

QR94 GTTTTGTGGTAGAAAAACATGAGACAGAACAAAAGTCAGGTCGGATTAAGCCATAGTACGGGAAAAACTATGCTA  
EM33 GTTTTGTGGTAGAAAAACATGAGACAGAACAAAAGTCAGGTCGGATTAAGCCATAGTACGGGAAAAACTATGCTA

QR94 CCTGTGAGCCCCGTCCAAGGACGTTAAAAGAAGTCAGGCCACTTTGATGCCATAGCTTGAGCAAACAGTGCAGCC  
EM33 CCTGTGAGCCCCGTCCAAGGACGTTAAAAGAAGTCAGGCCACTTTGATGCCATAGCTTGAGCAAACAGTGCAGCC

QR94 TGTAGCTCCACCTGAGAAGGTGTAAAAAATCCGGGAGGCCACAGACCATGGAAGCTGTACGCATGGCGTAGTGGA  
EM33 TGTAGCTCCACCTGAGAAGGTGTAAAAAATCCGGGAGGCCACAAAACCATGGAAGCTGTACGCATGGCGTAGTGGA

QR94 CTAGCGGTTAGAGGAGACCCCTCCCTTTCAGATCGCAGCAACAATGGGGGCCCAAGGTGAGATGAAGCTGTAGTC  
EM33 CTAGCGGTTAGAGGAGACCCcTCCCTTTCAGATCGCAGCAACAATGGGGGCCCAAGGTGAGATGAAGCTGTAGtC

QR94 TCACTGGAAGGACTAGAGGTTAGAGGAGACCCCCCAAAGACAAAAACAGCATATTGACGCTGGGAAAGACCAGA  
EM33 TCACTGGAAGGACTAGAGGTTAGAGGAGACCCCCCAAACAAAAACAGCATATTGACGCTGGGAAAGACCAGA

QR94 GATCCTGCTGTCTCCTCAGCATCATTCAGGCACAGGACGCCAGAAAATGGAATGGTGCTGTTGAATCAACAGGT  
EM33 GATCCTGCTGTCTCCTCAGCATCATTCAGGCACAGGACGCCAGAAAATGGAATGGTGCTGTTGAATCAACAGGT

QR94 TCT  
EM33 TCT

PR159 GTTTTGTGGTAGAAAAACATGAGACAGAACAAAAGTCAGGTCGGATTAAGCCATAGTACGGGAAAAACTATGCTA  
EM41 GTTTTGTGGTAGAAAAACATGAGACAGAACAAAAGTCAGGTCGGATTAAGCCATAGTACGGGAAAAACTATGCTA

PR159 CCTGTGAGCCCCGTCCAAGGACGTTAAAAGAAGTCAGGCCACTTTGATGCCATAGCTTGAGCAAACAGTGCAGCC  
EM41 CCTGTGAGCCCCGTCCAAGGACGTTAAAAGAAGTCAGGCCACTTTGATGCCATAGCTTGAGCAAACAGTGCAGCC

PR159 TGTAGCTCCACCTGAGAAGGTGTAAAAAATCCGGGAGGCCACAGACCATGGAAGCTGTACGCATGGCGTAGTGGA  
EM41 TGTAGCTCCACCTGAGAAGGTGTAAAAAATCCGGGAGGCCACAAAACCATGGAAGCTGTACGCATGGCGTAGTGGA

PR159 CTAGCGGTTAGAGGAGACCCCTCCCTTTCAGATCGCAGCAACAATGGGGGCCCAAGGTGAGATGAAGCTGTAGTC  
EM41 CTAGCGGTTAGAGGAGACCCcTCCCTTTCAGATCGCAGCAACAATGGGGGCCCAAGGTGAGATGAAGCTGTAGtC

PR159 TCACTGGAAGGACTAGAGGTTAGAGGAGACCCCCCAAACAAAAACAGCATATTGACGCTGGGAAAGACCAGA  
EM41 TCACTGGAAGGACTAGAGGTTAGAGGAGACCCCCCAAACAAAAACAGCATATTGACGCTGGGAAAGACCAGA

PR159 GATCCTGCTGTCTCCTCAGCATCATTCAGGCACAGGACGCCAGAAAATGGAATGGTGCTGTTGAATCAACAGGT  
EM41 GATCCTGCTGTCTCCTCAGCATCATTCAGGCACAGGACGCCAGAAAATGGAATGGTGCTGTTGAATCAACAGGT

PR159 TCT  
EM41 TCT

QR94 GTTTTGTGGTAGAAAAACATGAGACAGAACAAAAGTCAGGTCGGATTAAGCCATAGTACGGGAAAAACTATGCTA  
PR159 GTTTTGTGGTAGAAAAACATGAAACAAAACAGAAGTCAGGTCGGATTAAGCCATAGTACGGGAAAAACTATGCTA

QR94 CCTGTGAGCCCCGTCCAAGGACGTTAAAAGAAGTCAGGCCACTTTGATGCCATAGCTTGAGCAAACAAGTGCAGCC  
PR159 CCTGTGAGCCCCGTCCAAGGACGTTAAAAGAAGTCAGGCCACTTTGATGCCATAGCTTGAGCAA-CTGTGCAGCC

QR94 TGTAGCTCCACCTGAGAAGGTGTAAAAAATCCGGGAGGCCACAAGACCATGGAAGCTGTACGCATGGCGTAGTGGA  
PR159 TGTAGCTCCACCTGAGAAGGTGTAAAAAATCCGGGAGGCCACAAGACCATGGAAGCTGTACGCATGGCGTAGTGGA

QR94 CTAGCGGTTAGAGGAGACCCCTCCCTTTCAGATCGCAGCAACAATGGGGGCCCAAGGTGAGATGAAGCTGTAGTC  
PR159 CTAGCGGTTAGAGGAGACCCCTCCCTTACAGATCGCAGCAACAATGGGGGCCCAAGGTGAGATGAAGCTGTAGTC

QR94 TCACTGGAAGGACTAGAGGTTAGAGGAGACCCCCCAAGACAAAAACAGCATATTGACGCTGGGAAAGACCAGA  
PR159 TCACTGGAAGGACTAGAGGTTAGAGGAGACCCCCCAAAACAAAAACAGCATaTTGACGCTGGGAAAGACCAGA

QR94 GATCCTGCTGTCTCCTCAGCATCATTCAGGCACAGGACGCCAGAAAATGGAATGGTGCTGTTGAATCAACAGGT  
PR159 GATCCTGCTGTCTCCTCAGCATCATTCAGGCACAGGACGCCAGAAAATGGAATGGTGCTGTTGAATCAACAGGT

QR94 TCT  
PR159 TCT

**Additional file 2:** Nucleotide alignments of the 453 nt 3'UTRs of American genotype DENV2-QR94, PR159, EM33, and EM41. Mismatches are highlighted in red.