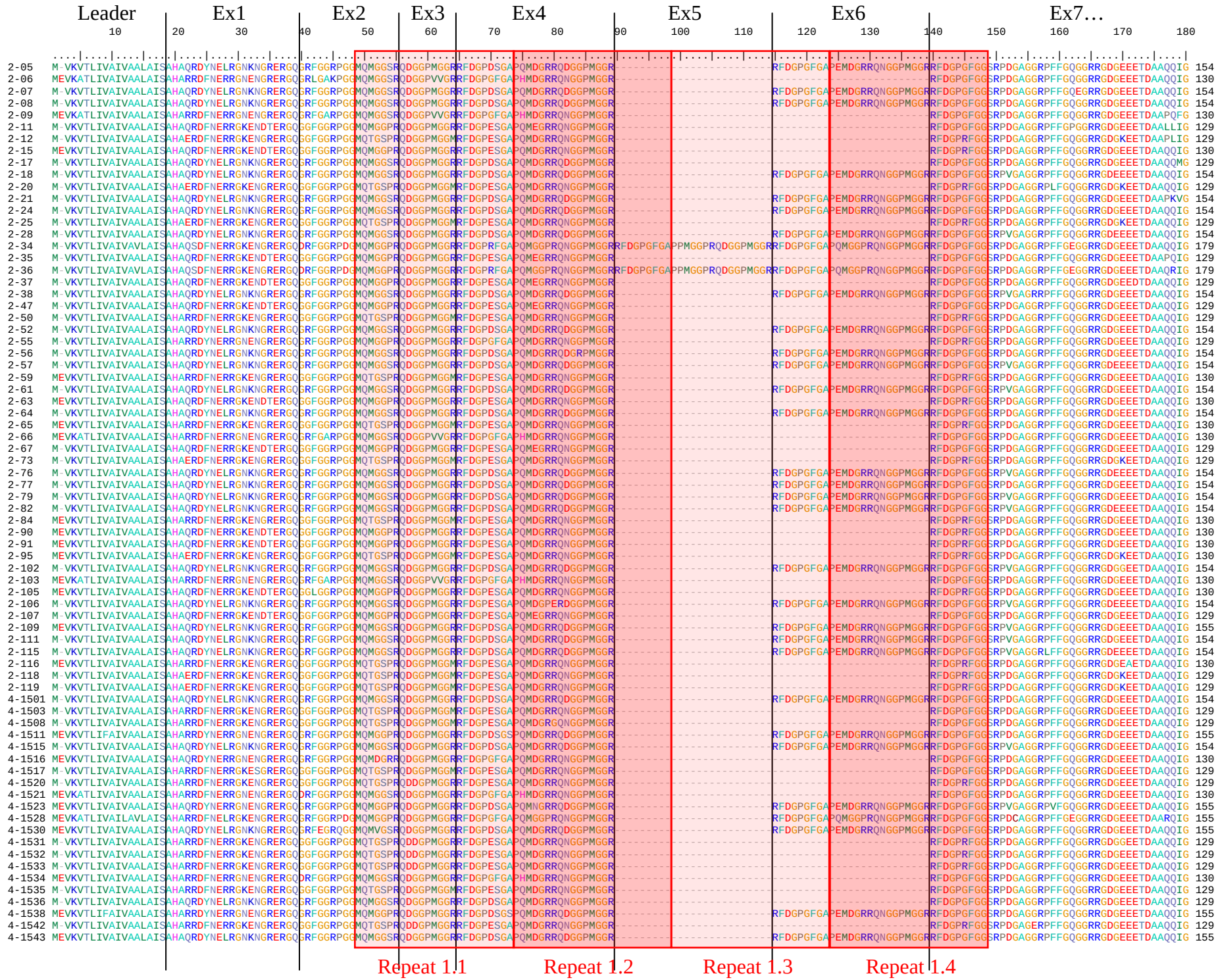
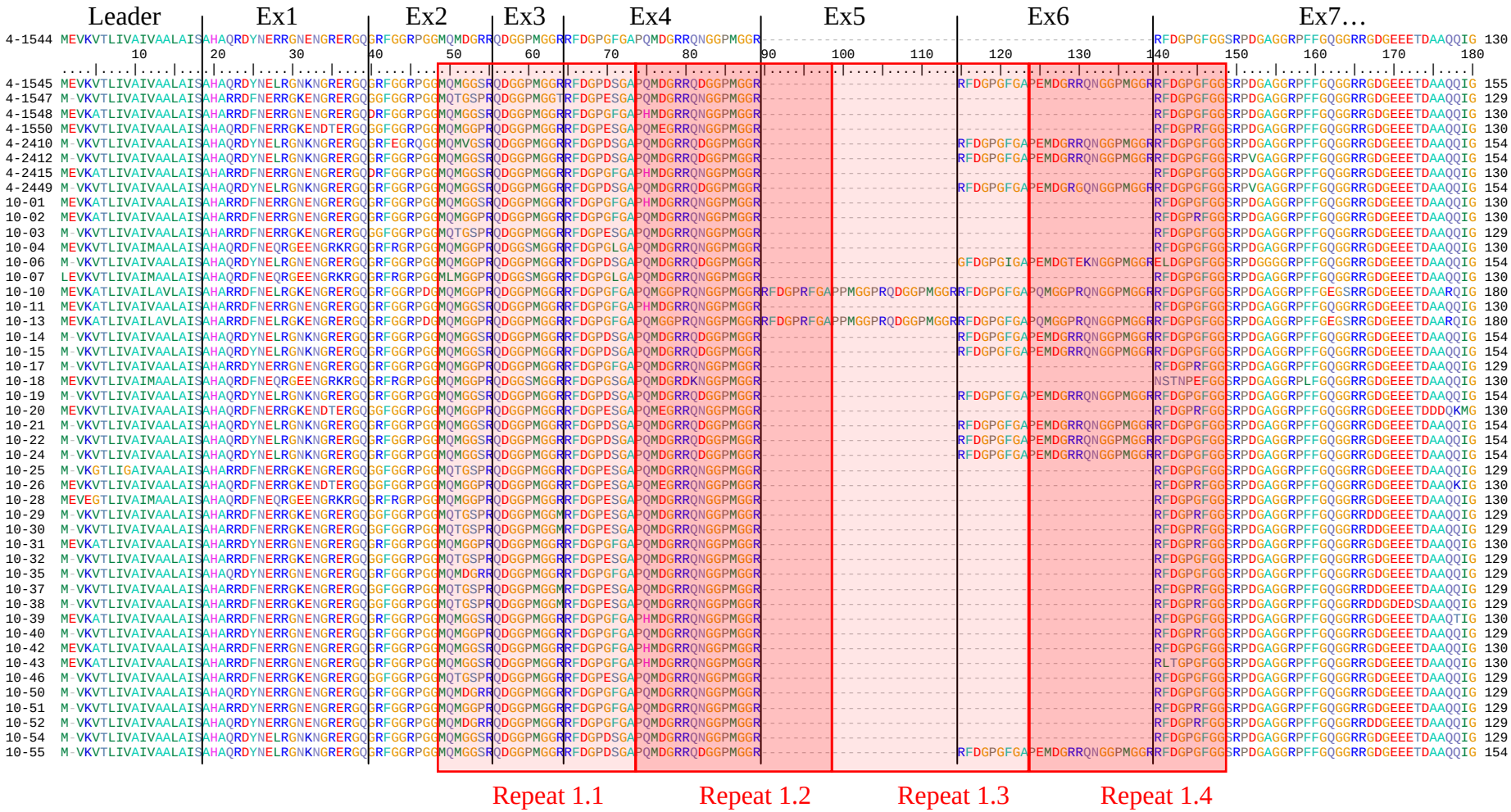
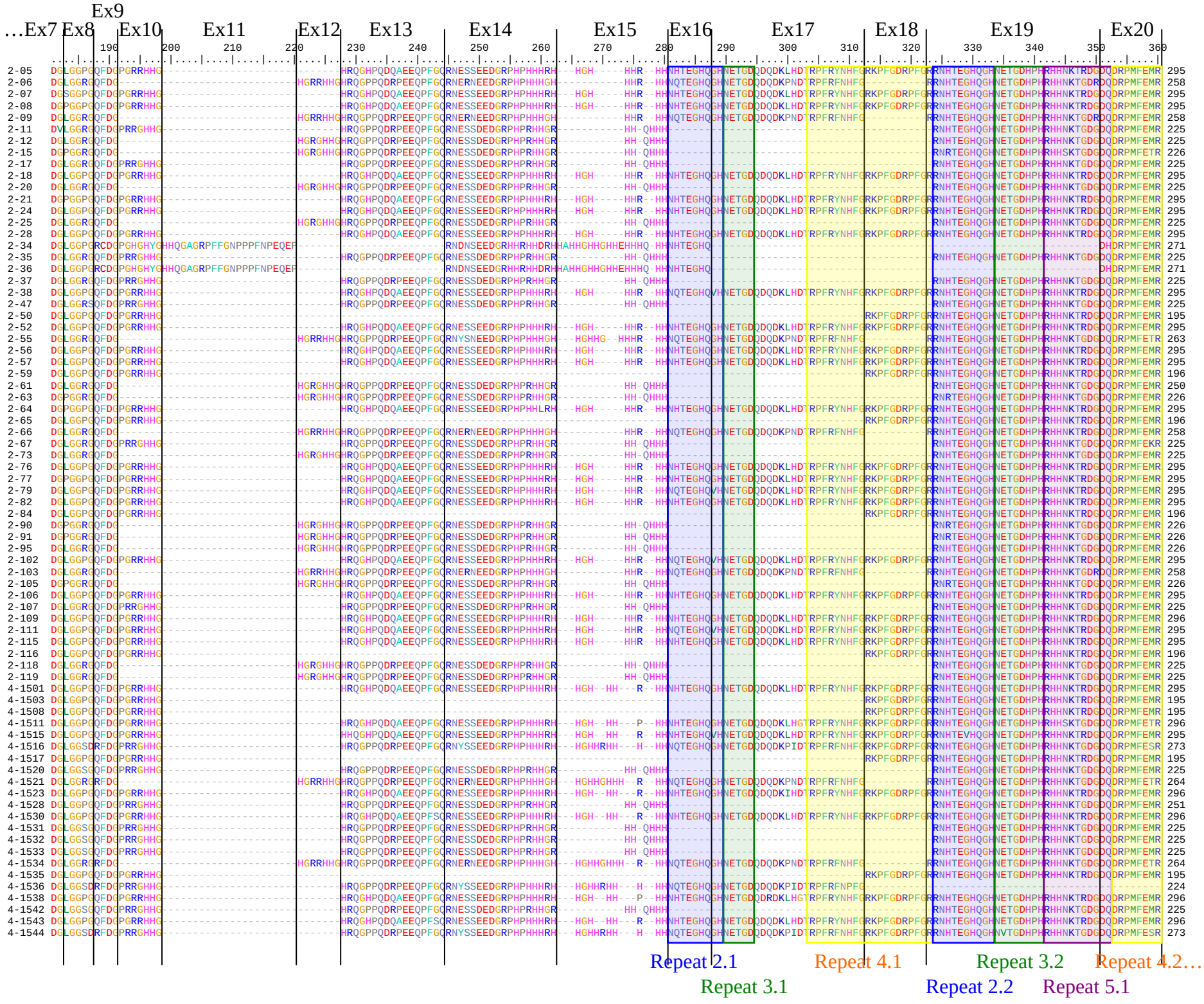
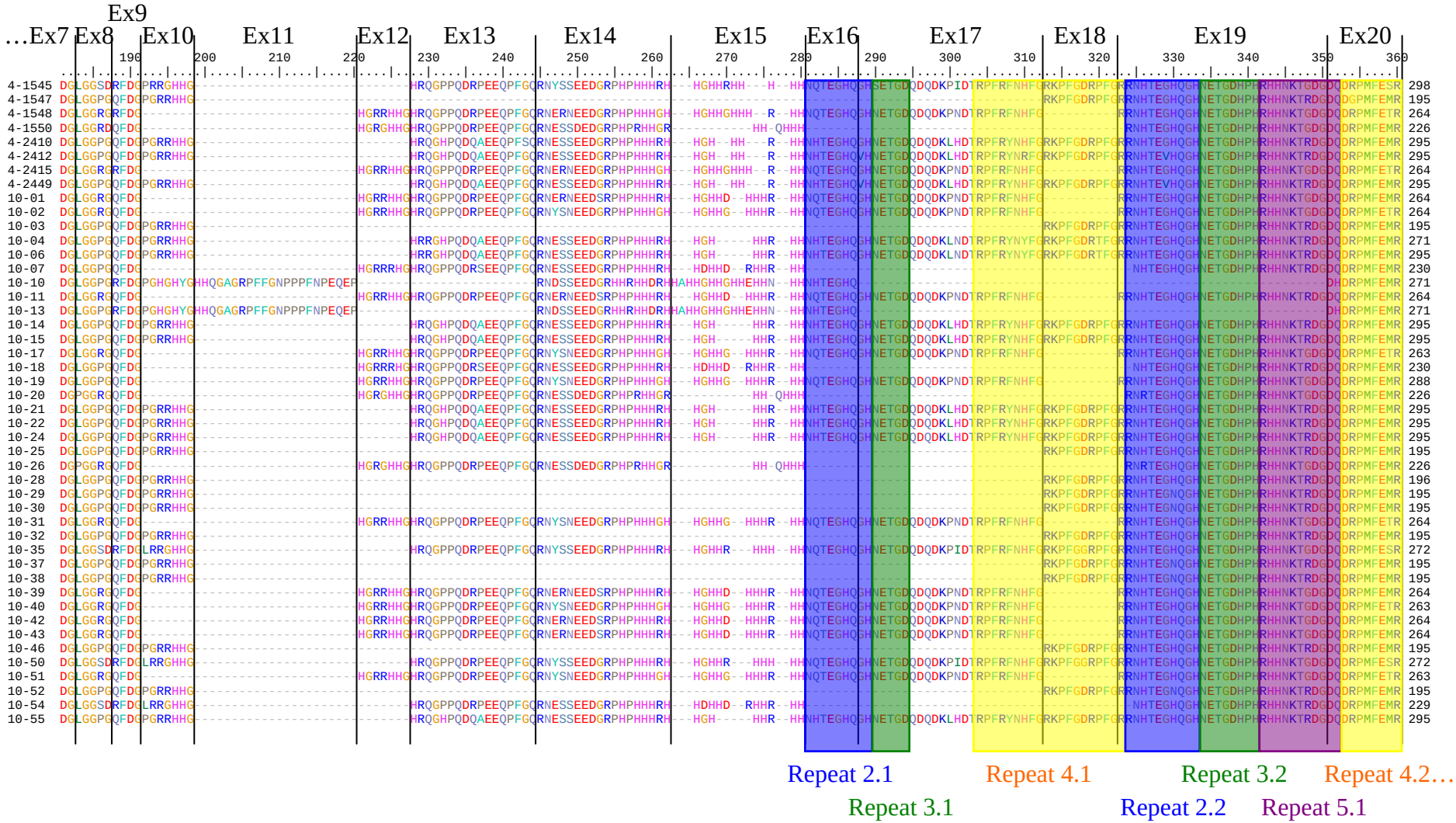
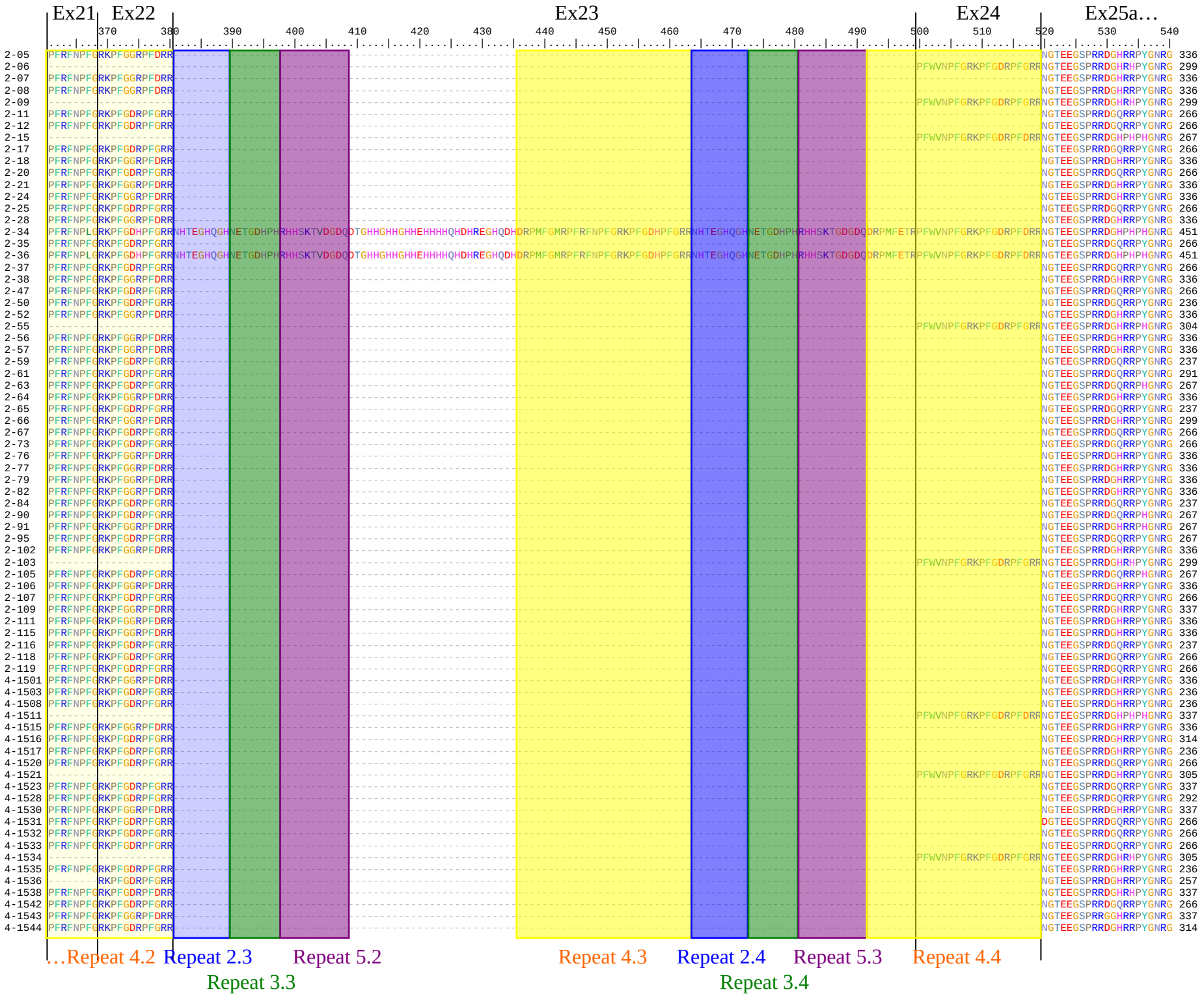
Additional File 3: Alignment of the encoded amino acid sequences. Vertical black lines indicate the element edges. Elements are labeled above the sequence. Repeats are indicated by colored boxes, which each different color (shades of red = type 1; blue = type 2; green = type 3; yellow = type 4; and purple = type 5).

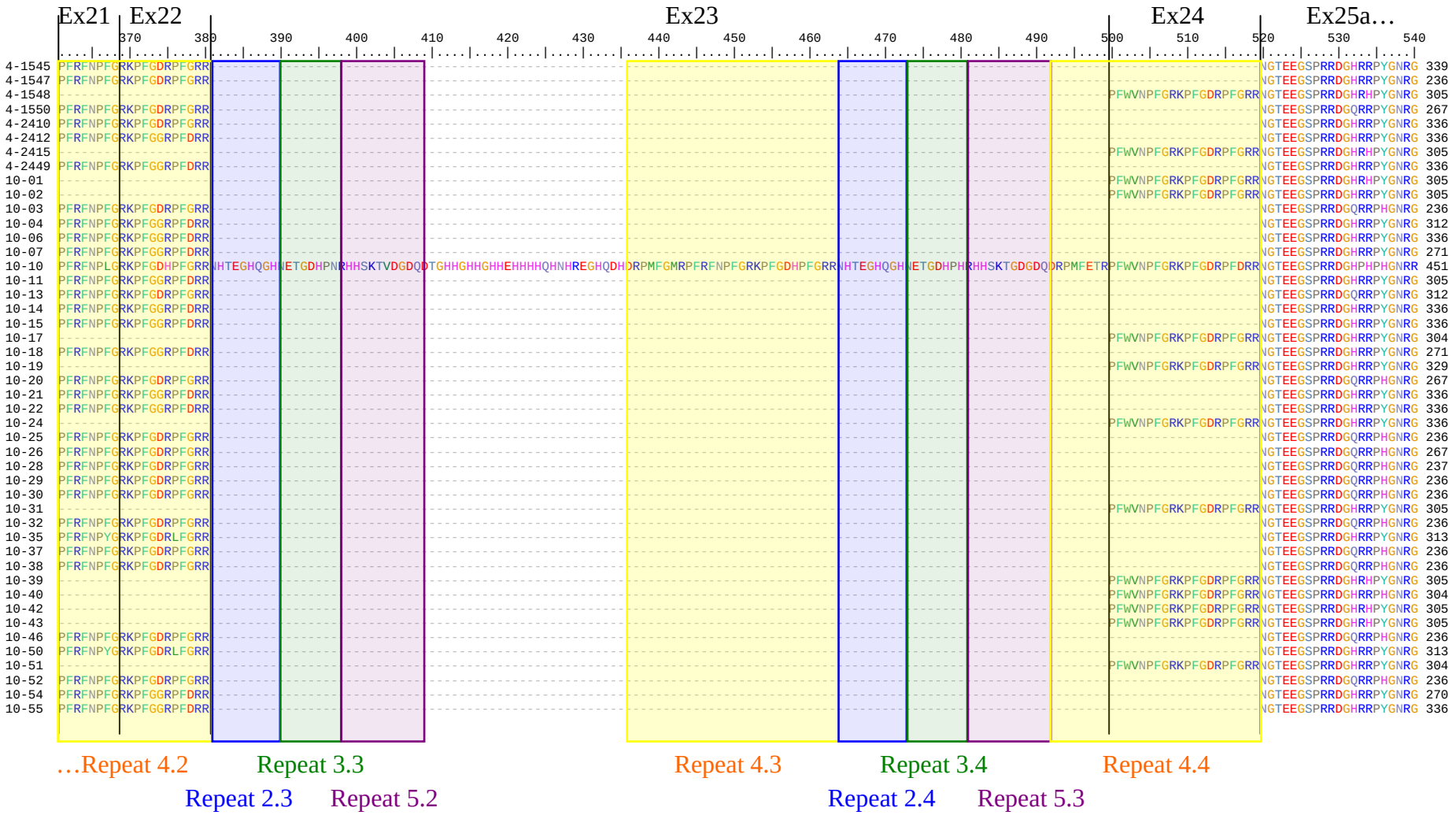

Leader
Ex1
Ex2
Ex3
Ex4
Ex5
Ex6
Ex7…
Repeat 1.1
Repeat 1.2
Repeat 1.3
Repeat 1.4


Leader
Ex1
Ex2
Ex3
Ex4
Ex5
Ex6
Ex7…
Repeat 1.1
Repeat 1.2
Repeat 1.3
Repeat 1.4


…Ex7
Ex8
Ex9
Ex10
Ex11
Ex12
Ex13
Ex14
Ex15
Ex16
Ex17
Ex18
Ex19
Ex20
Repeat 2.1
Repeat 3.1
Repeat 4.1
Repeat 2.2
Repeat 3.2
Repeat 5.1
Repeat 4.2…


…Ex7
Ex8
Ex9
Ex10
Ex11
Ex12
Ex13
Ex14
Ex15
Ex16
Ex17
Ex18
Ex19
Ex20
Repeat 2.1
Repeat 3.1
Repeat 4.1
Repeat 2.2
Repeat 3.2
Repeat 5.1
Repeat 4.2…


Ex21
Ex22
Ex23
Ex24
Ex25a…
…Repeat 4.2
Repeat 2.3
Repeat 5.2
Repeat 3.3
Repeat 4.3
Repeat 2.4
Repeat 5.3
Repeat 4.4
Repeat 3.4


Ex21
Ex22
Ex23
Ex24
Ex25a…
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4-1547 PFRFNPFGRKPFGDRPFGRR NGTEEGSPRRDGHRRPYGNRG 236
4-1548 PFWVNPFGRKPFGDRPFGRR NGTEEGSPRRDGHRHPYGNRG 305
4-1550 PFRFNPFGRKPFGDRPFGRR NGTEEGSPRRDGQRRPYGNRG 267
4-2410 PFRFNPFGRKPFGDRPFGRR NGTEEGSPRRDGHRRPYGNRG 336
4-2412 PFRFNPFGRKPFGGRPFDRR NGTEEGSPRRDGHRRPYGNRG 336
4-2415 PFWVNPFGRKPFGDRPFGRR NGTEEGSPRRDGHRHPYGNRG 305
4-2449 PFRFNPFGRKPFGGRPFDRR NGTEEGSPRRDGHRRPYGNRG 336
10-01 PFWVNPFGRKPFGDRPFGRR NGTEEGSPRRDGHRHPYGNRG 305
10-02 PFWVNPFGRKPFGDRPFGRR NGTEEGSPRRDGHRRPYGNRG 305
10-03 PFRFNPFGRKPFGDRPFGRR NGTEEGSPRRDGQRRPHGNRG 236
10-04 PFRFNPFGRKPFGGRPFDRR NGTEEGSPRRDGHRRPYGNRG 312
10-06 PFRFNPFGRKPFGGRPFDRR NGTEEGSPRRDGHRRPYGNRG 336
10-07 PFRFNPFGRKPFGGRPFDRR NGTEEGSPRRDGHRRPYGNRG 271
10-10 PFRFNPLGRKPFGDHPFGRRWHTEGHQGHWETGDHPNRHHSKTVDGDQDTGHHGHHGHHEHHHHQHNHREGHQDHDRPMFGMRPFRFNPFGRKPFGDHPFGRRWHTEGHQGHWETGDHPHRHHSKTGDGDQDRPMFETRPFWVNPFGRKPFGDRPFDRR NGTEEGSPRRDGHPHPHGNRR 451
10-11 PFRFNPFGRKPFGGRPFDRR NGTEEGSPRRDGHRRPYGNRG 305
10-13 PFRFNPFGRKPFGDRPFGRR NGTEEGSPRRDGQRRPYGNRG 312
10-14 PFRFNPFGRKPFGGRPFDRR NGTEEGSPRRDGHRRPYGNRG 336
10-15 PFRFNPFGRKPFGGRPFDRR NGTEEGSPRRDGHRRPYGNRG 336
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10-18 PFRFNPFGRKPFGGRPFDRR NGTEEGSPRRDGHRRPYGNRG 271
10-19 PFWVNPFGRKPFGDRPFGRR NGTEEGSPRRDGHRRPYGNRG 329
10-20 PFRFNPFGRKPFGDRPFGRR NGTEEGSPRRDGQRRPHGNRG 267
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10-24 PFWVNPFGRKPFGDRPFGRR NGTEEGSPRRDGHRRPYGNRG 336
10-25 PFRFNPFGRKPFGDRPFGRR NGTEEGSPRRDGQRRPHGNRG 236
10-26 PFRFNPFGRKPFGDRPFGRR NGTEEGSPRRDGQRRPHGNRG 267
10-28 PFRFNPFGRKPFGDRPFGRR NGTEEGSPRRDGQRRPHGNRG 237
10-29 PFRFNPFGRKPFGDRPFGRR NGTEEGSPRRDGQRRPHGNRG 236
10-30 PFRFNPFGRKPFGDRPFGRR NGTEEGSPRRDGQRRPHGNRG 236
10-31 PFWVNPFGRKPFGDRPFGRR NGTEEGSPRRDGHRRPYGNRG 305
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10-35 PFRFNPYGRKPFGDRLFGRR NGTEEGSPRRDGHRRPYGNRG 313
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10-38 PFRFNPFGRKPFGDRPFGRR NGTEEGSPRRDGQRRPHGNRG 236
10-39 PFWVNPFGRKPFGDRPFGRR NGTEEGSPRRDGHRHPYGNRG 305
10-40 PFWVNPFGRKPFGDRPFGRR NGTEEGSPRRDGHRRPHGNRG 304
10-42 PFWVNPFGRKPFGDRPFGRR NGTEEGSPRRDGHRHPYGNRG 305
10-43 PFWVNPFGRKPFGDRPFGRR NGTEEGSPRRDGHRHPYGNRG 305
10-46 PFRFNPFGRKPFGDRPFGRR NGTEEGSPRRDGQRRPHGNRG 236
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10-51 PFWVNPFGRKPFGDRPFGRR NGTEEGSPRRDGHRRPYGNRG 304
10-52 PFRFNPFGRKPFGDRPFGRR NGTEEGSPRRDGQRRPHGNRG 236
10-54 PFRFNPFGRKPFGGRPFDRR NGTEEGSPRRDGHRRPYGNRG 270
10-55 PFRFNPFGRKPFGGRPFDRR NGTEEGSPRRDGHRRPYGNRG 336
…Repeat 4.2
Repeat 3.3
Repeat 4.3
Repeat 3.4
Repeat 4.4
Repeat 2.3
Repeat 5.2
Repeat 2.4
Repeat 5.3

```
                 …Ex25a                 Ex25b
                     550       560       570       580
          ....|....|....|....|....|....|....|....|...
2-05      RWGENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEVK 377
2-06      RWGENESEEKEHPTTESITTSSPPEVVEIAVNEEDVNVVAEV* 342
2-07      RWSENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEV* 377
2-08      RWSENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEV* 377
2-09      RWGENESEEKEHPTTESITTSSPPEVVEIAVNEEDVNVVAEV* 342
2-11      RWGENESEEKEHPTTESVTTSSPP*VVEIAVNEEDINVVAEV* 309
2-12      RWGENESEEKEYPTTESVTTSSPP*VVEIAI-----NDVAEV* 304
2-15      RWGENESEEKEHPTTESVTTSSPLKVIEIAINEVDTNVVAEV* 310
2-17      RWGENESEEKEHPTTESVTTSSPP*VVEIAVNEEDINVVAEV* 309
2-18      RWGENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEV* 377
2-20      RWGENESEEKEYPTTESVTTSSPP*VVEIAI-----NDVAEV* 304
2-21      RWSENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEV* 377
2-24      RWGENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEV* 377
2-25      RWGENESEEKEYPTTESVTTSSPP*VVEIAI-----NDVAEV* 304
2-28      RWGENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEV* 377
2-34      RWGENESEEKEHPTTESVTTSSPLKVIEIAINEVDTNVVAEV* 494
2-35      RWGENESEEKEHPTTESVTTSSPP*VVEIAVNEEDINVVAEV* 309
2-36      RWGENESEEKEHPTTESVTTSSPLKVIEIAINEVDTNVVAEV* 494
2-37      RWGENESEEKEHPTTESVTTSSPP*VVEIAVNEEDINVVAEV* 309
2-38      RWSENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEV* 377
2-47      RWGENESEEKEHPTTESVTTSSPP*VVEIAVNEEDINVVAEV* 309
2-50      RWGENESEEKEYPTTESVTTSSPP*VVEIAI-----NDVAEV* 274
2-52      RWGENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEV* 377
2-55      RWGENESEEKEHPTTESVTTSSPPEVVEIAI-----NDVAEV* 342
2-56      RWGENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEV* 377
2-57      RWGENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEV* 377
2-59      RWGENESEEKEHPTMESVTTSSPPEVVEIAI-----NDVAEV* 275
2-61      RWGENESEEKEYPTTESVTTSSPP*VVEIAI-----NDVAEV* 329
2-63      RWGENESEEKEHPTTESVTTYSPP*VVEIAVNEEDINGVAEV* 310
2-64      RWSENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEV* 377
2-65      RWGENESEEKEHPTMESVTTSSPPEVVEIAINEVDTNGVAEV* 280
2-66      RWSENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEV* 340
2-67      RWGENESEEKEHPTTESVTTSSPP*VVEIAVNEEDINVVAEV* 309
2-73      RWGENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEV* 307
2-76      RWGENESEEKEHPTTDGVTTSSPPEVV--AINEEDINVVAEV* 377
2-77      RWSENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEV* 377
2-79      RWSENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEV* 377
2-82      RWGENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEE* 377
2-84      RWGENESEEKEHPTMESVTTSSPPEVVEIAI-----NDVAEV* 275
2-90      RWGENESEEKEHPTTESVTTYSPP*VVEIAVNEEDINGVAEVY 310
2-91      RWGENESEEKEHPTTESVTTSSPPEVVEIADN--DYDVVAESY 308
2-95      RWGENESEEKEYPTTESVTTSSPP*VVEIAI-----NDVAEV* 305
2-102     RWSENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEV* 377
2-103     RWGENESEEKEHPTTESITTSSPPEVVEIAVNEEDVNVVAEV* 342
2-105     RWGENESEEKEHPTTESVTTYSPP*VVEIAVNEEDINGVAEV* 310
2-106     RWGENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEV* 377
2-107     RWGENESEEKEHPTTESVTTSSPP*VVEIAVNEEDINVVAEV* 309
2-109     RWGENESEEKEHPTTDGVTTSSPPEVV--AINEEHINVVAEV* 378
2-111     RWSENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEE* 377
2-115     RWGENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEV* 377
2-116     RWGENESEEKEHPTMESVTTSSPPEVVEIAI-----NDVAEV* 275
2-118     RWGENESEEKEYPTTESVTTSSPP*VVEIAI-----NDVAEV* 304
2-119     RWGENESEEKEYPTTESVTTSSPP*VVEIAI-----NDVAEV* 304
4-1501    RWGENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEV* 377
4-1503    RWGENESEEKEHPTTESVTTSSPPEVVEIAI-----NDVAEV* 274
4-1508    RWGENESEEKEHPTTESVTTSSPPEVVEIAI-----NDVAEV* 274
4-1511    RWGENESEEKEHPTTESVTTSSPLKVIEIAINEVDTNVVAEV* 380
4-1515    RWSENESEEKEHPTTESVTTSSPPEVVEIAVNEEDINVVAEV* 379
4-1516    RWGENESEEKEHPTTESVTTSSPPEVVEIAFNEEDVNVVAEV* 357
4-1517    RWGENESEEKEHPTTESVTTSSPPEVVEIAI-----NDVAEV* 274
4-1520    RWGENESEEKEHPTTESVTTSSPP*VVEIAVNEEDINDVAEV* 309
4-1521    RWGENESEEKEHPTTESVTTSSPPEVVEIAVNEEDVNVVAEV* 348
4-1523    RWGENESEEKEHPTTESVTTSSPPDVVEIAVNEEDVNVVAEV* 380
4-1528    RWGENESEEKEHPTTESVTTSSPP*VVEIAVNEEDINDVAEV* 335
4-1530    RWGENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEV* 378
4-1531    RWGENESEEKEHPTTESVTTSSPP*VVEIAVNEEDINDVAEV* 309
4-1532    RWGENESEEKEHPTTESVTTSSPP*VVEIAVNEEDINDVAEV* 309
4-1533    RWGENESEEKEHPTTESVTTSSPP*VVEIAVNEEDINDVAEV* 309
4-1534    RWGENESEEKEHPTTESITTSSPPEVVEIAVNEEDVNMVAEV* 348
4-1535    RWGENESEEKEHPTTESVTTSSPPEVVEIAI-----NEVAEV* 274
4-1536    RWGENESEEKEHPTTESVTTSSPPEVVEIAVNEEDVNVVAEV* 300
4-1538    R*GENESEEKEHPTTESVATSSPPEVVEIAVNEEDVNVVAEV* 380
4-1542    RWGENESEEKEHPTTESVTTSSPP*VVEIAVNEEDINDVAEV* 309
4-1543    RWGENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEV* 378
4-1544    RWGENESEEKEHPTTESVTTSSPPEVVEIAVNEEDVNVVAEV* 357
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```
                 …Ex25a                 |      Ex25b
                 550       560          |  570       580
         ....|....|....|....|....|....|....|....|....|...
4-1545   RWGENESEEKEHPTTESVTTSSPPEVVEIAVNEEDVNVVAEV*  382
4-1547   RWGENESEEKEHPTTESVTTSSPPEVVEIAI-----NDVAEV*  274
4-1548   RWGENESEEKEHPTTESITTSSPPEVVEIAVNEEDVNMVAEV*  348
4-1550   RWGENESEEKEHPTTESVTTSSPP*VVEIAVNEEDINVVAEV*  310
4-2410   RWGENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEV*  377
4-2412   RWSENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEV*  377
4-2415   RWGENESEEKEHPTTESITTSSPPEVVEIAVNEEDVNMVAEV*  348
4-2449   RWSENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEV*  377
10-01    RWGENESEEKEHPTTESVTTSSPPEVVEIAVNEEDVNVVAEV*  348
10-02    RWGENESEEKEHPTTESVTTSSPPEVVEIAVNEEDVNVVAEV*  348
10-03    RWGENESEEKEHPTTESVTTSSPPEVVEIAI-----NDVAEV*  274
10-04    RWGENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEV*  353
10-06    RWGENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEV*  377
10-07    RWGENESEEKERPTTESVTTSSPPEVVEIAFNEEDVHVVAEV*  314
10-10    RWGENESEEKEHPTTESVTTSSPLKVIEIAINEVDTNVVAEV*  494
10-11    RWGENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEV*  346
10-13    RWGENESEEKEHPTTESVTTSSPPEVVEIAVNEEDVNVVAEV*  355
10-14    RWGENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEV*  377
10-15    RWGENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEV*  377
10-17    RWGENESEEKEHPTTESVTTSSPPEVVEIAVNEEDVNVVAEV*  347
10-18    RWGENESEEKERPTTESVTTSSPPEVVEIAFNEEDVNVVAEV*  314
10-19    RWGENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEV*  370
10-20    RWGENESEEKEHPTTESVTTYSPP*VVEIAVNEEDINGVAEV*  310
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10-22    RWGENESEEKEHPTTESVTTSSPPEVV--AINEEDINVVAEV*  377
10-24    RWGENESEEKEHPTTESVTTSSPPEVVEIAVNEEDVNVVAEV*  379
10-25    RWGENESEEKEHPTTESVTTSSPPEVVEIAI-----NDVAEV*  274
10-26    RWGENESEEKEHPTTESVTTYSPP*VVEIAVNEEDINGVAEV*  310
10-28    RWGENESEEKEHPTTESVTTSSPPEVVEIAI-----NDVAEV*  275
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10-31    RWGENESEEKEHPTTESVTTSSPPEVVEIAVNEEDVNVVAEV*  348
10-32    RWGENESEEKEHPTTESVTTSSPPEVVEIAI-----NDVAEV*  274
10-35    RWGENESEEKEHPTTESVTTSPPAEVVEIAFNEEDVNVVAEV*  356
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10-39    RWGENESEEKEHPTTESVTTSSPPEVVEIAVNEEDVNVVAEV*  348
10-40    RWGENESEEKEHPTTESVTTSSPPEVVEIAI-----NDVAEV*  342
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10-43    RWGENESEEKEHPTTESVTTSSPPEVVEIAVNEEDVNVVAEVL  348
10-46    RWGENESEEKEHPTTESVTTSSPPEVVEIAI-----NDVAEV*  274
10-50    RWGENESEEKEHPTTESVTTSSPPEVVEIAFNEEDVNVVAEV*  356
10-51    RWGENESEEKEHPTTESVTTSPPPEVVEIAVNEEDVNVVAEV*  347
10-52    RWGENESEEKEHPTTESVTTSSPPEVVEIAI-----NDVAEV*  274
10-54    RWGENESEEKERPTTESVTTSSPPEVVEIAFNEEDVNVVAEV*  313
10-55    RWGENESEEKEHPTTESVTTSSPPEVVEIAVNEEDVNVVAEV*  379
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