGACCGCTACCCTGGAGCATTC
ATGCGAAACATGAATGGATGACCACCGAAGATATGCTGACCGTGTGGAACCGTGTGGATTCAGGAAAACCCGTTGGATGGAAGATAAAAC
CCGGTGAAGCTGGGAAGAAATCCGATCTGGGCAAACGTGAAGATCAGTGGTGGCGCAGCCTGATTGGCTGACCGCGCTGCGACCTG
GGCAGAAACACTTGCAGCCGATTAACCAAGTGGTGGCTGATTGGCAATGAAGAATATACCGATTATATGCCGAGCATGAAACGTTTTTC
GTAAGAAAGAAAGAAAGCGGCGTGTGG

S9 Fig. (continued)

DENV3

GCACAGGCAGTCAAGGCCAAACTCTGGGTGAAAAGTGAAGAAACGTTTAAACCAGCTTTACGCAAGGAGTTCGACTTATACAAGAAAAG
CGGAATTACCGAAGTGGACCGCACCGAGGCCAAAGAAGGTCTGAAACGTGGGGAGATTACCCATCATGCTGTTTTCCCGTGGCTCGGCAAAAC
TGCAGTGGTTCGTAGAACGCAATATGGTGTATCCCTGAAGGCCGCGTTATCGACCTGGGCTGTGGTTCGGGGCGGTTGGAGTTATTATTGCGCC
GGGCTTAAGAAAAGTTACTGAAGTACGTGGTTACTATAAGGAGGACCGGGCCACGAAGAACCAGTACCGATGAGTACCTACGGCTGGAATAT
CGTCAAGCTGATGTCGGGGAAAGACGTGTTTTATCTGCCACCGGAGAAAATGCGACACCCCTTCTGTGCGATATGGTGAATCCTCGCCAAGTC
TACCCGTGGAAGAGTCCCCTACGATTCGCGTTCTGAAAATGGTCAACCCGTGTAACCCGTGATCTGTATCAAAGTGCCTCAATCCG
TATATGCGCACCGTAATCGAACACTTAGAGCGCTTACAGCGCAAGCACCGGTGGCATGCTGGTTCGTAACCCGCTGAGCCGTAACCTACTCA
CGAAATGTACTGGATCAGCAATGGTACGGGAAACATCGTATCAAGCGTCAATATGGTGTACGCGCTGTTGCTGAACCGTTTTACCATGACGT
ACCGTCGCCGACTATCGAGAAAAGACGTGATTTGGGCGCAGGCACCCGCCACGTGAACGCTGAACCAGAAAACGCAACATGGATGTTATC
GGGAACGCATTCCGCGCATCAAAGAAGAGCACTCCTCTACCTGGCATTACGACGATGAGAACCCTATAAAAACGTGGGCATATCATGGCTC
GTATGAAGTGAAGGCGACAGGATCCGCCTCTAGCATGATTAATGGAGTGGTGAACCTGTTAACCAAACCGTGGGATGTCGTACCGACCGTTA
CACAGATGGCGATGACCGACACTACGCCCTTTGGACAACAGCGTGTGTTAAAGAAAAGGTGACACTCGTACGCCCAAACCCATGCCTGGC
ACGCGCAAAGTGTAGGAGATTACGCGCGGGTTGGCTCTGGCGTACGCTGGGTTCGTAACAAACGTCGCGCCCTGTGTACTCGCGAAGAATTTAC
TAAAAAAGTGGCACCATGCGGCTATGGGCGCGGTGTTTACGGAGGAAAACAGTGGGACAGCGCACGCGCTGCAGTAGAGGACGAAGAAT
TCTGAAACTGGTGGACCGGAGCGTGAATTACACAAGCAAGGTAATGCGGAAGTTGCGTCTATAATATGATGGGCAAGCGGAAAAA
CTGGGTGAATTCGGTAAAGCTAAAGGCTCTCGGGCAATTTGGTACATGTGGCTGGGTGCGGTTATCTGGAATTTGAGGCCCTCGGTTTTCT
GAACGAAGATCATTGGTTTTCCCGCGAGAACAGCTATAGTGGTGTGAAGGGGAAGGCCTGCATAAATGGGCTACATTTCTCGGGATATCA
GCAAAATTCGGGCGGGGCCATGTATGCCGATGATACAGCAGGGTGGGATACCCGCATTACCGAAGATGACTTGCACAATGAAGAGAAAAT
ACGCAGCAAATGGATCCCGAACATCGCCAGCTTGGGAACGCCATTTTCAAACCTGACCTATCAGAACAAGTTGTCAAGGTTACGCGTCTAC
CCCAAAGGGGACCGTTATGGATATTATCTCACGAAAAGATCAGCGGGCTCTGGTACAGTTGGTACCTACGGCCTAACACATTCACGAACA
TGGAAAGCCAGTTAATTCGTGATGGAGGGTGAAGGTGTCTGTGCAAAAACCGACCTGGAGAACCAGCATCTCTGGAAAAAATCACC
CAGTGGCTTGAACGAAAGGGTGGAGCGCTGAAACGATGGCGATTTCCGGCGATGATTGTGTGGTCAAACCGATTGATGATCGGTTTGC
CAATGCATTTGTTAGCACTGAACGATATGGGCAAAGTCCGCAAAGACATTCGCGAATGGCAACCGAGTAAAGGTTGGCATGATTGGCAGCAAG
TTCCGTTCTGCTCGCATCACTTTCACGAACTCATTATGAAAGACGGACGCAAAATGGTGTGCCGTGTCGTCCACAGGATGAACCTTATTGGC
CGTGTCTGATTTCAACAGCCGCGGTTGGTCACTGAAGGAAACAGCGTGTCTCGGCAAAGCCTATGCGCAAATGTGGGCGCTGATGACTT
TACCCGCGTATGATCCAGCTGGCGTCTAATGCAATCTGCGACGCGCTACCGTTTATTGGGTGCCAACGCTACCACCTGGAGCATTTC
ATGCCATCATCAGTGGATGACTACGGAAGATATGCTGACCGTGTGGAATCGCGTGTGGATCGAAGATAATCCTTGGATGGAAGATAAAACG
CCCGTAACCACCTGGGAAGATGTTCTTATCTGGGCAAACCGGAGGATCAATGGTGGCGGTTTAAATCGGCTGACCTCCCGCGCTACATG
GGCGCAGATATCCTGACAGCGATTACGCAAGTCCGTAGCCTGATCGGTAATGAGGAATTCCTGGATTACATGCGGAGCATGAAACGCTTTC
GCAAAGAAGAAGAGAGCGAAGCGCGATTGG

DENV4

TCCTTGATTAATAATGCCAAACACCGCGCGTGGTACGGGCACGACCGCGCAAACGCTTGGCGAAAAGTGAACAGCCAGTTGAACAGCCT
TGATCGCAAAGAGTTCGAGGAATATAAGCGATCAGGTATACTGGAAGTCGATCGAAGTGAACGAAAAGTGCCTCAAAGATGGCAGTAAAA
TCAAATATCGGGTATCCCGTGTACAAGCAAAATTCGGTGGATTGTTGAACGCGGTATGGTTAAACC GAAAGGCAAAGTTTGGATTGGGG
TGTGGACGCGGTGGTTGGAGCTACTACATGGCGACTCTGAAGAATGTCACTGAGGTGAAGGGCTATACGAAAGCGGTCCGGGCCATGAGGA
ACCCATCCCGATGGCCACCTATGGCTGGAATCTGGTGAACCTGCATTCGGGTGTTGACGTGTTCTATAAACCGACCGAACAGGTTGACACGC
GTTGTGGGACATGGTGTAGAGCTCTTCAATCCCAATCGAAGTGGTGCACGCTGCGCGTGTAAAATGGTTGAACTTGGCTTCTTCT
AGCAAACCGGAGTTTTGCATCAAAAGTCTTGAATCCGTATATGCTACCGTGAATGAGGAATTGGAAAAACTGAAAAGAAAACATGGCGGTAG
TCTAGTTCGCTGTCTCTGTCTCGCAATTAACCCACGAAATGTACTGGGTTAGCGGGTTTCTGGTAAACATTGTGTCTCGCTCAACACTA
CCTCGAAGATGCTGTGAATCGTTTACGACTCGTACCGTAAACCAACCTACGAAAAGGATGCGAGATTTAGGCGCTGGCACACGCTCCGTC
TCCACCGAAACCGAAAAGCCGGACATGACGATAATTTGGGAGACGCTTACAACGCTTACAAGAGGAGCAACAAGGAAACCTGGCATTATGACCA
CGAAAACCCGATCGGACTTGGGCATATCATGGGTCTATGAAGCGCCATCAACCGGAAGTGCACGACGATGGTGAACGGTGTGTGAAAC
TCTTAACCAAACCGTGGGATGTGGTACCGATGGTGAATCACTGGCTATGACCGATACCCACCGCTTGGTGCAGCAGCGCGTGTTCGAAAG
AAAGTCGATACGCGAACCCTCAGCCCCAAACCGGGGACTCGTGTGGTGTGACTACCCACCGCAACTGGCTGTGGGCACTGTGGGCGCTAA
GAAAAACCCAGTTTTGTGTACGCGCAAGAATTTATCTCAAAAGTCCGCTCTAATGCAGCCATCGGTGCAGTGTTCAGGAAGAACAAGGTT
GGACATCTCGCTCAGAGCCGTAATGATAGCCGTTTTGGGAACTGGTGCATAAAGAACGCGCCCTCCATCAGGAAGGCAAATGCGAGTCG
TCCGTGTATAACATGATGGGGAAACGCGAGAAGAAACTGGGAGAGTTTTGGTTCGTGCGAAAAGGCTCTCGTGCCATCTGGTACATGTGGCTCGG
CGCACGCTTCTTGAATTTGAAGCGTTAGGATTTTTAAACGAAAGATCACTGGTTTTGGCCGTGAGAACCTGTGGTCTGGCGTAGAGGGAGAAG
GCCTGCATCGTCTGGGTTACATTCGGAAGATATCGACAAAAAGACGGGGACTTGATCTACGCTGATGATACCGCTGGTTGGGACACTCGT
ATCACCAGAGATGACCTGCTGAACGAAGAGCTGATCACGGAACAGATGGCGCCGATCACAAAATTCGGCTAAAGCGATCTTTAAGTTAAC
CTATCAGAACAAGTGGTTAAAGTACTCCGTCCAACGCGGAAAGGAGCCGTGATGGACATTATTAGTCGGAAGATCAACGTGGTTCTGGTC
AGGTGGGTACCTATGGCCTGAATACGTTACGAAATATGGAAGTTCAGCTGATTCGTGATGGAAGCGGAAGGAGTCACTACTCGTGTATGAC
ATGCATAACCCAAAAGGCTGAAAGAGCGAGTGGAGAAATGGCTGAAAGAGTGTGGAGTAGACCGCTTGAAGCGCATGGCGATCAGCGGGGA
TGATTGCGTAGTGAAGCCTCTGGACGAACGCTTTAGCACGTCGCTTCTGTTTTGAAACGATATGGGCAAAGTGGCTAAAGATATTCCCAGT
GGGAACCTAGCAAGGGGTGAAAAATTTGGCAAGAGTACCGTTCTGCAGCCACCATTTCCACAAGATTTTCATGAAGGATGGCCGTTCTGCTG
GTGGTCCCGTCCGCAATCAGGACGAACCTATTGGCCGCGCTCGGATTTACAGGGTGGCGGCTGGAGCCTCCGCGAAACCGCGTGTCTGGG
CAAAGCGTACGCCCCAATGTGGTCCCTGATGTACTTTTATCGTGGGATTTACGCTTGGCTCAATGGCAATATGCTCCGCGGTTCCAACCG
AATGGTTTTCAACATCGAAGAACCTGGAGTATTCATGCCATCACAGTGGATGACCACGGAAGATATGCTGAAAGTCTGGAACAGGGTT
TGGATCGAAGACAACCCCAATATGATCGATAAAACCCCGTCCATAGCTGGGAAGACATTCGATCTCGGCAAACGTTGAGGATCTTTGGT
TGTTTCTTGAATGGCCTGAGTAGTCGGGCGACATGGGCTAAAAACATTCAGACCGCAATCACCCAGGTGCGTAACTTAATCGGCAAAGAAG
AATACGTTGATTATATGCGGTAATGAAACGTTACAGTGCACACTTTGAAAGCGAAGGGGTTTTA

S9 Fig. Synthesized DNA sequences of the full-length DENV1-4 NS5 proteins used in this study.