Supplementary Materials: Sequence Variability in Staphylococcal Enterotoxin Genes *seb*, *sec*, and *sed*

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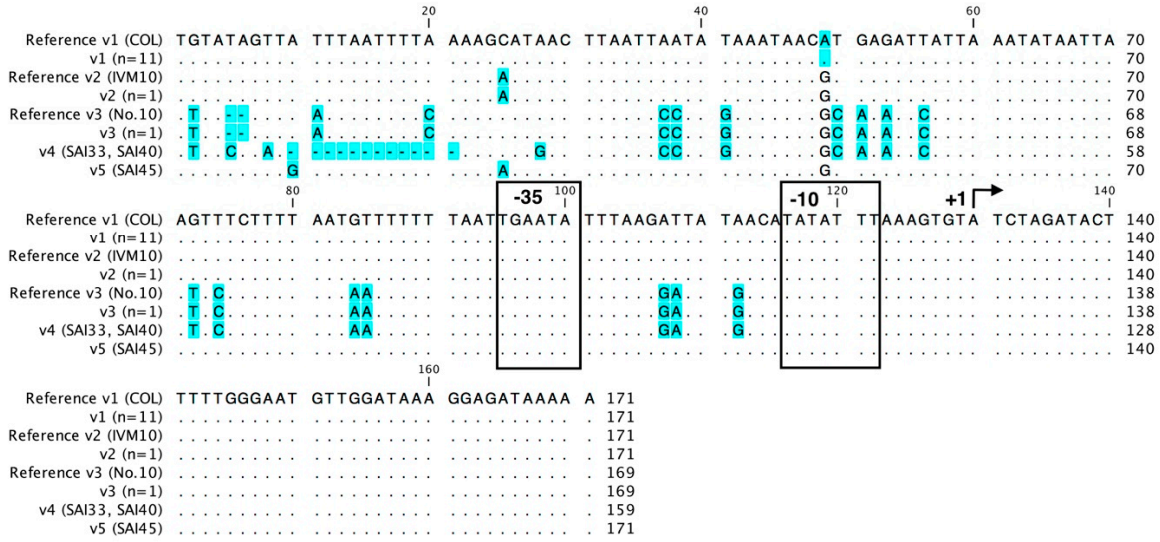
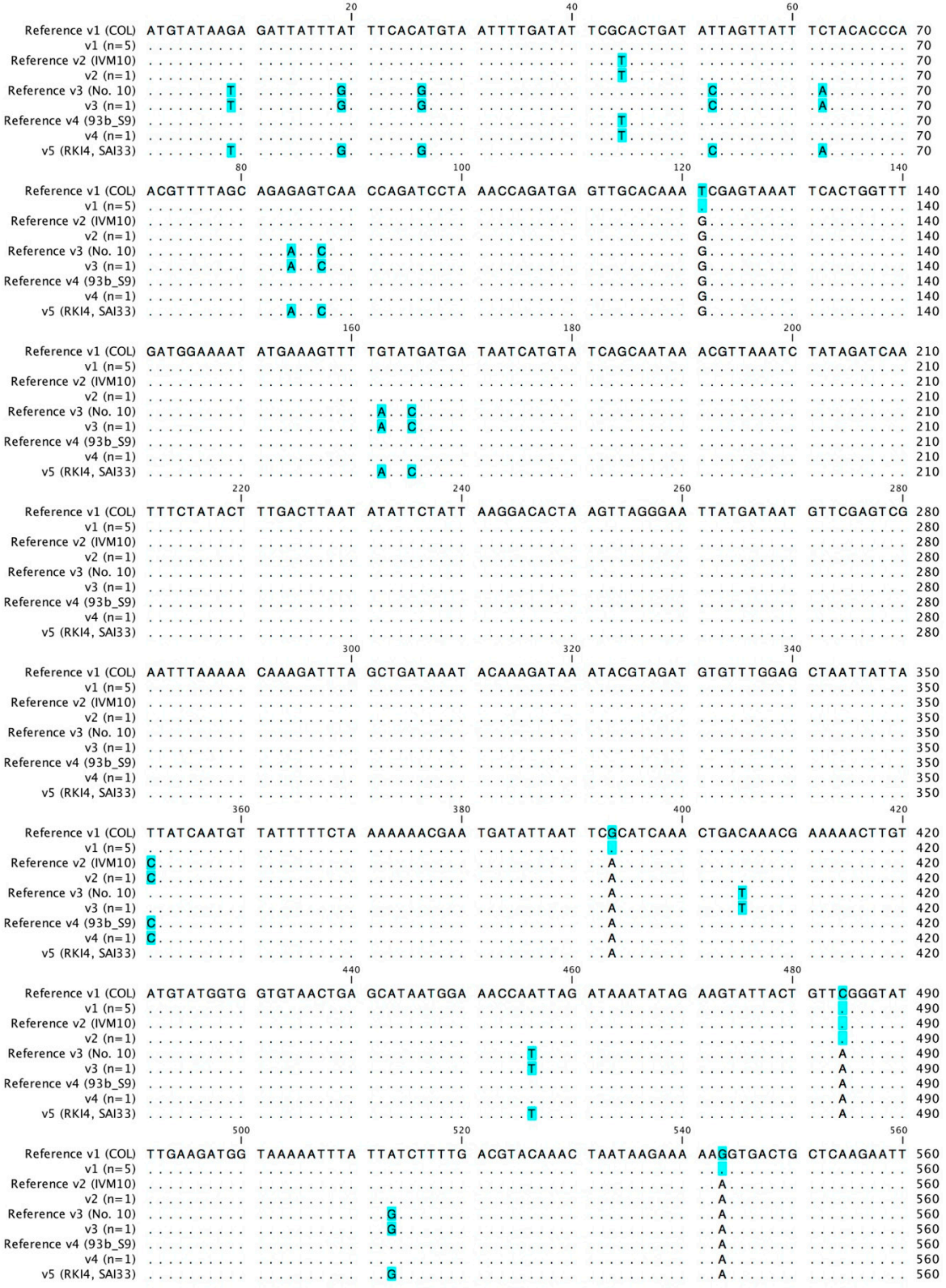
SEB PROMOTER



SEB GENE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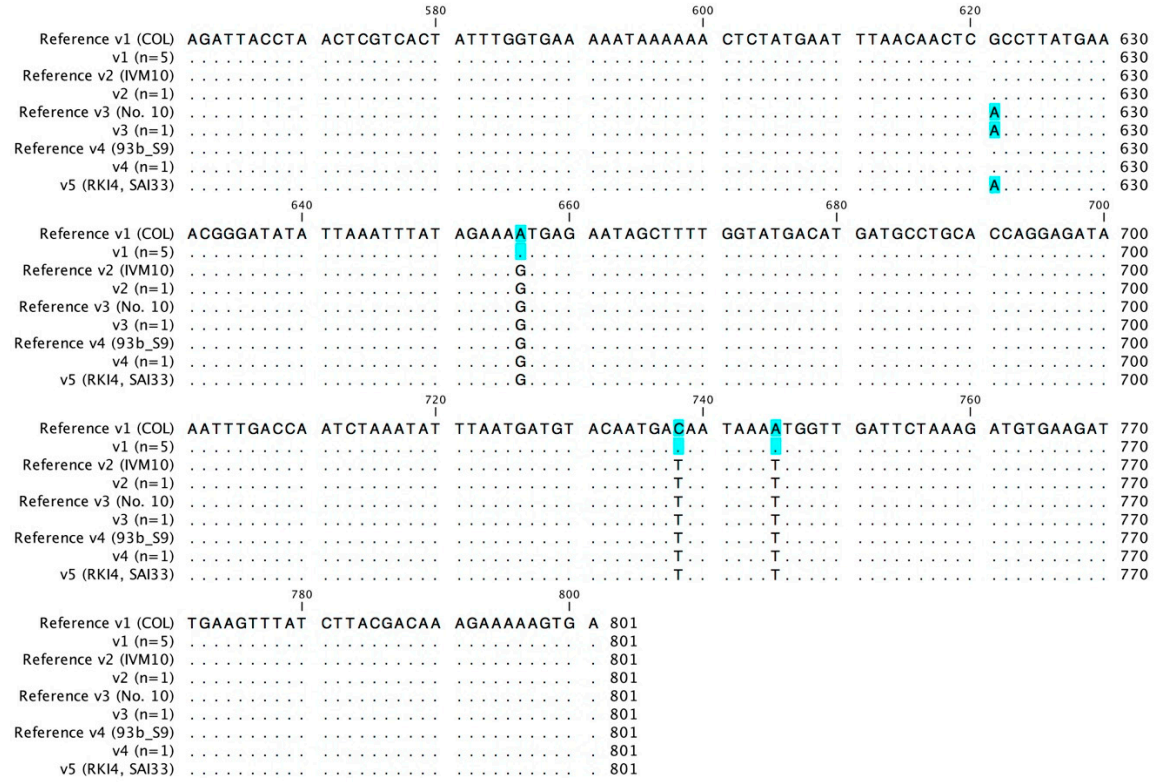
Reference v1 (COL) ATGTATAAGA GATTATTTAT TTCACATGTA ATTTTGATAT TCGCACTGAT ATTAGTTATT TCTACACCCA 70
v1 (n=5) 70
Reference v2 (IVM10) 70
v2 (n=1) 70
Reference v3 (No. 10) 70
v3 (n=1) 70
Reference v4 (93b_S9) 70
v4 (n=1) 70
v5 (RKI4, SAI33) 70
80 100 120 140
Reference v1 (COL) ACGTTTTAGC AGAGAGTCAA CCAGATCCTA AACCAGATGA GTTGCACAAA TCGAGTAAAT TCACTGGTTT 140
v1 (n=5) 140
Reference v2 (IVM10) 140
v2 (n=1) 140
Reference v3 (No. 10) 140
v3 (n=1) 140
Reference v4 (93b_S9) 140
v4 (n=1) 140
v5 (RKI4, SAI33) 140
160 180 200
Reference v1 (COL) GATGGAAAAT ATGAAAGTTT TGTATGATGA TAATCATGTA TCAGCAATAA ACGTTAAATC TATAGATCAA 210
v1 (n=5) 210
Reference v2 (IVM10) 210
v2 (n=1) 210
Reference v3 (No. 10) 210
v3 (n=1) 210
Reference v4 (93b_S9) 210
v4 (n=1) 210
v5 (RKI4, SAI33) 210
220 240 260 280
Reference v1 (COL) TTTCTATACT TTGACTTAAT ATATTCTATT AAGGACACTA AGTTAGGGAA TTATGATAAT GTTCGAGTCG 280
v1 (n=5) 280
Reference v2 (IVM10) 280
v2 (n=1) 280
Reference v3 (No. 10) 280
v3 (n=1) 280
Reference v4 (93b_S9) 280
v4 (n=1) 280
v5 (RKI4, SAI33) 280
300 320 340
Reference v1 (COL) AATTTAAAAA CAAAGATTTA GCTGATAAAT ACAAAGATAA ATACGTAGAT GTGTTTGGAG CTAATTATTA 350
v1 (n=5) 350
Reference v2 (IVM10) 350
v2 (n=1) 350
Reference v3 (No. 10) 350
v3 (n=1) 350
Reference v4 (93b_S9) 350
v4 (n=1) 350
v5 (RKI4, SAI33) 350
360 380 400 420
Reference v1 (COL) TTATCAATGT TATTTTTCTA AAAAAACGAA TGATATTAAT TCGCATCAAA CTGACAAACG AAAAACTTGT 420
v1 (n=5) 420
Reference v2 (IVM10) 420
v2 (n=1) 420
Reference v3 (No. 10) 420
v3 (n=1) 420
Reference v4 (93b_S9) 420
v4 (n=1) 420
v5 (RKI4, SAI33) 420
440 460 480
Reference v1 (COL) ATGTATGGTG GTGTAACTGA GCATAATGGA AACCAATTAG ATAAATATAG AAGTATTACT GTTCGGGTAT 490
v1 (n=5) 490
Reference v2 (IVM10) 490
v2 (n=1) 490
Reference v3 (No. 10) 490
v3 (n=1) 490
Reference v4 (93b_S9) 490
v4 (n=1) 490
v5 (RKI4, SAI33) 490
500 520 540 560
Reference v1 (COL) TTGAAGATGG TAAAAATTTA TTATCTTTTG ACGTACAAAC TAATAAGAAA AAGGTGACTG CTCAAGAATT 560
v1 (n=5) 560
Reference v2 (IVM10) 560
v2 (n=1) 560
Reference v3 (No. 10) 560
v3 (n=1) 560
Reference v4 (93b_S9) 560
v4 (n=1) 560
v5 (RKI4, SAI33) 560



SEB AMINO ACID

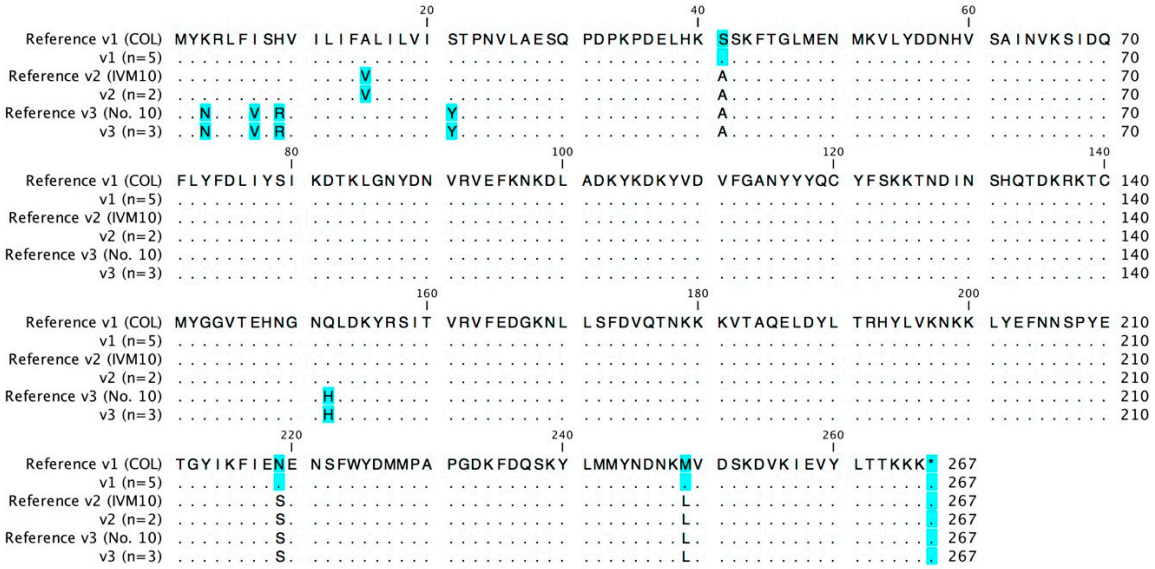
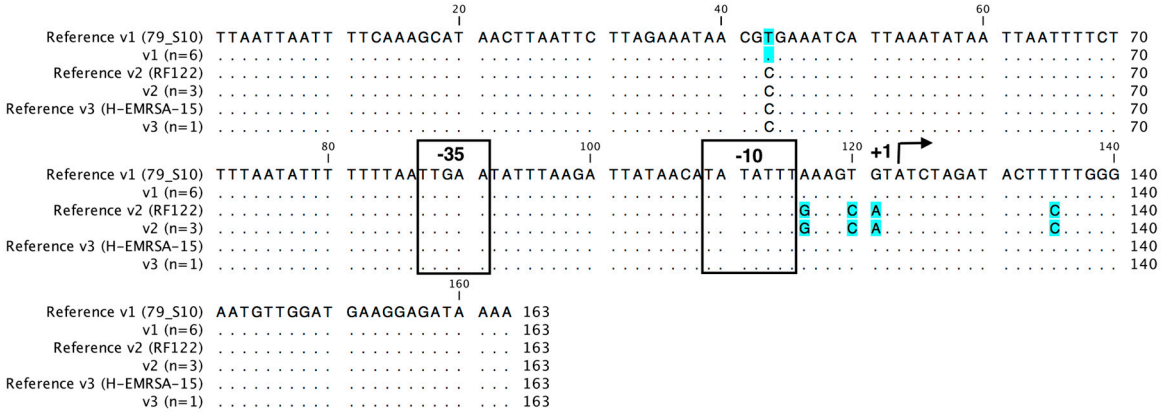
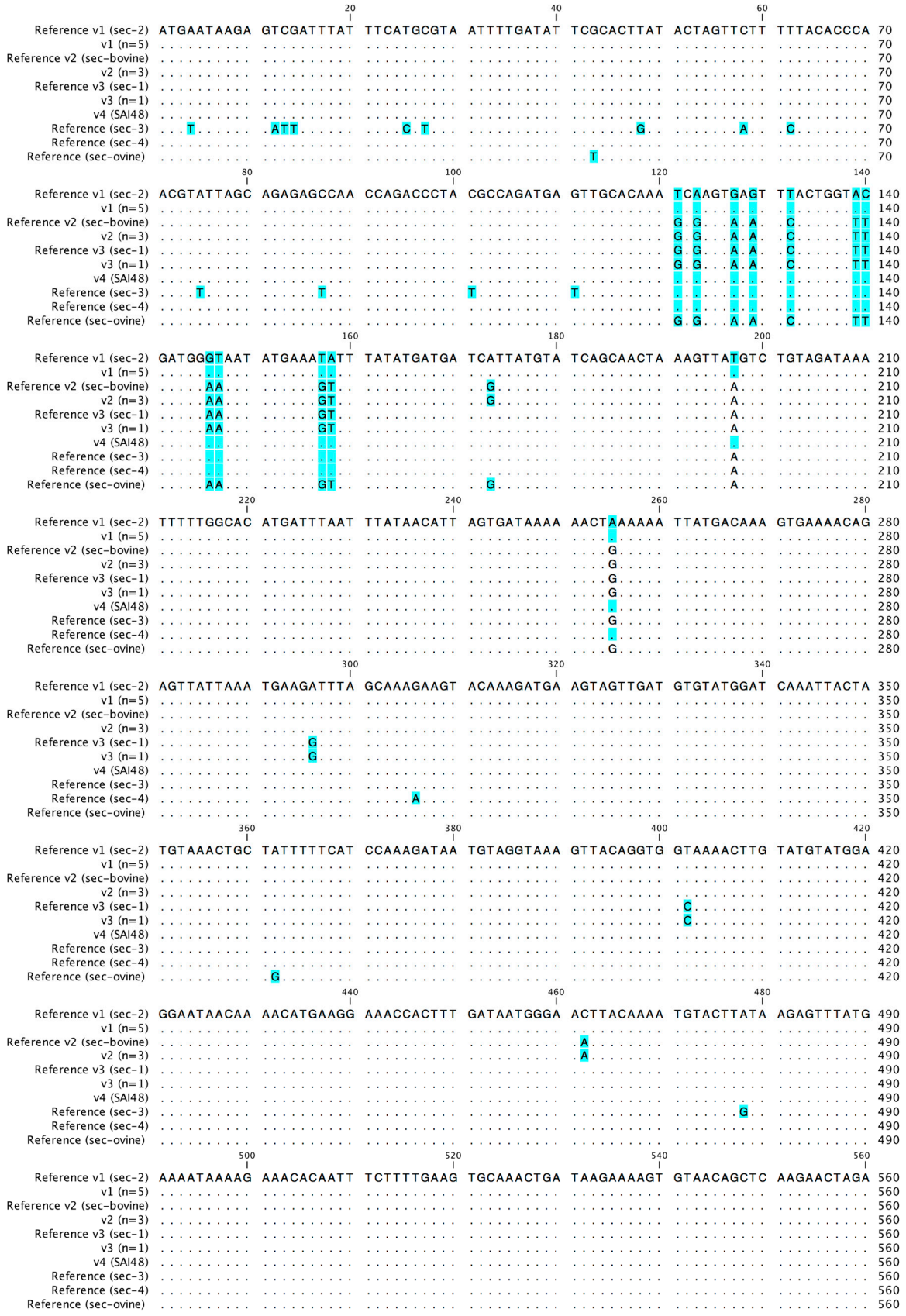


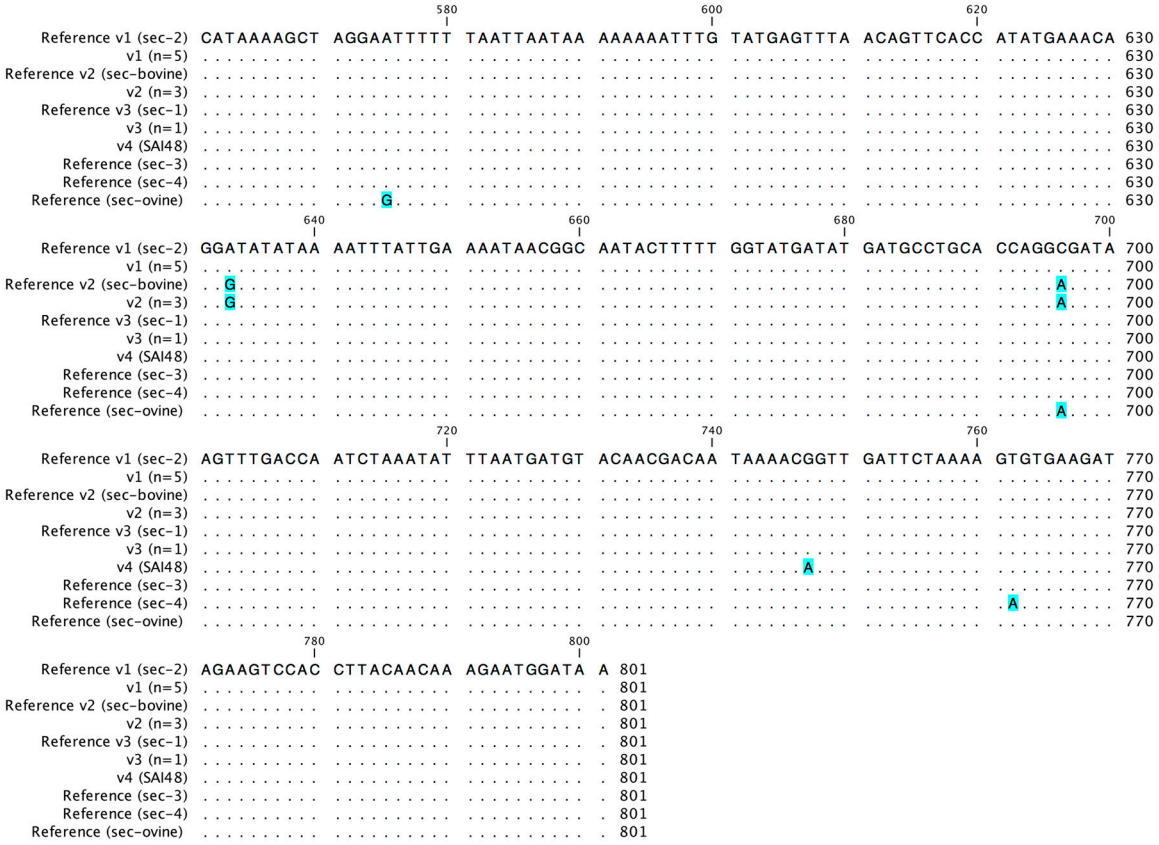
Figure S1. Sequence alignments for *seb*.

SEC PROMOTER



SEC GENE


20 40 60
Reference v1 (sec-2) ATGAATAAGA GTCGATTTAT TTCATGCGTA ATTTTGATAT TCGCACTTAT ACTAGTTCTT TTTACACCCA 70
v1 (n=5) 70
Reference v2 (sec-bovine) 70
v2 (n=3) 70
Reference v3 (sec-1) 70
v3 (n=1) 70
v4 (SAI48) 70
Reference (sec-3) 70
Reference (sec-4) 70
Reference (sec-ovine) 70
80 100 120 140
Reference v1 (sec-2) ACGTATTAGC AGAGAGCCAA CCAGACCCTA CGCCAGATGA GTTGCACAAA TCAAGTGAGT TTACTGGTAC 140
v1 (n=5) 140
Reference v2 (sec-bovine) 140
v2 (n=3) 140
Reference v3 (sec-1) 140
v3 (n=1) 140
v4 (SAI48) 140
Reference (sec-3) 140
Reference (sec-4) 140
Reference (sec-ovine) 140
160 180 200
Reference v1 (sec-2) GATGGGTAAT ATGAAATATT TATATGATGA TCATTATGTA TCAGCAACTA AAGTTATGTC TGTAGATAAA 210
v1 (n=5) 210
Reference v2 (sec-bovine) 210
v2 (n=3) 210
Reference v3 (sec-1) 210
v3 (n=1) 210
v4 (SAI48) 210
Reference (sec-3) 210
Reference (sec-4) 210
Reference (sec-ovine) 210
220 240 260 280
Reference v1 (sec-2) TTTTTGGCAC ATGATTTAAT TTATAACATT AGTGATAAAA AACTAAAAAA TTATGACAAA GTGAAAACAG 280
v1 (n=5) 280
Reference v2 (sec-bovine) 280
v2 (n=3) 280
Reference v3 (sec-1) 280
v3 (n=1) 280
v4 (SAI48) 280
Reference (sec-3) 280
Reference (sec-4) 280
Reference (sec-ovine) 280
300 320 340
Reference v1 (sec-2) AGTTATTAAA TGAAGATTTA GCAAAGAAGT ACAAAGATGA AGTAGTTGAT GTGTATGGAT CAAATTACTA 350
v1 (n=5) 350
Reference v2 (sec-bovine) 350
v2 (n=3) 350
Reference v3 (sec-1) 350
v3 (n=1) 350
v4 (SAI48) 350
Reference (sec-3) 350
Reference (sec-4) 350
Reference (sec-ovine) 350
360 380 400 420
Reference v1 (sec-2) TGTAAACTGC TATTTTTCAT CCAAAGATAA TGTAGGTAAA GTTACAGGTG GTAAAACTTG TATGTATGGA 420
v1 (n=5) 420
Reference v2 (sec-bovine) 420
v2 (n=3) 420
Reference v3 (sec-1) 420
v3 (n=1) 420
v4 (SAI48) 420
Reference (sec-3) 420
Reference (sec-4) 420
Reference (sec-ovine) 420
440 460 480
Reference v1 (sec-2) GGAATAACAA AACATGAAGG AAACCACTTT GATAATGGGA ACTTACAAAA TGTACTTATA AGAGTTTATG 490
v1 (n=5) 490
Reference v2 (sec-bovine) 490
v2 (n=3) 490
Reference v3 (sec-1) 490
v3 (n=1) 490
v4 (SAI48) 490
Reference (sec-3) 490
Reference (sec-4) 490
Reference (sec-ovine) 490
500 520 540 560
Reference v1 (sec-2) AAAATAAAAG AAACACAATT TCTTTTGAAG TGCAAACTGA TAAGAAAAGT GTAACAGCTC AAGAACTAGA 560
v1 (n=5) 560
Reference v2 (sec-bovine) 560
v2 (n=3) 560
Reference v3 (sec-1) 560
v3 (n=1) 560
v4 (SAI48) 560
Reference (sec-3) 560
Reference (sec-4) 560
Reference (sec-ovine) 560



SEC AMINO ACID

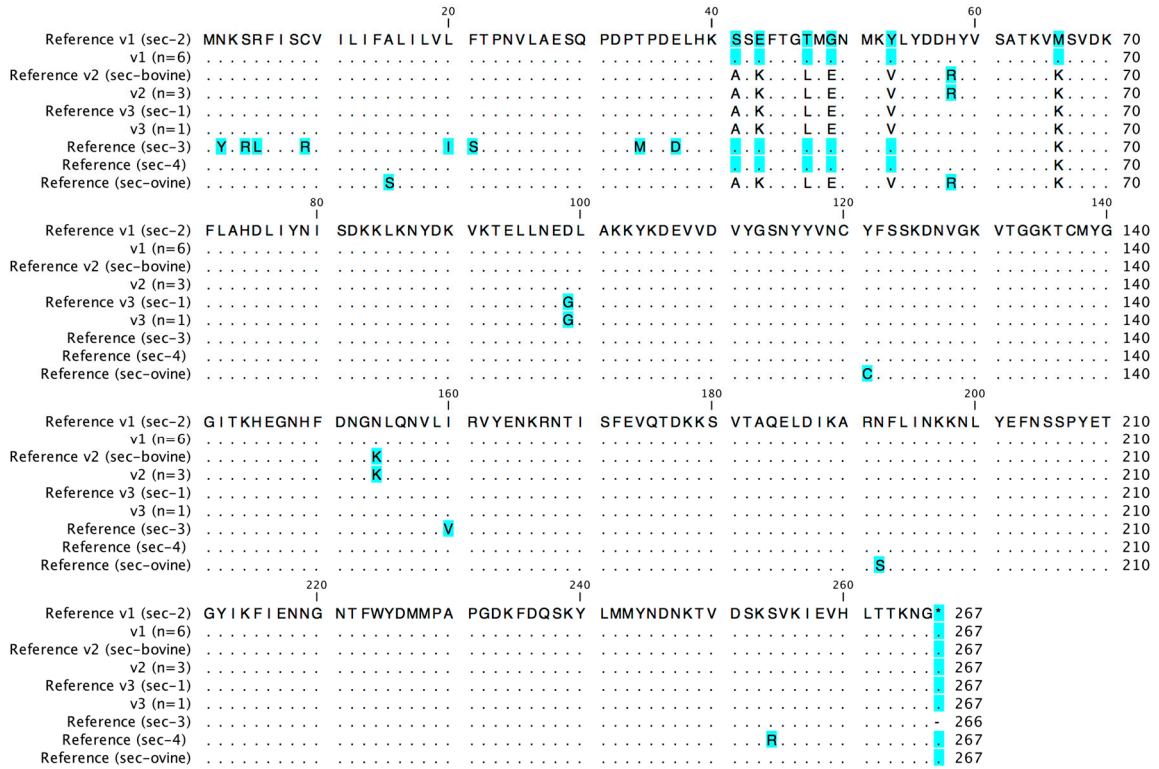
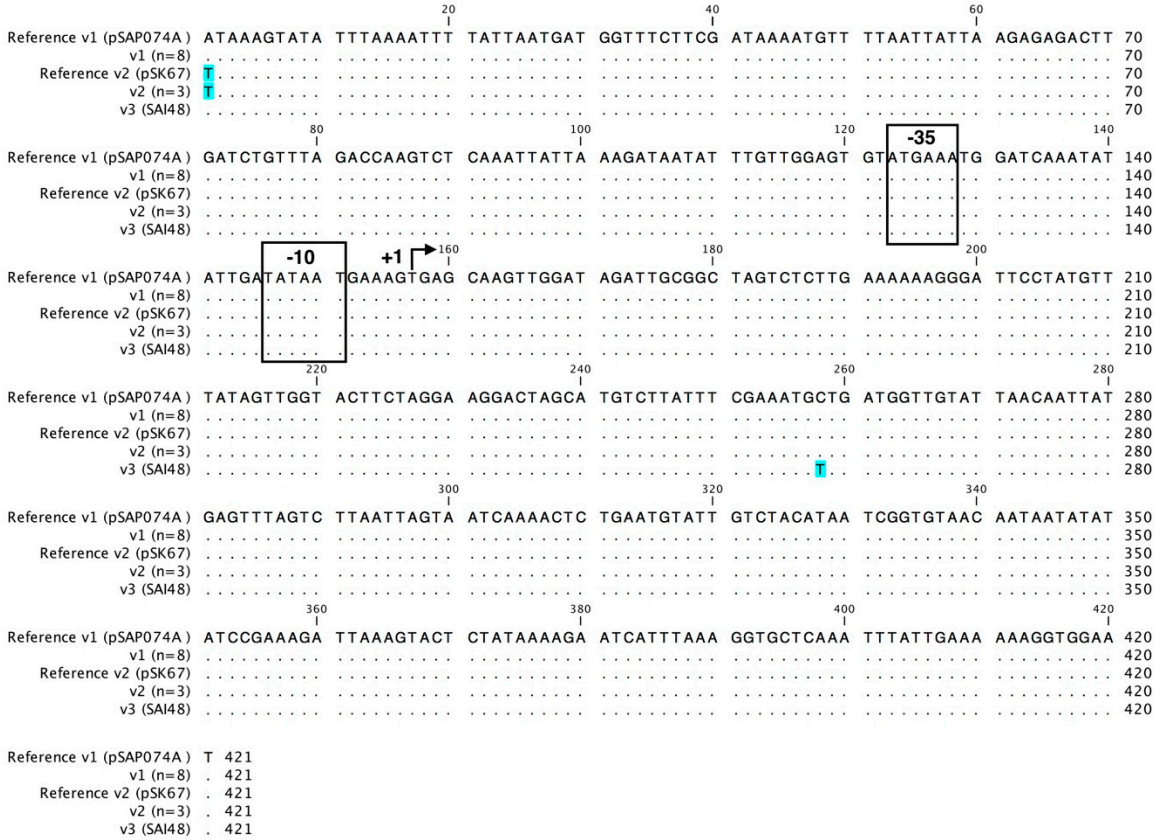
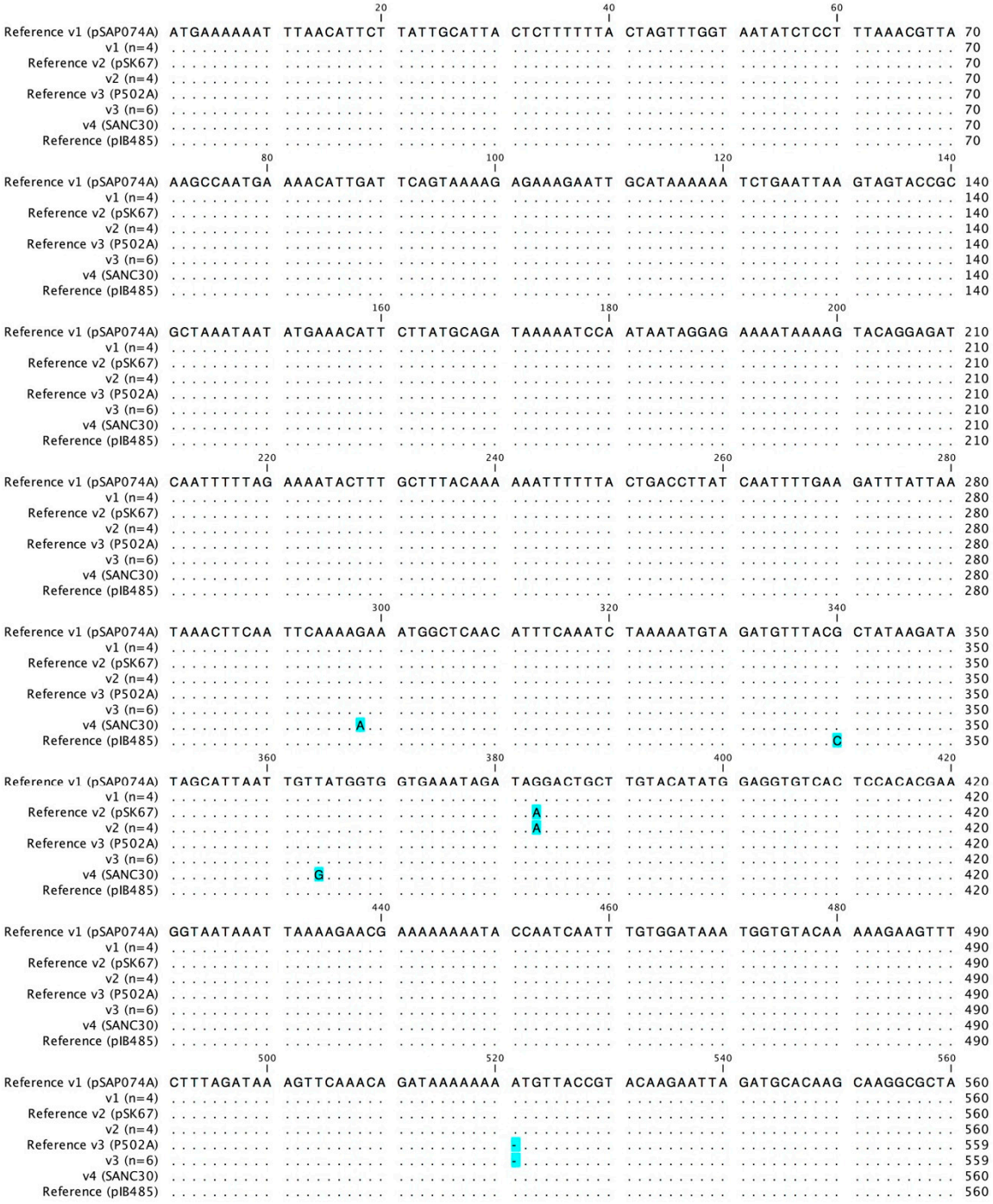


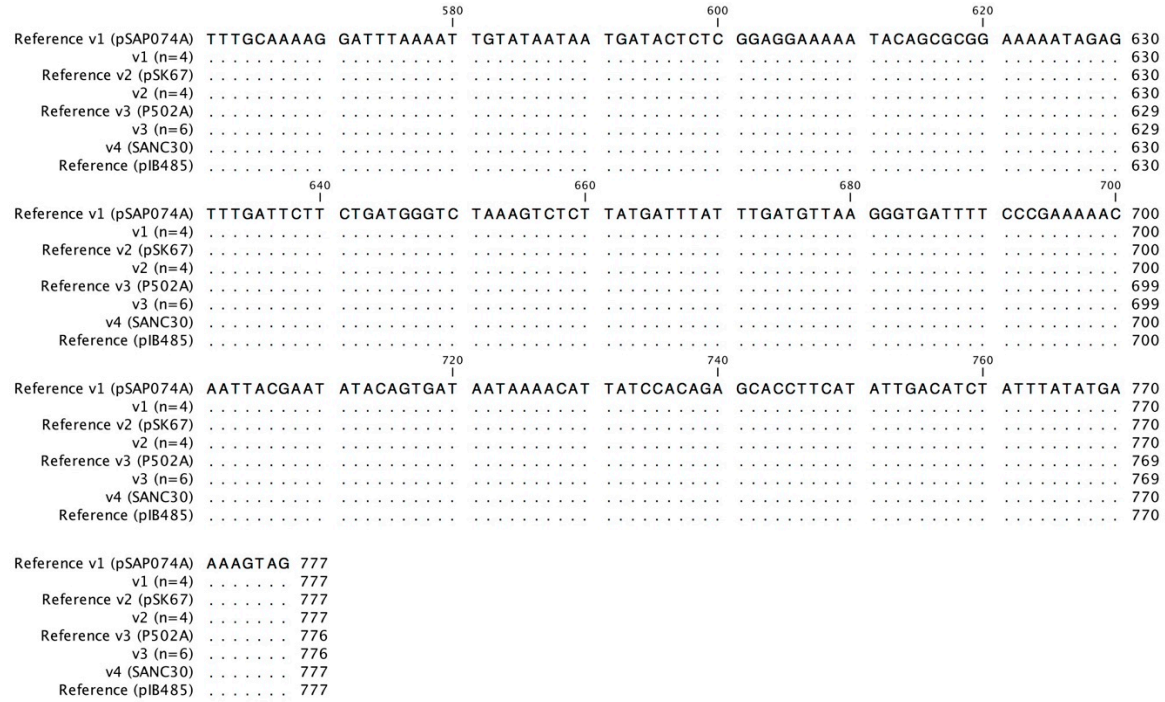
Figure S2. Sequence alignments for *sec*.

SED PROMOTER



SED GENE


20 40 60
Reference v1 (pSAP074A) ATGAAAAAAT TTAACATTCT TATTGCATTA CTCTTTTTTA CTAGTTTGGT AATATCTCCT TTAAACGTTA 70
v1 (n=4) 70
Reference v2 (pSK67) 70
v2 (n=4) 70
Reference v3 (P502A) 70
v3 (n=6) 70
v4 (SANC30) 70
Reference (pIB485) 70
80 100 120 140
Reference v1 (pSAP074A) AAGCCAATGA AAACATTGAT TCAGTAAAAG AGAAAGAATT GCATAAAAAA TCTGAATTAA GTAGTACCGC 140
v1 (n=4) 140
Reference v2 (pSK67) 140
v2 (n=4) 140
Reference v3 (P502A) 140
v3 (n=6) 140
v4 (SANC30) 140
Reference (pIB485) 140
160 180 200
Reference v1 (pSAP074A) GCTAAATAAT ATGAAACATT CTTATGCAGA TAAAAATCCA ATAATAGGAG AAAATAAAAG TACAGGAGAT 210
v1 (n=4) 210
Reference v2 (pSK67) 210
v2 (n=4) 210
Reference v3 (P502A) 210
v3 (n=6) 210
v4 (SANC30) 210
Reference (pIB485) 210
220 240 260 280
Reference v1 (pSAP074A) CAATTTTTAG AAAATACTTT GCTTTACAAA AAATTTTTTA CTGACCTTAT CAATTTTGAA GATTTATTAA 280
v1 (n=4) 280
Reference v2 (pSK67) 280
v2 (n=4) 280
Reference v3 (P502A) 280
v3 (n=6) 280
v4 (SANC30) 280
Reference (pIB485) 280
300 320 340
Reference v1 (pSAP074A) TAAACTTCAA TTCAAAAGAA ATGGCTCAAC ATTTCAAATC TAAAAATGTA GATGTTTACG CTATAAGATA 350
v1 (n=4) 350
Reference v2 (pSK67) 350
v2 (n=4) 350
Reference v3 (P502A) 350
v3 (n=6) 350
v4 (SANC30) 350
Reference (pIB485) 350
360 380 400 420
Reference v1 (pSAP074A) TAGCATTAAT TGTTATGGTG GTGAAATAGA TAGGACTGCT TGTACATATG GAGGTGTCAC TCCACACGAA 420
v1 (n=4) 420
Reference v2 (pSK67) 420
v2 (n=4) 420
Reference v3 (P502A) 420
v3 (n=6) 420
v4 (SANC30) 420
Reference (pIB485) 420
440 460 480
Reference v1 (pSAP074A) GGTAATAAAT TAAAAGAACG AAAAAAAATA CCAATCAATT TGTGGATAAA TGGTGTACAA AAAGAAGTTT 490
v1 (n=4) 490
Reference v2 (pSK67) 490
v2 (n=4) 490
Reference v3 (P502A) 490
v3 (n=6) 490
v4 (SANC30) 490
Reference (pIB485) 490
500 520 540 560
Reference v1 (pSAP074A) CTTTAGATAA AGTTCAAACA GATAAAAAAA ATGTTACCGT ACAAGAATTA GATGCACAAG CAAGGCGCTA 560
v1 (n=4) 560
Reference v2 (pSK67) 560
v2 (n=4) 560
Reference v3 (P502A) 559
v3 (n=6) 559
v4 (SANC30) 560
Reference (pIB485) 560



SED AMINO ACID

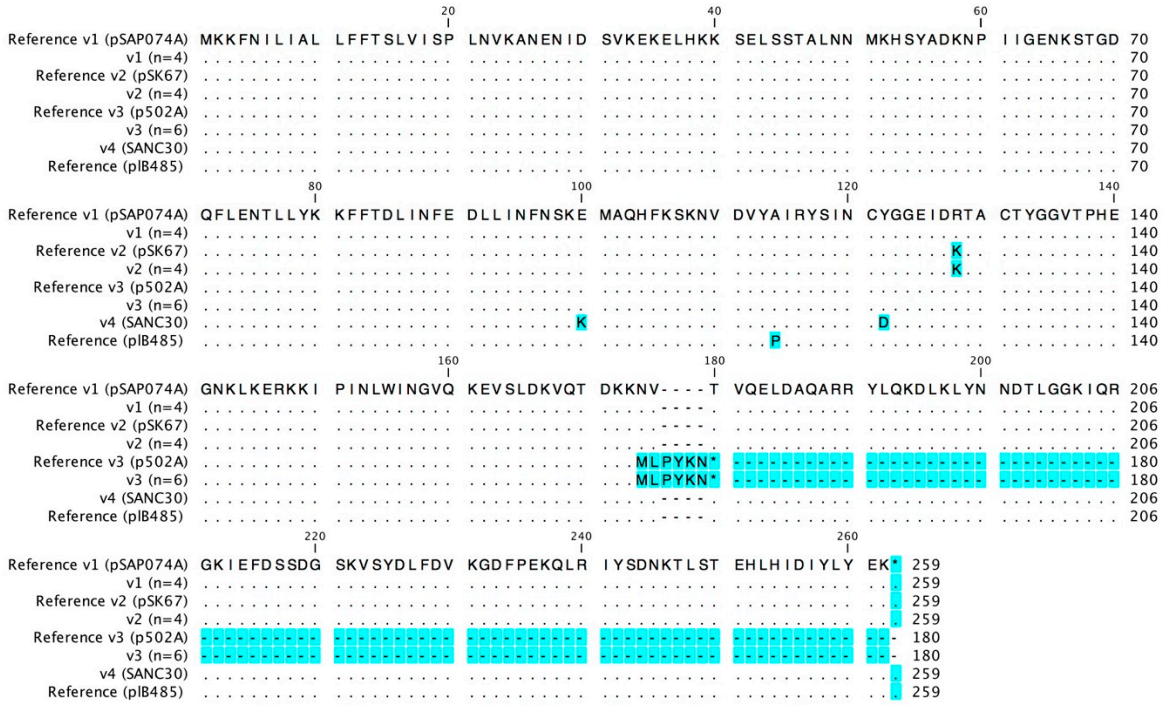


Figure S3. Sequence alignments for *sed*.

Table S1. Primers used in this study.

Target	Primer ID	Primer Sequence (5′–3′)	Annealing Temperature (°C)
seb promoter	seb_p_fwd	TGAGGAGATTGAAGCAACGC	56
	seb_p_rev	AGGCAGGTACTCTATAAGTGCC	
seb	seb_fwd	TGATGATAATCATGTATCAGCA	61
	seb_rev	ACGGCGACACAGTAACTATCCA	
sec promoter	sec_p_fwd	TCAAGATGCTTAGAAATCCTCTGT	66
	sec_p_rev	AGCTTTCTGGAAGACCGTATCCTGT	
sec	sec_fwd	TCAAGATGCTTAGAAATCCTCTGT	63
	sec_rev	TCGGTGCTTGCCTTTTTAGGA	
sed promoter	sed_p_fwd	ATCCGGCTGTTCCTATGGCACC	56
	sed_p_rev	AGATGCACAAGCAAGGCGCT	
sed	sed_fwd	TTCGAAATGCTGATGGTTGT	62
	sed_rev	AGCTATCATCAATTTCTTTTCAAGC	