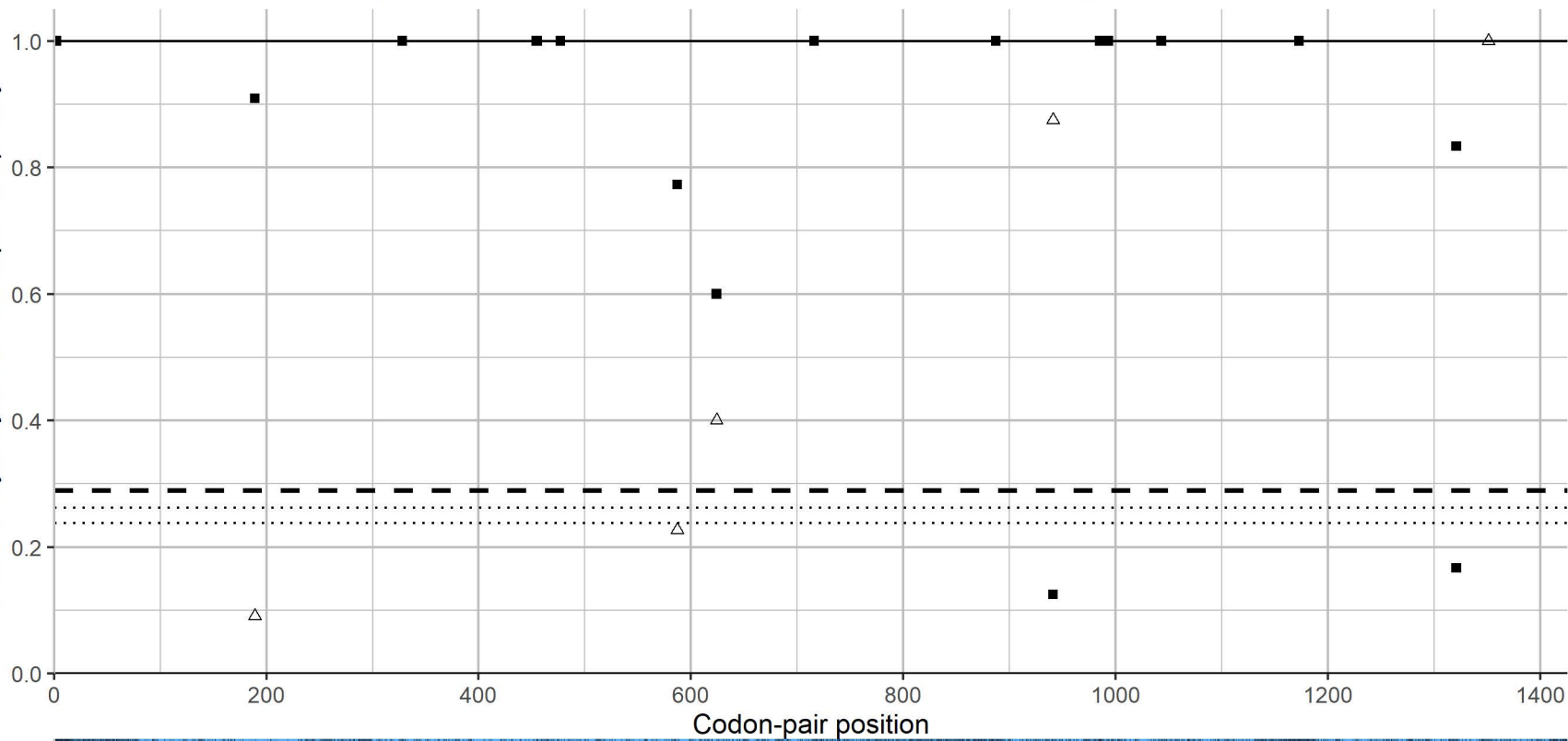


Supplementary File 12 Legend (Figure S6):

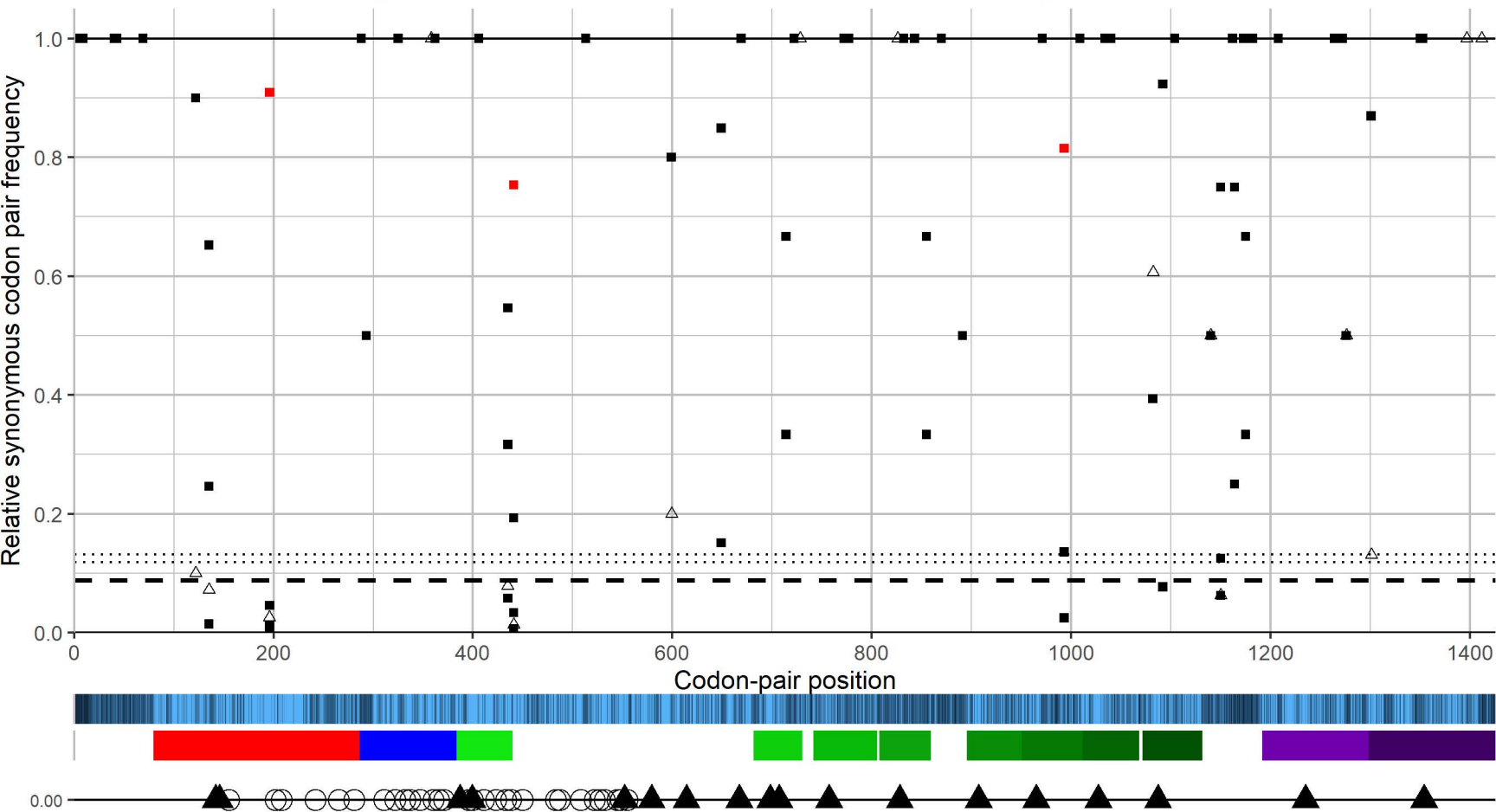
Examples of position-specific codon-pair usage bias in the top three quartiles of each human reference gene. To highlight potential position-specific optimization candidates, open triangles and closed squares were colored red if they were the most biased codon-pair synonymous with human. See the legend of Figure 3 for the definition of color keys for each information bar.

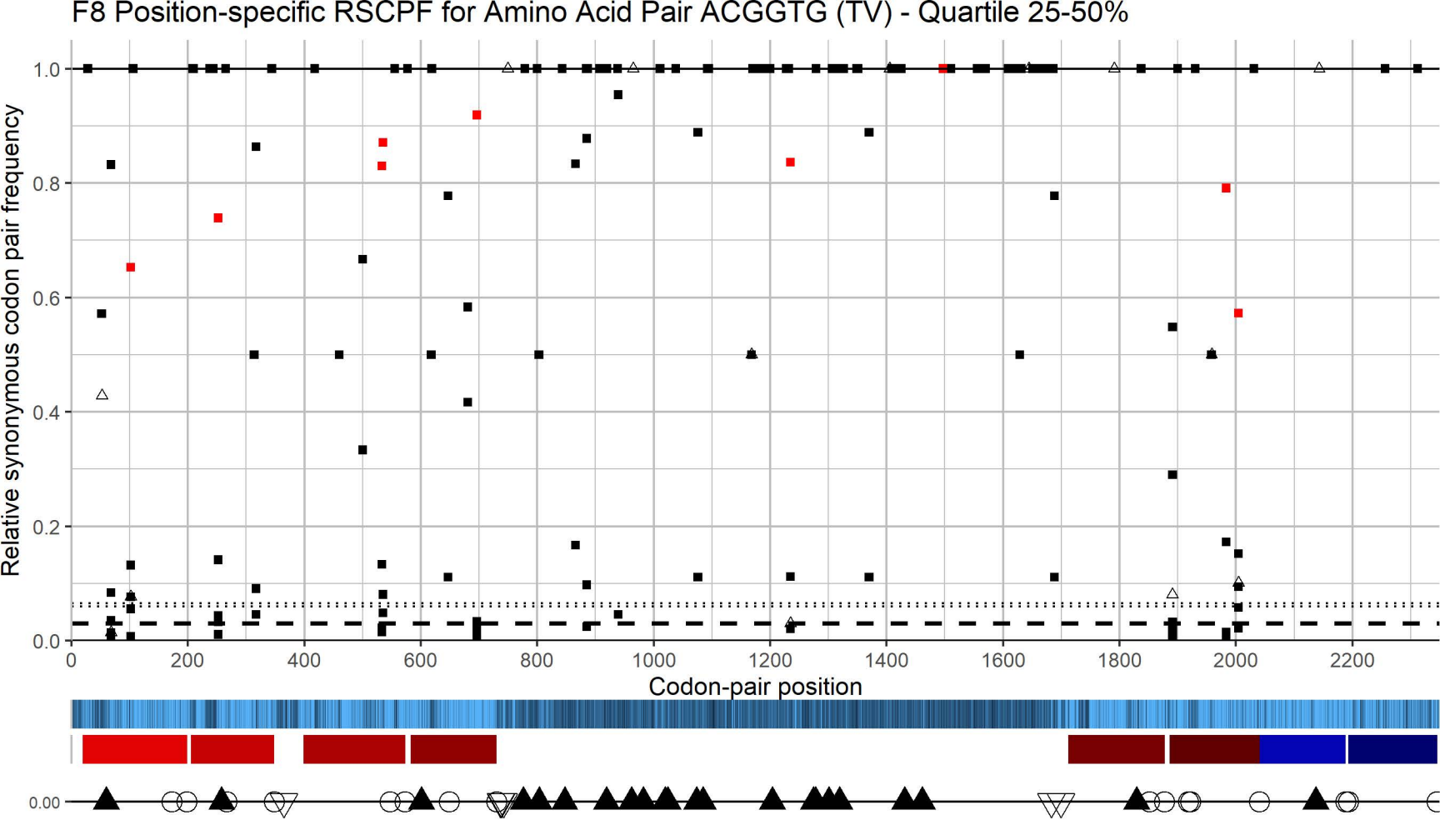
ADAMTS13 Position-specific RSCPF for Amino Acid Pair AATCAG (NQ) - Quartile 25-50%

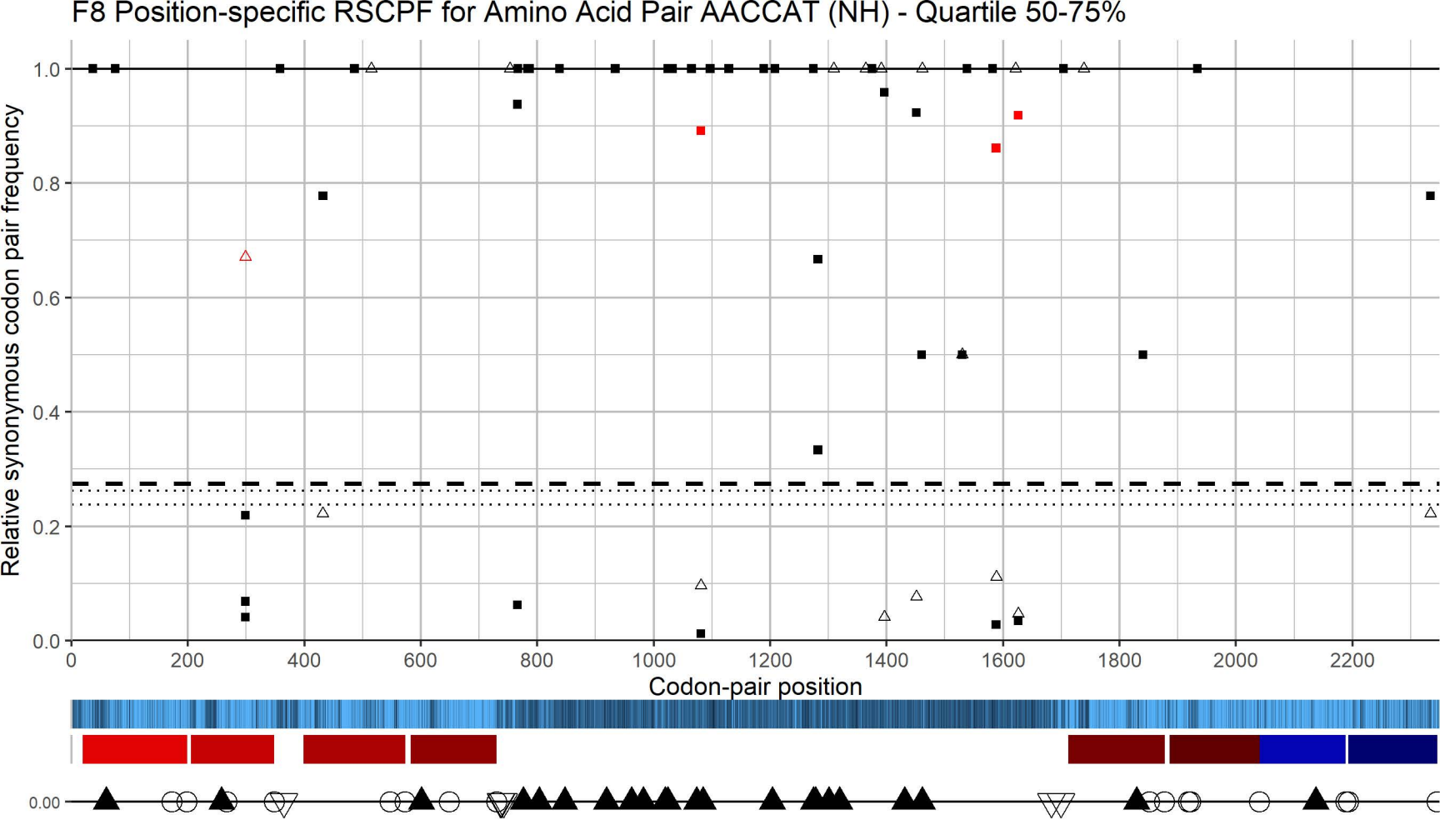
Relative synonymous codon pair frequency



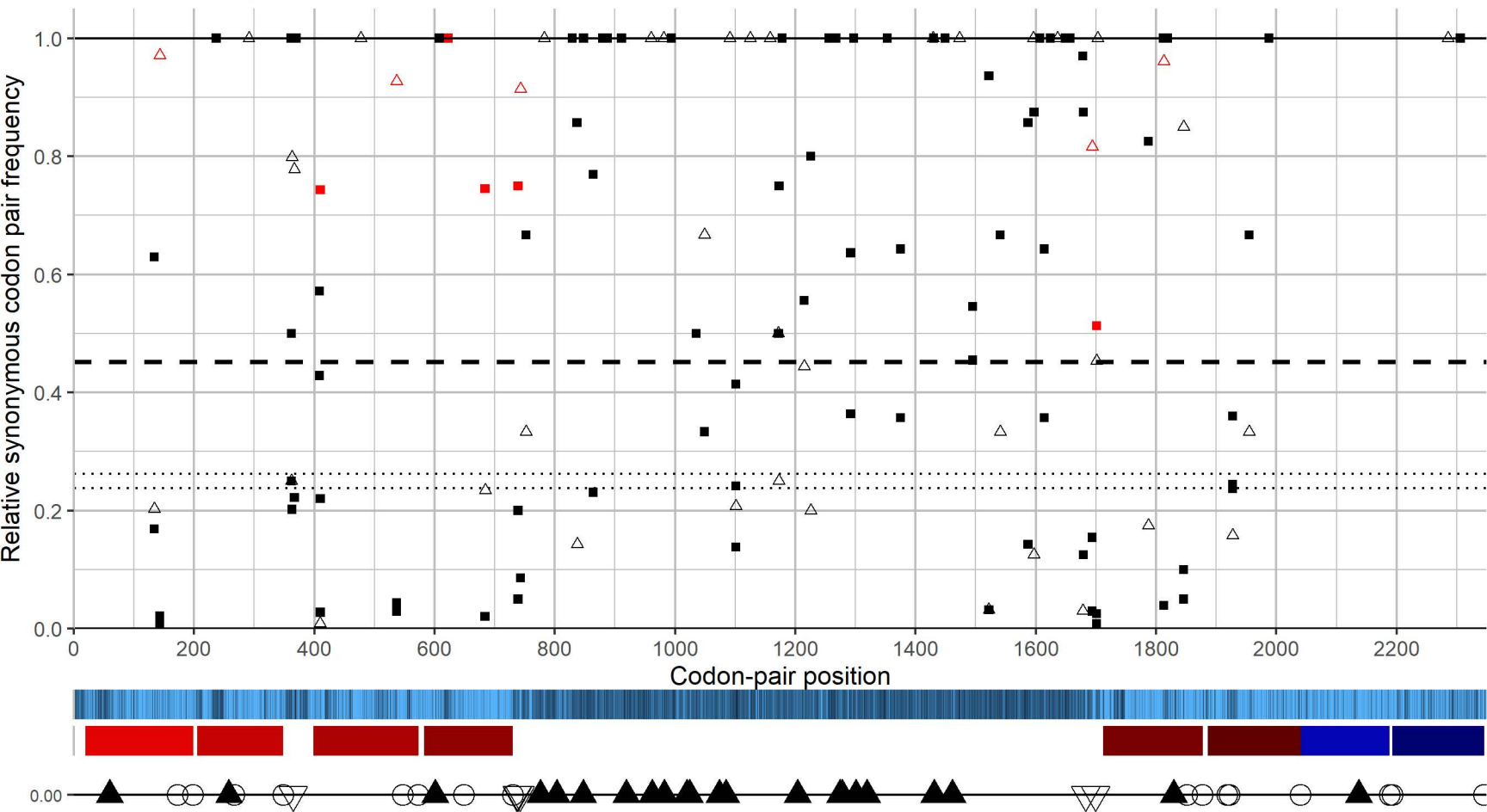
ADAMTS13 Position-specific RSCPF for Amino Acid Pair ACACAG (TQ) - Quartile 50-75%

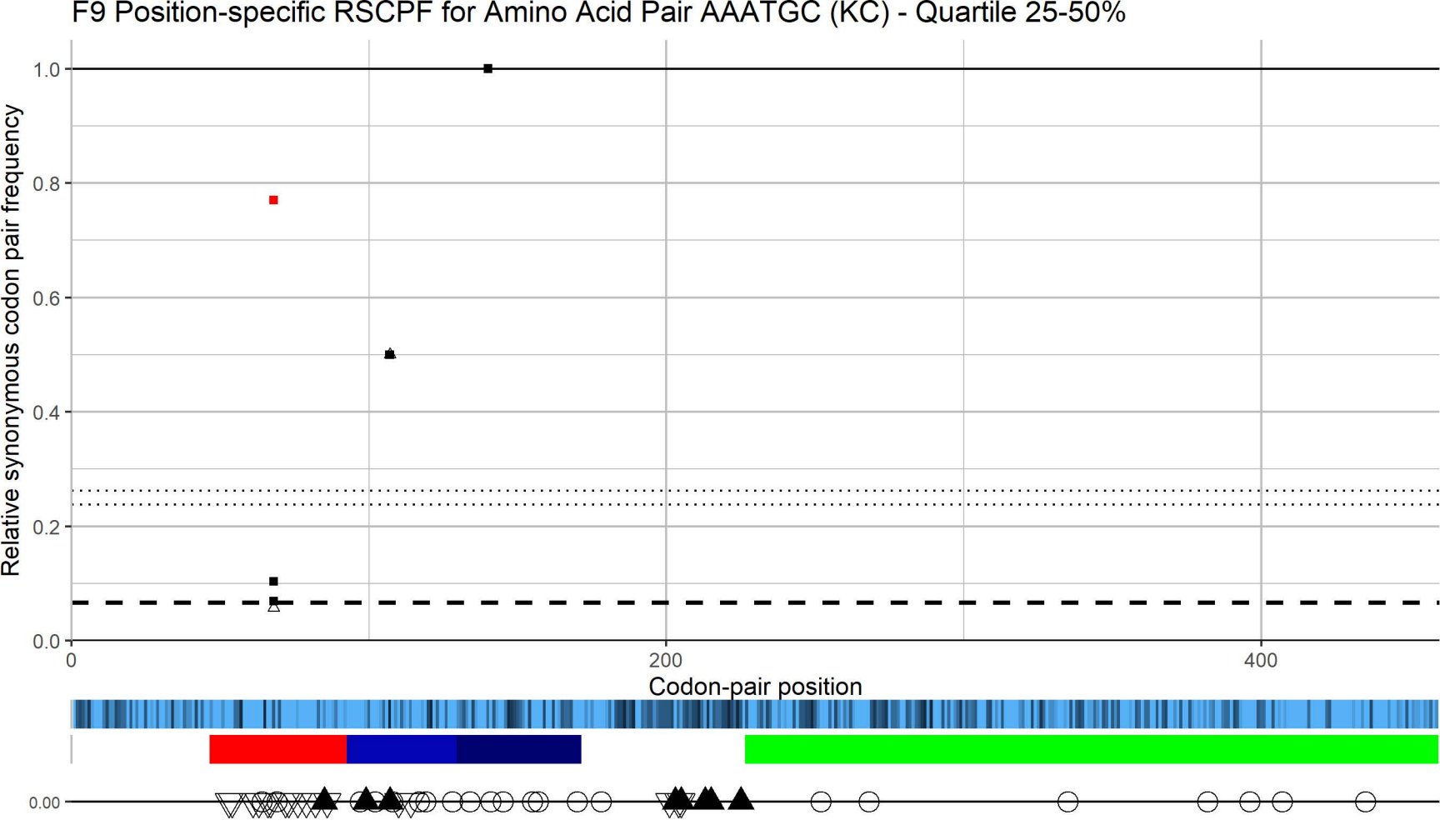


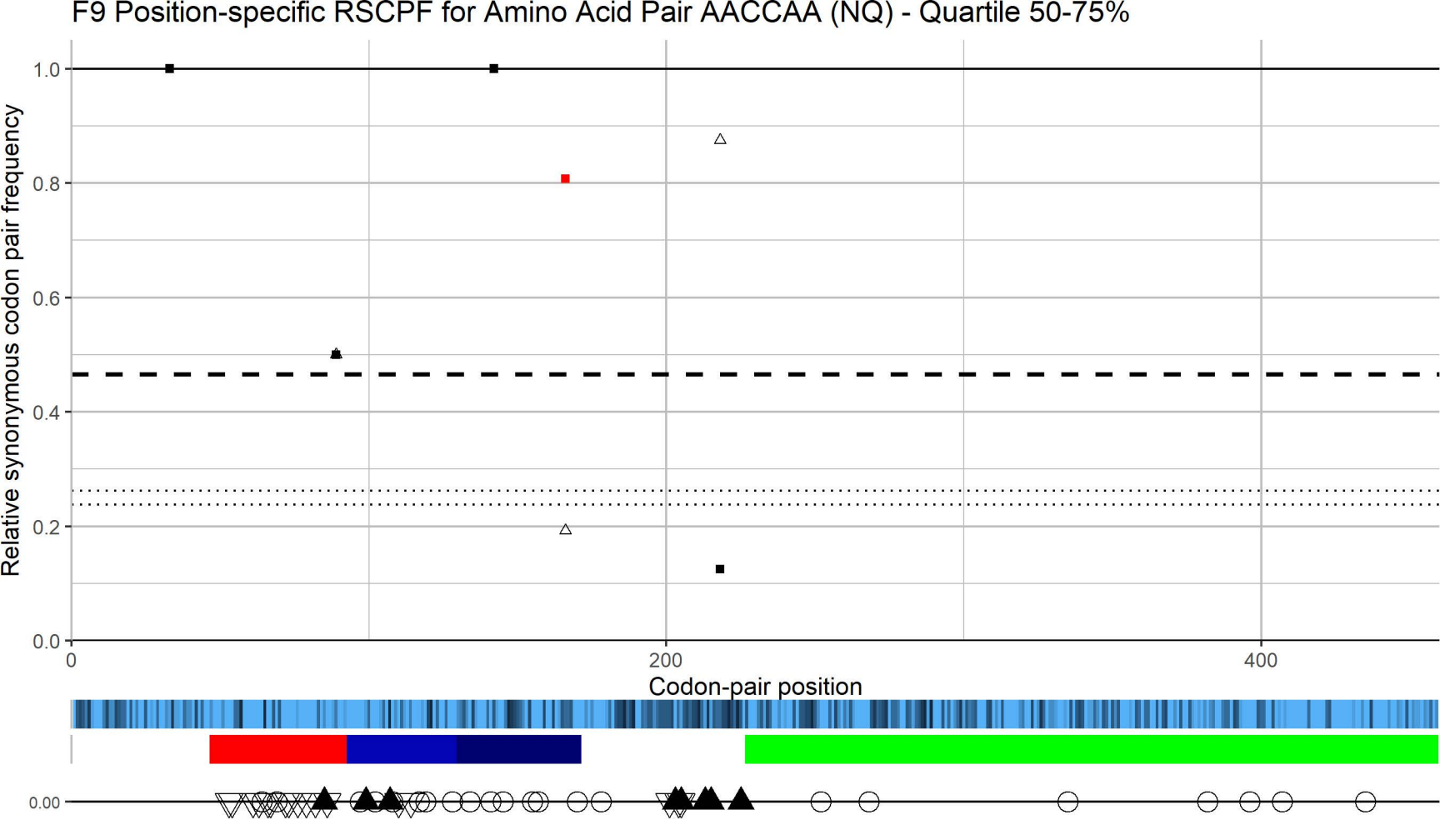




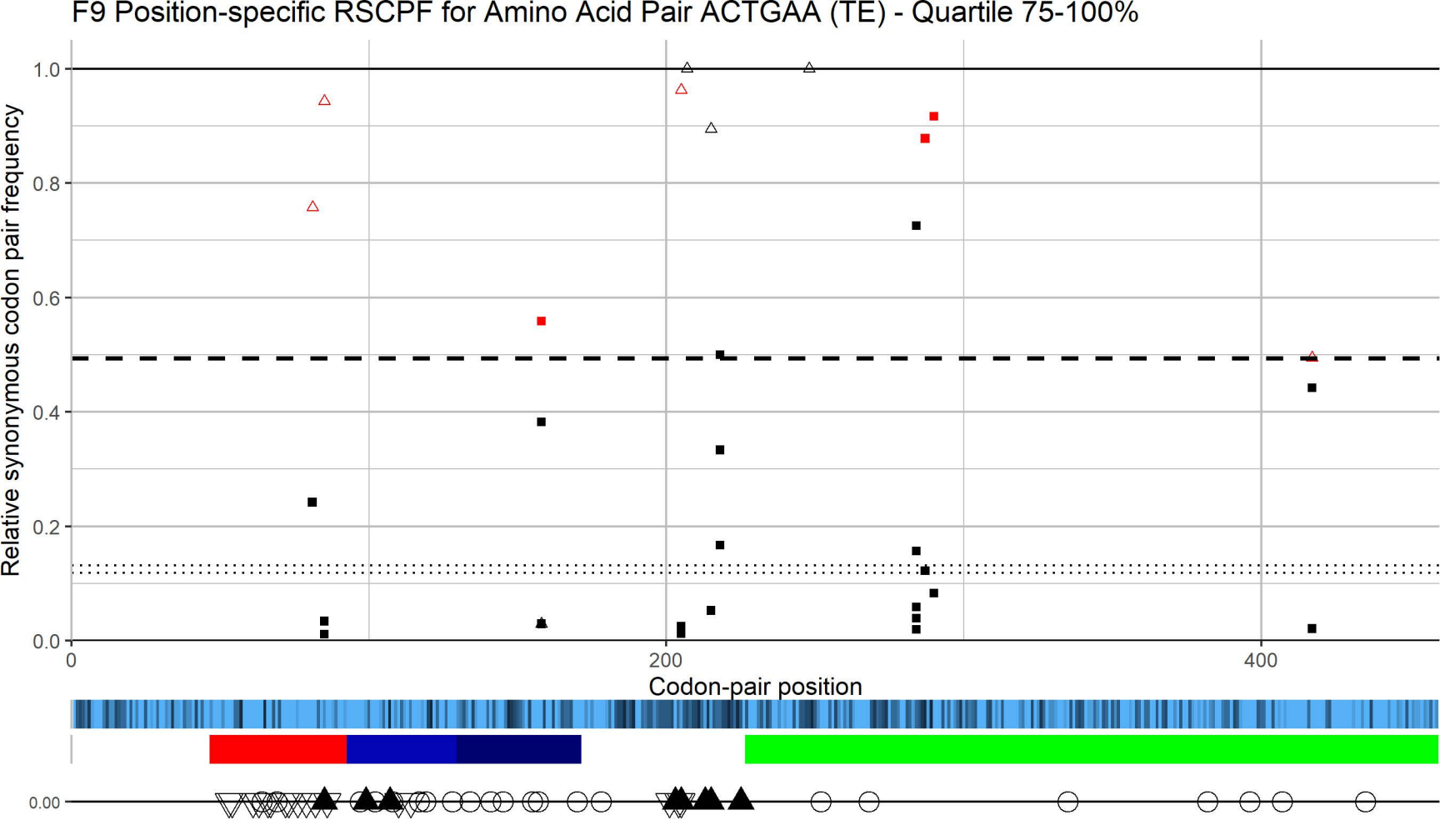
F8 Position-specific RSCPF for Amino Acid Pair GAAGAT (ED) - Quartile 75-100%

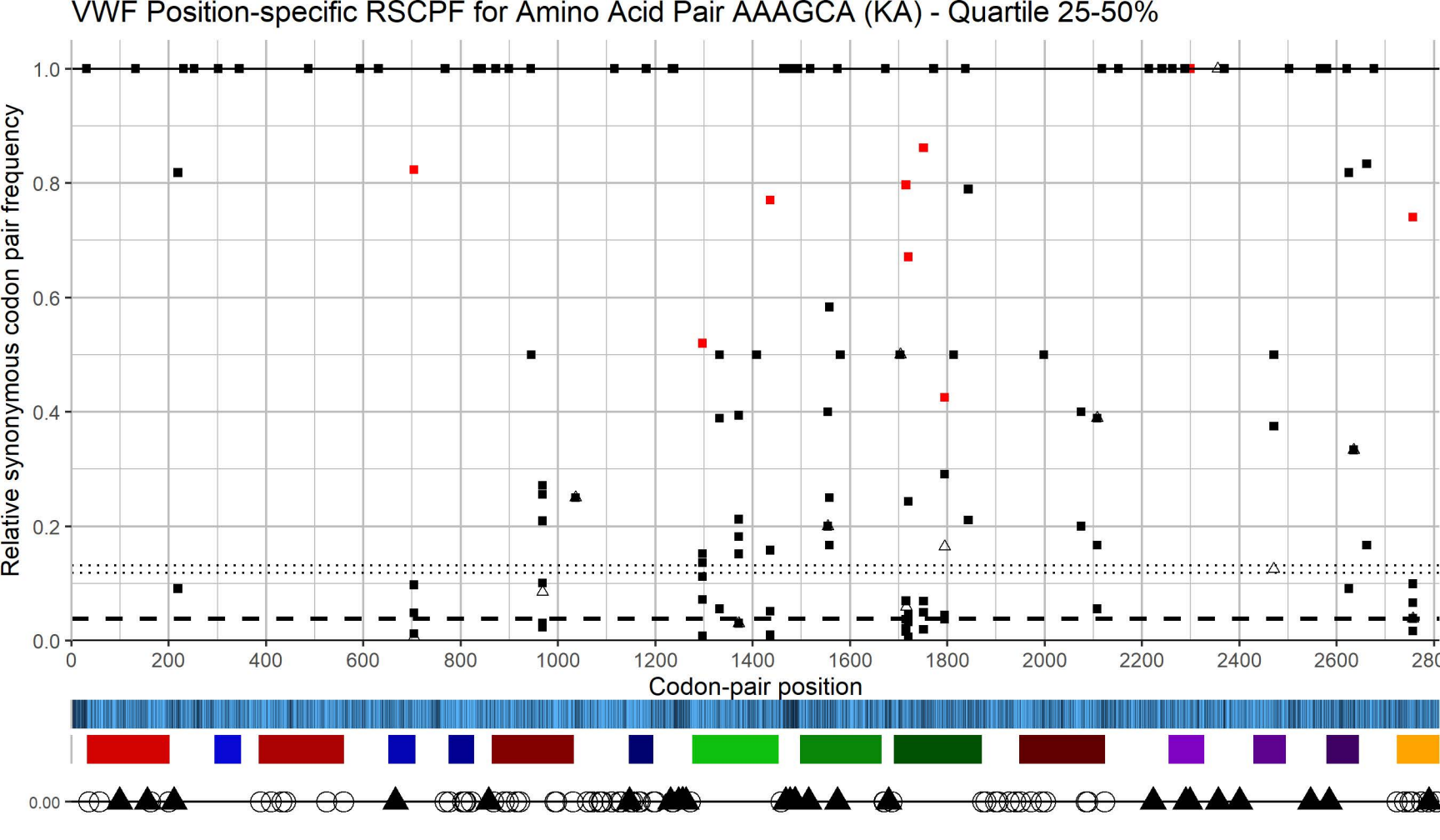




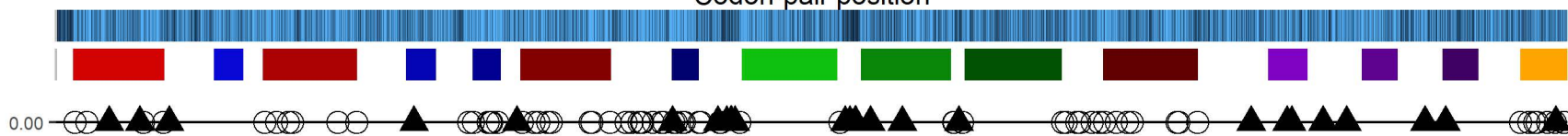
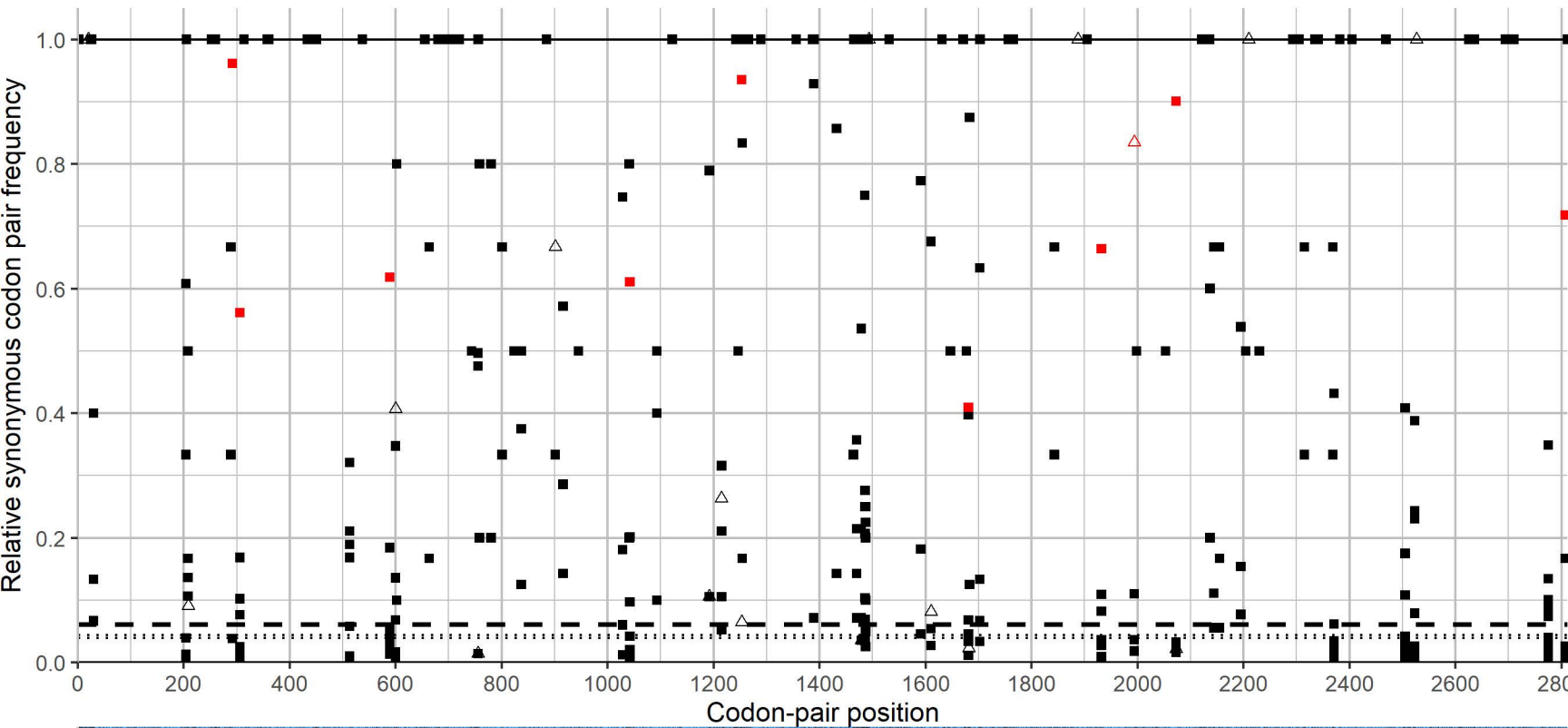








VWF Position-specific RSCPF for Amino Acid Pair AGCCCT (SP) - Quartile 50-75%



VWF Position-specific RSCPF for Amino Acid Pair TGCCAG (CQ) - Quartile 75-100%

