Figure S1A. Unrooted NJ tree **of SIVsmE660** stock (black) and variants at ramp-up from animal **CG7V** (blue). Predominant lineage chosen to deduce the T/F consensus consists of the CG7V sequences inside the orange rectangle.
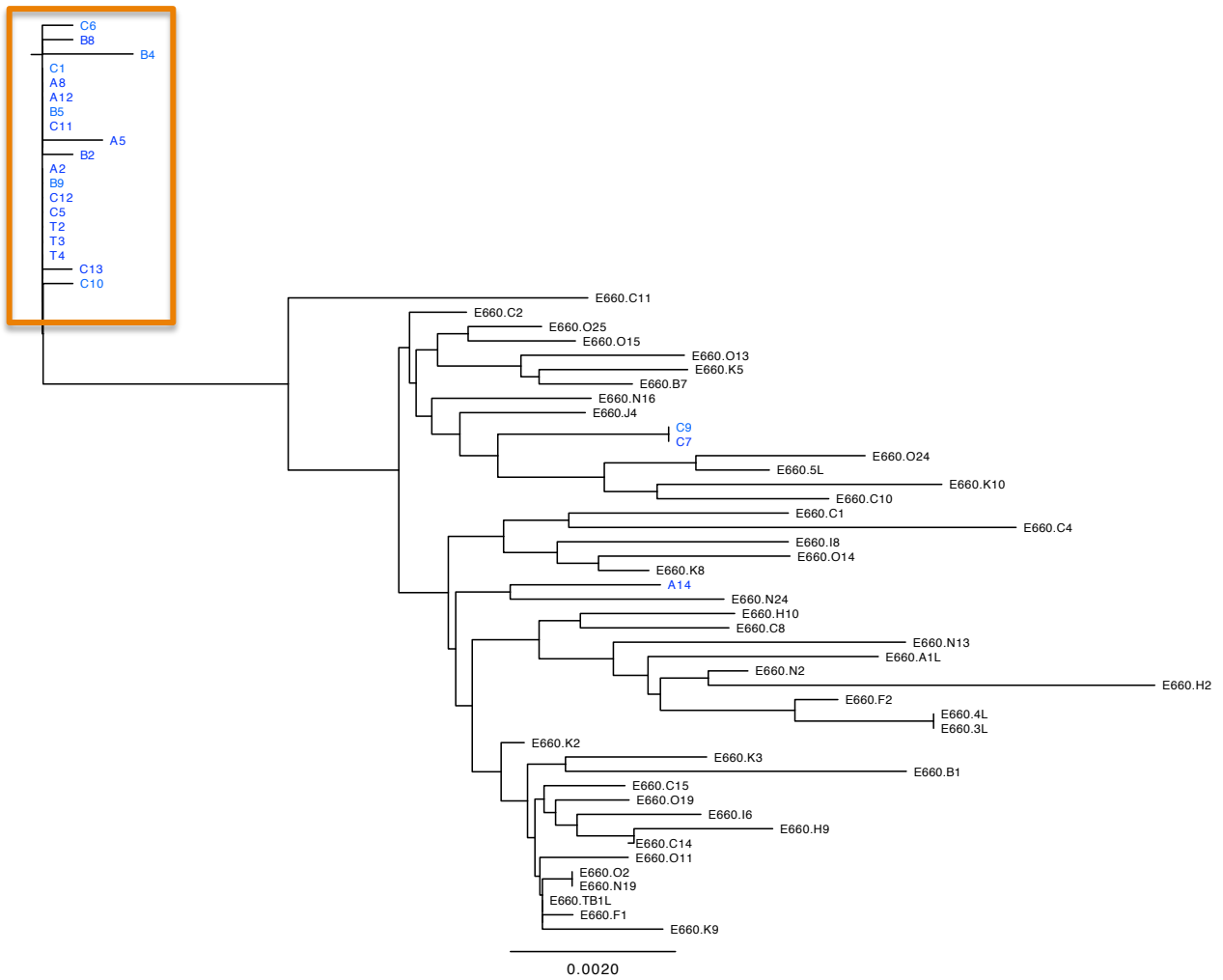
Figure S1B. Unrooted NJ tree of **SIVsmE660** stock (black) and variants at ramp-up from animal **CP3C** (blue). Predominant lineage chosen to deduce the T/F consensus consists of the CP3C sequences inside the orange rectangle.

Figure S1C. Unrooted NJ tree of **SIVsmE660** stock (black) and variants at ramp-up from animal **CG87** (blue). Predominant lineage chosen to deduce the T/F consensus consists of the CG87 sequences inside the orange rectangle.

Figure S1D. Unrooted NJ tree of **SIVsmE660** stock (black) and variants at ramp-up from animal **CG7G** (blue). Predominant lineage chosen to deduce the T/F consensus consists of the CG7G sequences inside the orange rectangle.

Figure S1E. Unrooted NJ tree of **SIVsmE660** stock (black) and variants at ramp-up from animal **CP37** (blue). A single predominant lineage could not be clearly identified and thus animal CP37 was discarded from the present study.
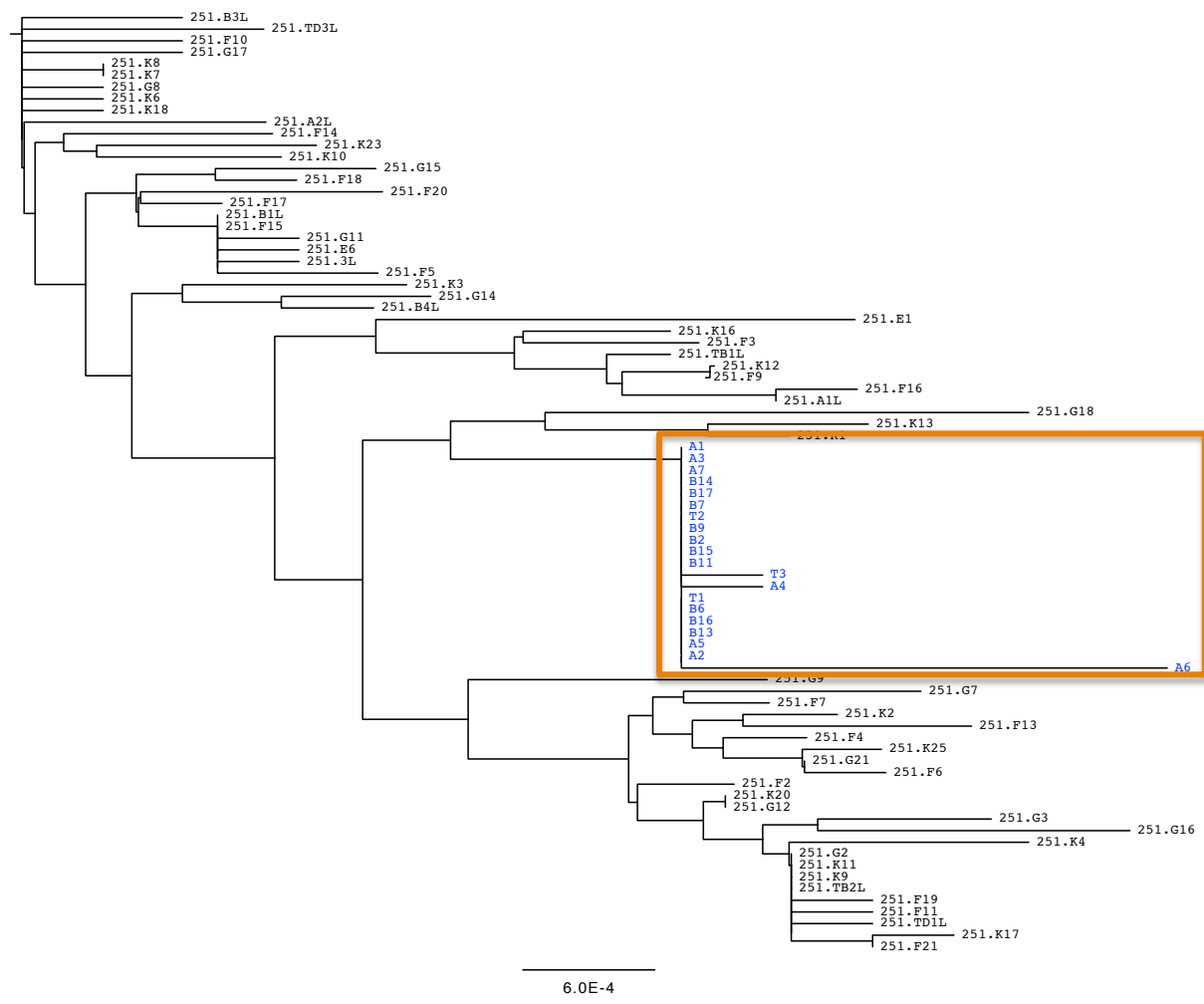
Figure S2A. Unrooted NJ tree of **SIVmac251** stock (black) and variants at ramp-up from animal **AV66** (blue). Predominant lineage chosen to deduce the T/F consensus consists of the AV66 sequences inside the orange rectangle.

Figure S2B. Unrooted NJ tree of **SIVmac251** stock (black) and variants at ramp-up from animal **CP1W** (blue). Predominant lineage chosen to deduce the T/F consensus consists of the CP1W sequences inside the orange rectangle.
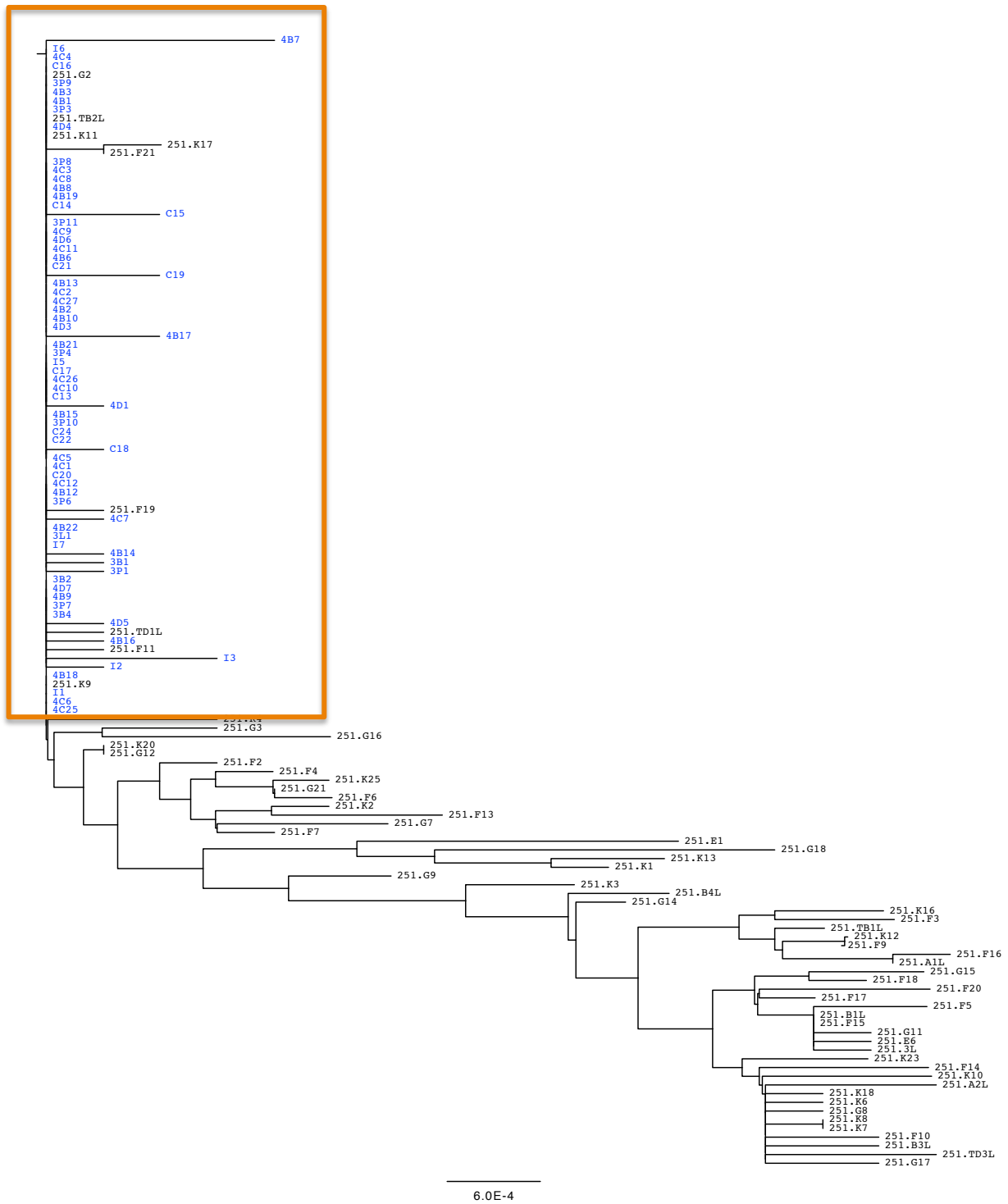
Figure S2C. Unrooted NJ tree of **SIVmac251** stock (black) and variants at ramp-up from animal **CT76** (blue). Predominant lineage chosen to deduce the T/F consensus consists of the CT76 sequences inside the orange rectangle.

Figure S2D. Unrooted NJ tree of **SIVmac251** stock (black) and variants at ramp-up from animal **PBE** (blue). Predominant lineage chosen to deduce the T/F consensus consists of the PBE sequences inside the orange rectangle.
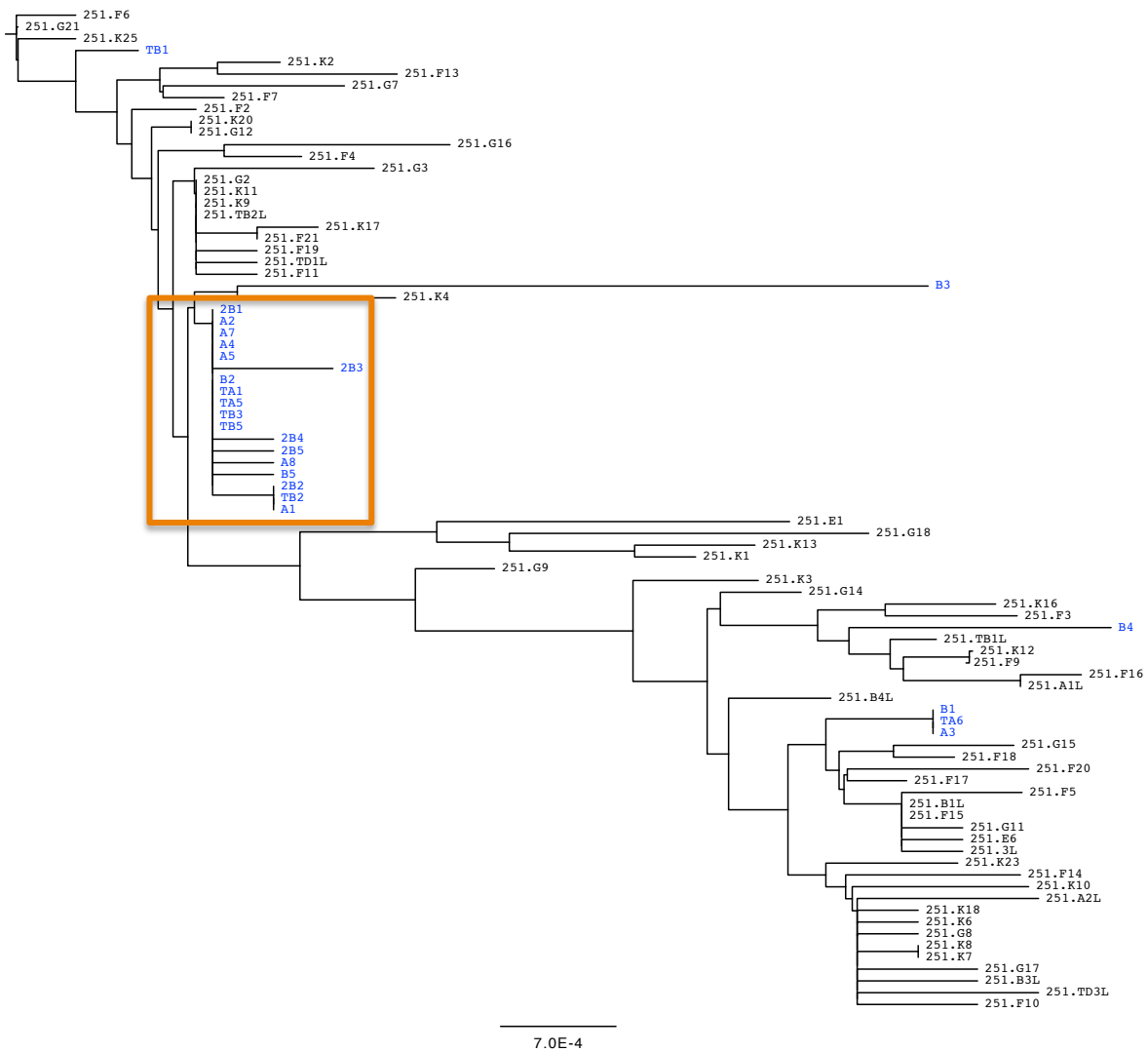
Figure S2E. Unrooted NJ tree of **SIVmac251** stock (black) and variants at ramp-up from animal **CR2A** (blue). Predominant lineage chosen to deduce the T/F consensus consists of the CR2A sequences inside the orange rectangle.

Figure S2F. Unrooted NJ tree of **SIVmac251** stock (black) and variants at ramp-up from animal **AV74** (blue). Predominant lineage chosen to deduce the T/F consensus consists of the AV74 sequences inside the orange rectangle.

Figure S2G. Unrooted NJ tree of **SIVmac251** stock (black) and variants at ramp-up from animal **CG71** (blue). Predominant lineage chosen to deduce the T/F consensus consists of the CG71 sequences inside the orange rectangle.
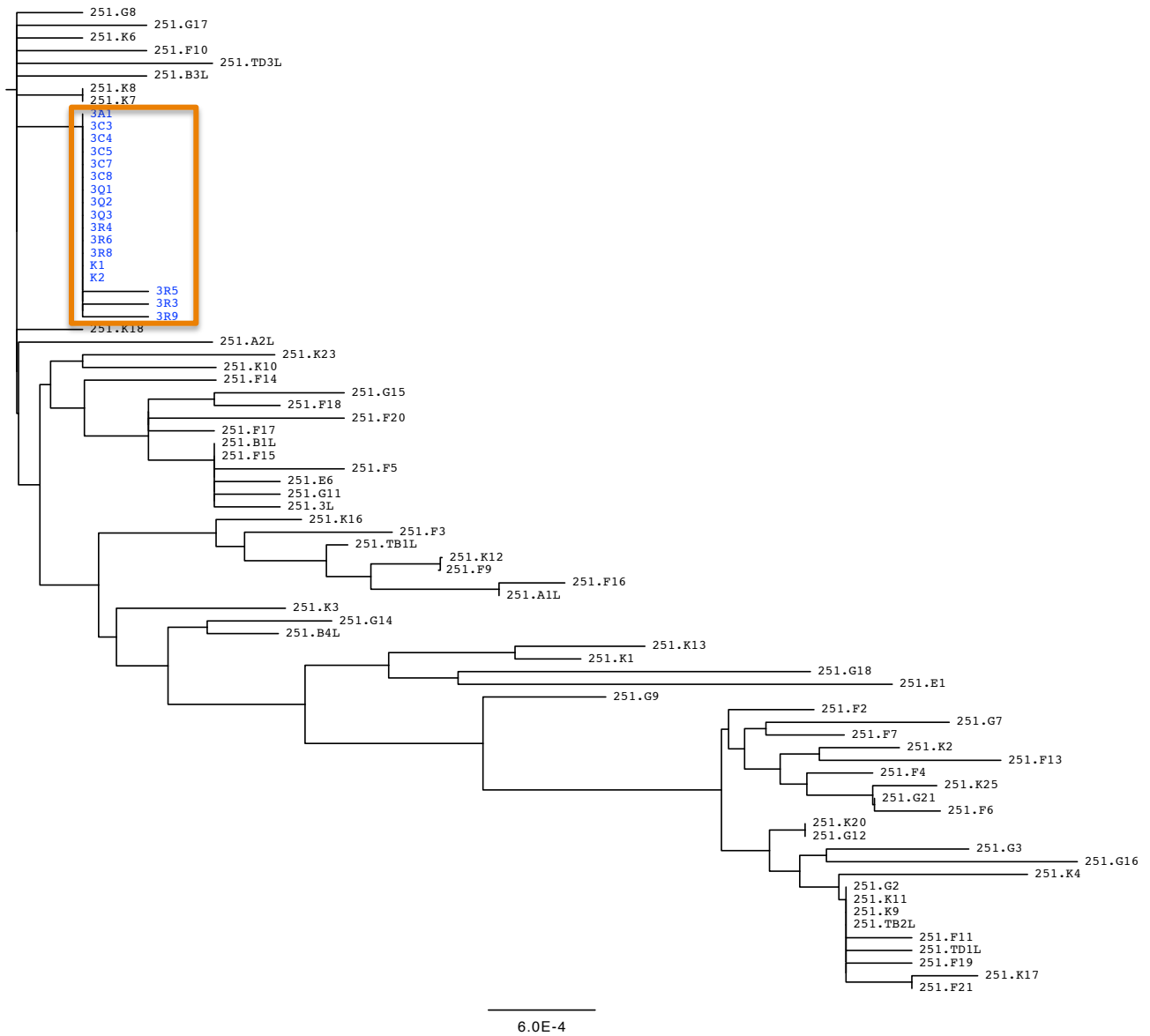
A2
D2
A10
A1
C8
D15
D3
D11
C10
C25
D1
D12
C20
D6
D13
C15
C13
C16
C19
D14
C5
A4
C12
C7

251.TD3L
251.K18
251.A2L
251.B3L
251.K6
251.F10
251.G8
251.G17
251.K8
251.K7
251.F14
251.G15
251.F18
251.F20
251.F17
251.E6
251.B1L
251.G11
251.3L
251.F15
251.F5
251.K23
251.K10
251.K16
251.F3
251.TB1L
251.K12
251.F9
251.F16   C2
251.A1L
251.K3
251.G14
251.B4L
251.K13
251.K1
251.G18
251.E1
251.G9
251.K20
251.G12
251.G3
251.G16
251.K4
251.G2
251.K11
251.K9
251.TB2L
251.F19
251.F11
251.TD1L
251.K17
251.F21
251.F2
251.G7
251.F7
251.K2
251.F13
251.F4
251.G21
251.F6
251.K25
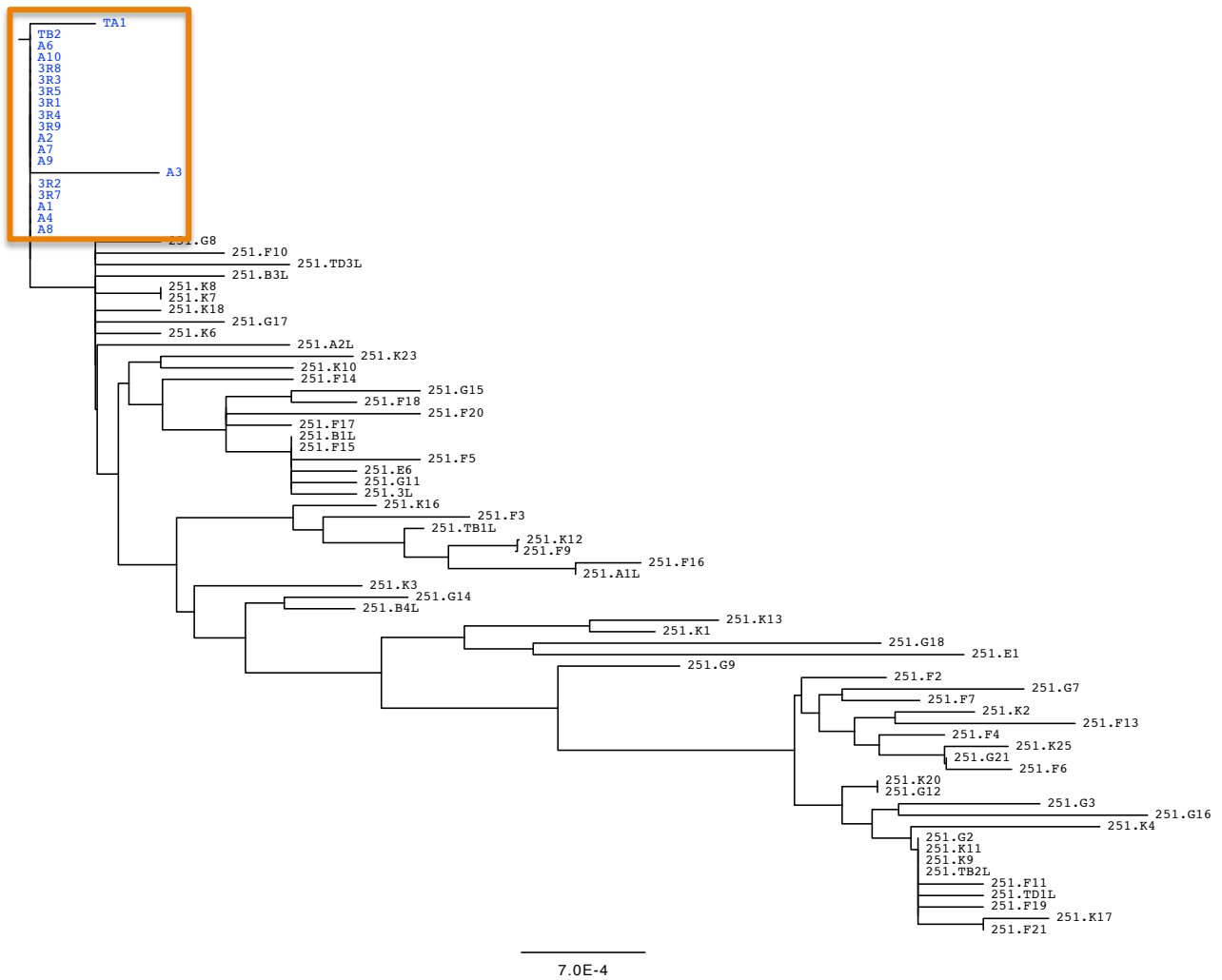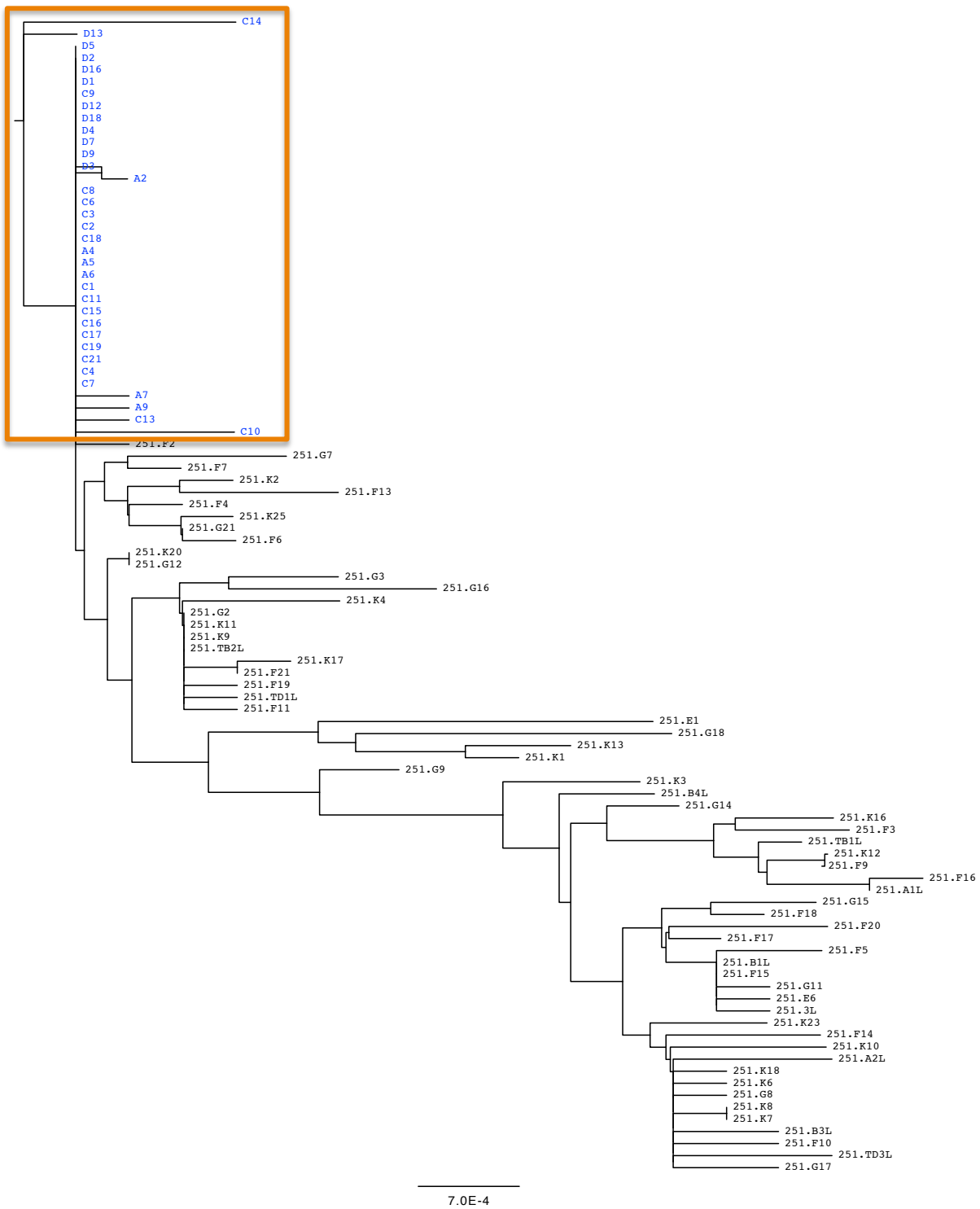A3
A5
A8
C1
C11
C14
C23
C24
C26
C4
C6
D7
D9
A9

7.0E-4

Figure S2H. Unrooted NJ tree of **SIVmac251** stock (black) and variants at ramp-up from animal **CG5G** (blue). Predominant lineage chosen to deduce the T/F consensus consists of the CG5G sequences inside the orange rectangle.

Figure S3A. Unrooted NJ tree of **SHIVBaL** stock (black) and variants at ramp-up from animal **R557**(blue). Predominant lineage chosen to deduce the T/F consensus consists of the R557 sequences inside the orange rectangle.

Figure S3B. Unrooted NJ tree of **SHIVBaL** stock (black) and variants at ramp-up from animal **HJ38** (blue). Predominant lineage chosen to deduce the T/F consensus consists of the HJ38 sequences inside the orange rectangle.
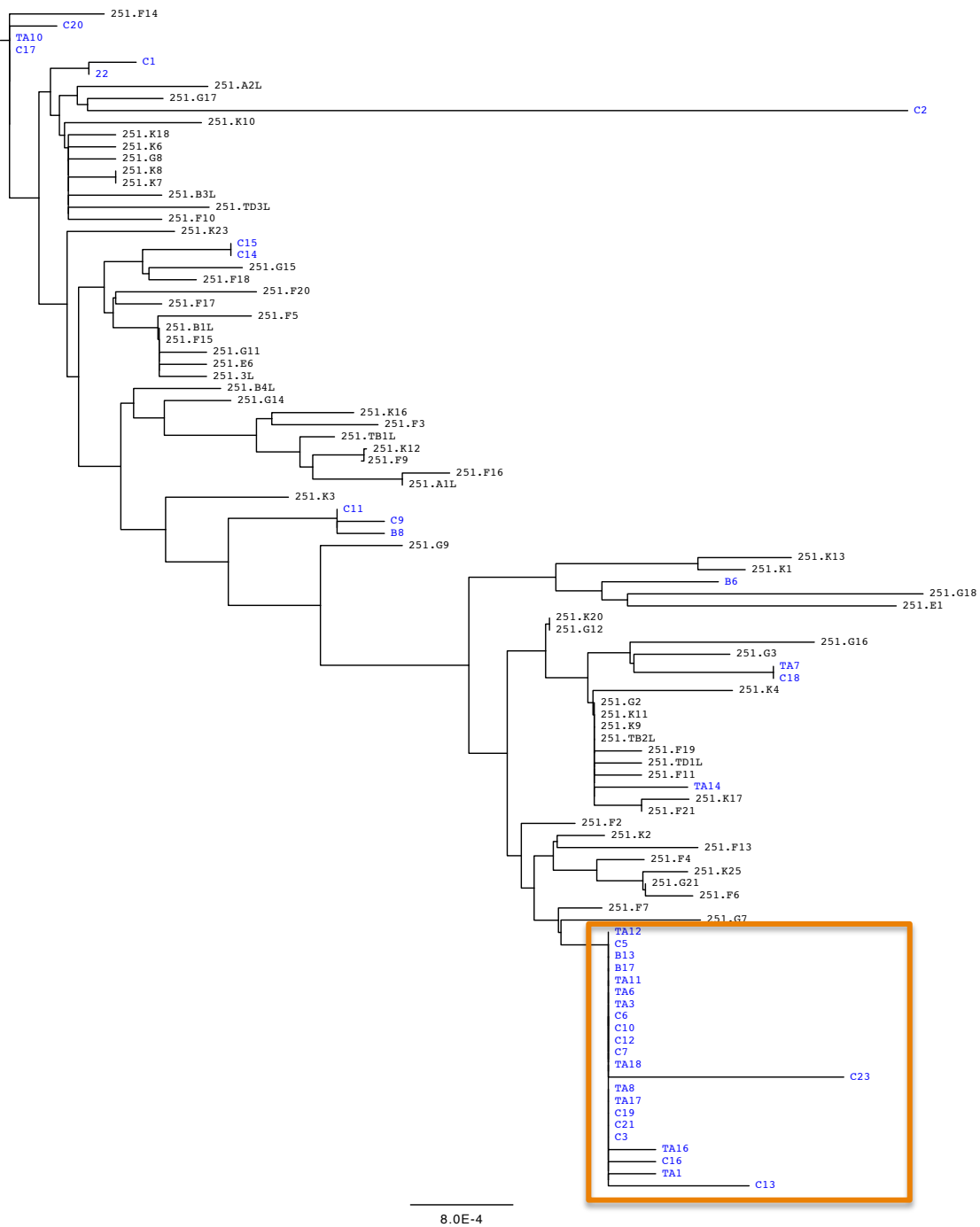
Figure S3C. Unrooted NJ tree of **SHIVBaL** stock (black) and variants at ramp-up from animal **HL02** (blue). Predominant lineage chosen to deduce the T/F consensus consists of the HL02 sequences inside the orange rectangle.

Figure S3D. Unrooted NJ tree of **SHIVBaL** stock (black) and variants at ramp-up from animal **HL16** (blue). Predominant lineage chosen to deduce the T/F consensus consists of the HL16 sequences inside the orange rectangle.
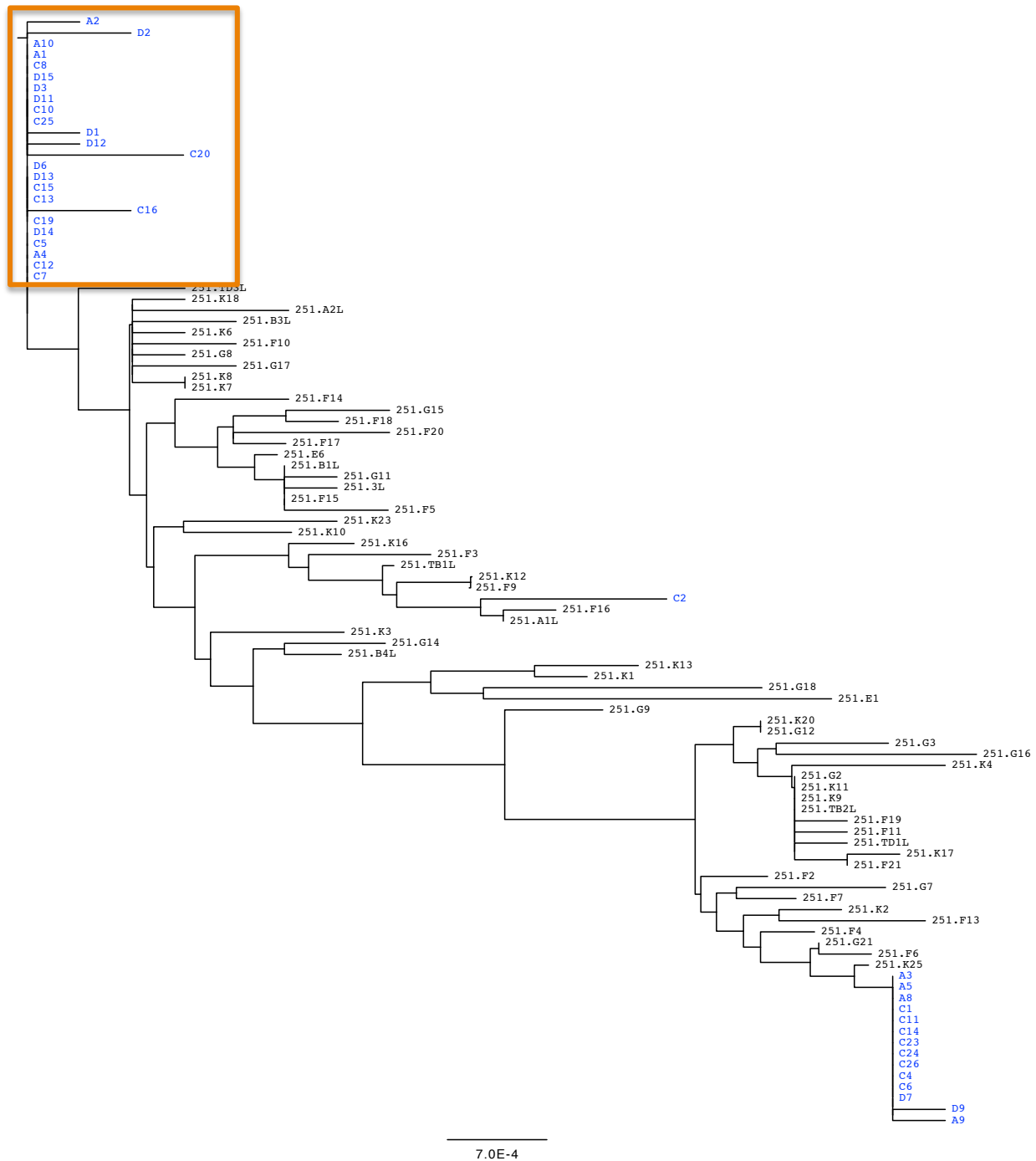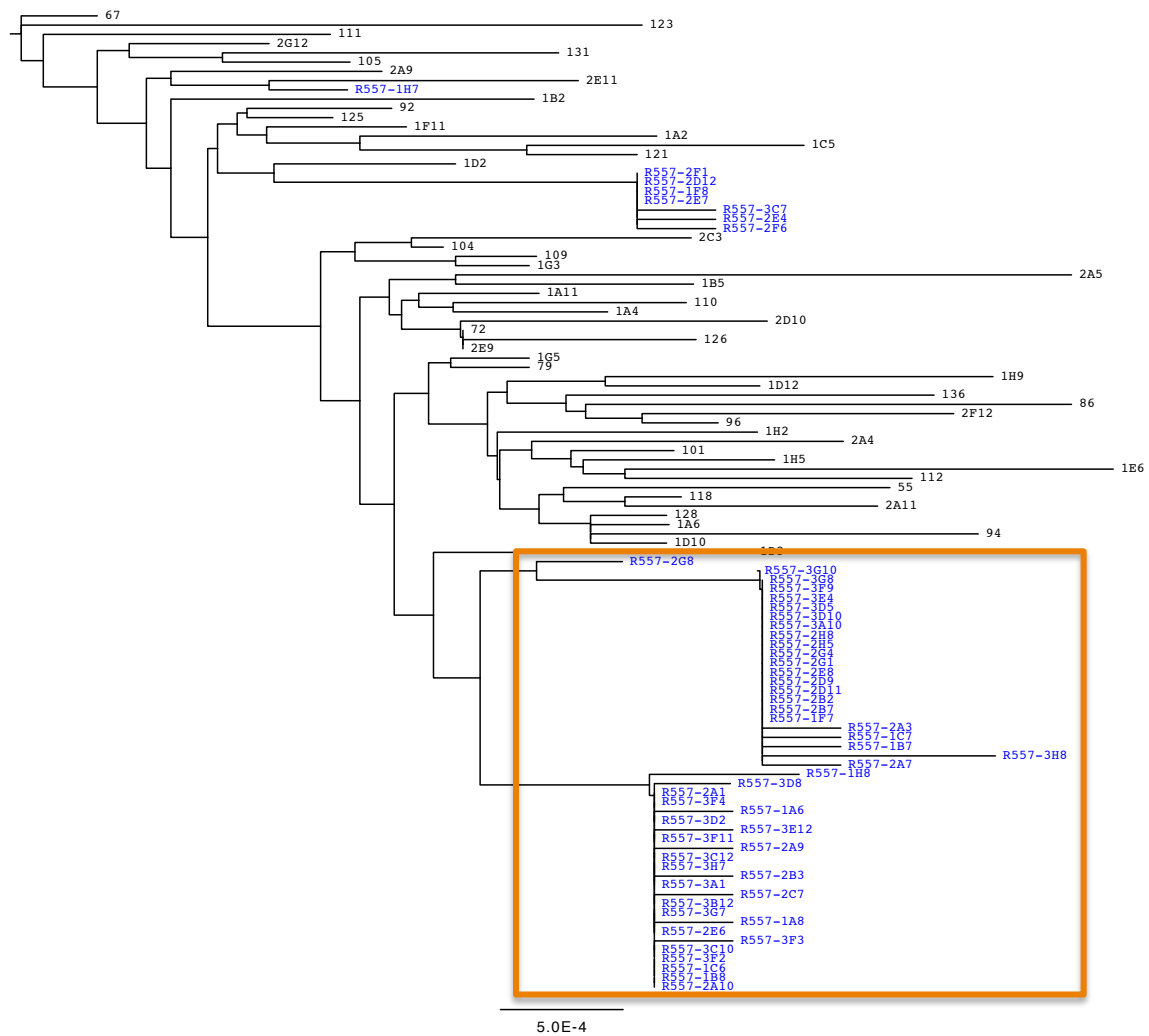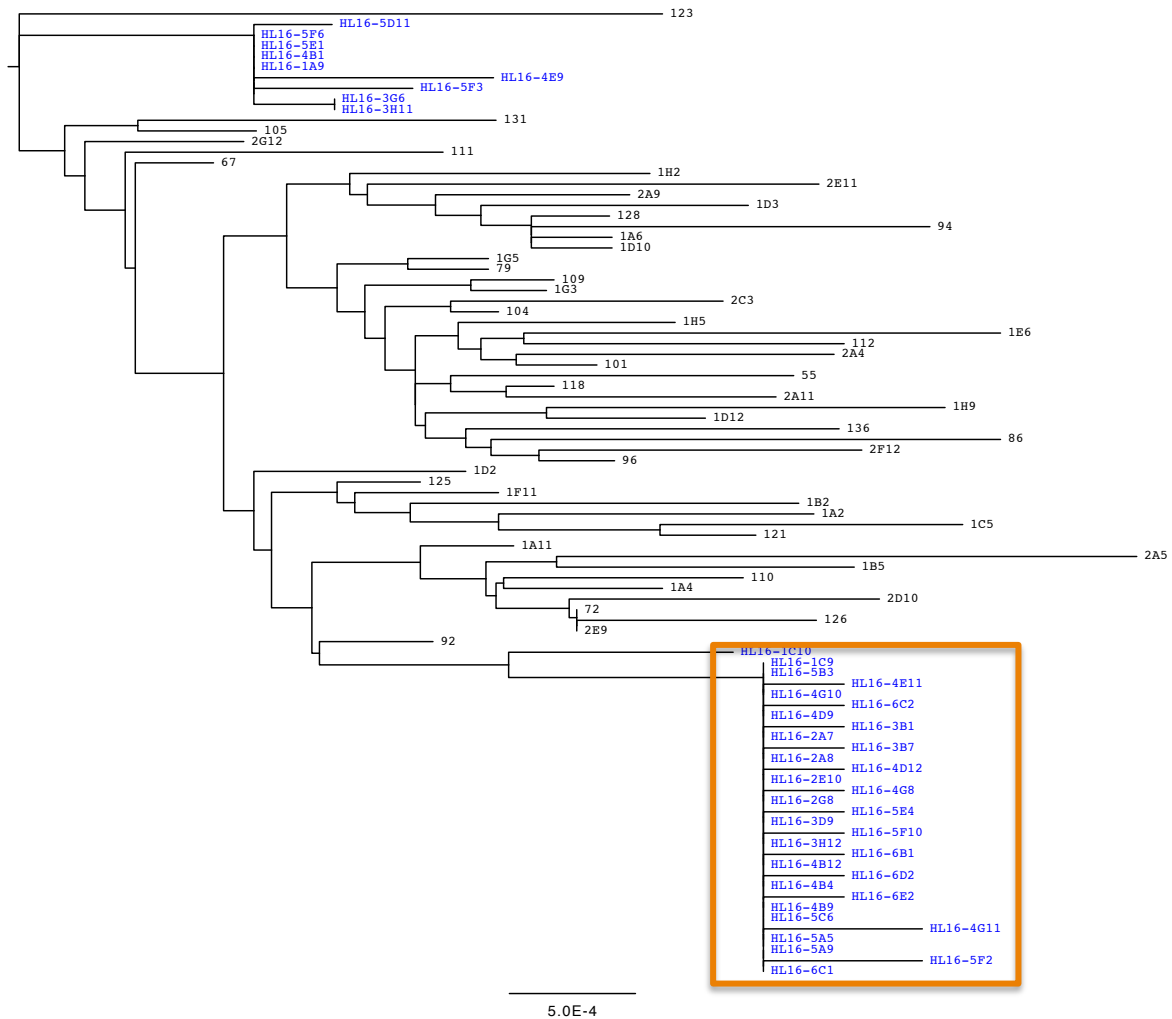
```
                                    6     9                                    33
     KeeleE660|stock    M S S     T E E E L R K R L R L I     H F L H Q T S K M G C L G N Q L L I A L   L L V S A L E I Y C V Q Y V
     KeeleE660|f.       . . .     . . . . . . R . . . . .     . . . . . . . . . . . . . . . . . . . .   . . . . . . . . . . I . . .
     Keelemac251|stock  . . . H G R . . . . . K . . . . .     . L . . . . . . Y . . . . . . . I   . . L . V Y G . . . T . . .
S    Keelemac251|f.     . . . H E R . . . . . K . . . . .     . L . . . . . . . . . . . . . . I   . . L . V Y G . . . T . . .
I    RoedE660|stock                                            . . . . . . . . . . . . . . . . . . . .   . . . . . . . . . . V . . .
V    RoedE660|control f.                                       . . . . . . . . . . . . . . . . . . . .   . . . . . . . . . . V . . .
     RoedE660|gag f.                                           . . . . . . . . . . . . . . . . . . . .   . . . . . . . . . . V . . .
     RoedE660|mosEnv f.                                        . . . . . . . . . . . . . . . . . . . .   . . . . . . . . . . I . . .
     RoedE660|m239Env f.                                       . . . . . . . . . . . . . . . . . . . .   . . . . . . . . . . I . . .

     HXB2|1906385         M R V K E   K   Y Q H L W R W G       W R W . T M     . . G M L   M I C S A T E       K L W V
     KleinSHIV|stock      . . . T E I R K S . . . W             . . . . I .     . . . I .   . . . N . E .         . . . .
     KleinSHIV|f.         . . . T . . . K S . . . W             . . . . I .     . . . I .   . . . N . E .         . . . .
     pSF257-SHIV f.       N . . R G . . K N . W . W G . . G I   . . . . . M .   . . . . .   . . Y N . . G       Q . . .
S    Step|placebo f.      . . . . G . . K N   . . .             . . . . . .     . . . . .   . . . . A .           . . . .
H    Step|vaccine f.      E . A E D S G N E S R G S     G R I I S T . . . . I . . . . . . . . . . . . . . .       Q . . .
I    Gnanakaran|orig. FS2 . . . . . . . K N W . . .             . . . . . . G M M . . . . . . . . . . A .   N L . G . .
V    Gnanakaran|orig. FS3 . . . . G . . K N . . . .             . K . . I .     . . . . . . . . . . . . A .     Q . . .
     Gnanakaran|orig. FS4 . . . . . T . R N W . . .             . K . . . .     . . . . . . . . . . . . A .     Q . . .
     Gnanakaran|orig. FS5 . . . . G . . K N . . . . . . G D     I . . . . . .   . . . . . . . . . . . . A .   E G Q . . .
H    Gnanakaran|orig. FS6 . K . . . . . K N C P C .             . . G . . L     . . . . . . . . . . . . A .     Q . . .
I    Gnanakaran|orig. FSC . . . . G . . R N . . . . . G . G T M R L . . . . S . L I M . . . . . . M . . . . . A K   Q E Q . . .
V    Gnanakaran|hold. FS2 . . . . . . . K N . . . . . . G I M L   L . . . I .   . . . . . M . . . . . A     E Q . . .
     Gnanakaran|hold. FS3 . . . . . . . R N W . . .             . K . . . .     . . . . . . . . . . . A .     Q . . .
     Gnanakaran|hold. FS4 . . . . . . . K N . . . . . . G I M L L . K . . I .   . . . I . . . . . . G G       . . . .
     Gnanakaran|hold. FS5 . . . . G . . K N . . . .             . . . . I .     . . . I . . . . . . A .       N . . .
     Gnanakaran|hold. FS6 . . . . G . . K N C . . .             . . G . I L     . . . . . . . . . . . N K E N . . .
     Gnanakaran|hold. FSC . . . . G . . K N . . . . . . G G I L N L . . G . . .   . . . . . M . . . . . A A     E Q . . .
                                                                                                                        *
```

```
                         55             64                                      88
     KeeleE660|stock    T V F Y G V P A W K N A T I P L F C   T   T R N R D T W G T T Q C L P D N D D Y S E L A I   S I
     KeeleE660|f.       . . . . . . . . . . . . . . . . . .   A   . K . . . . . . . . . . . . . . . . . . . . . .   N .
     Keelemac251|stock  . . . . . . . . . R . . . . . . . .   A   . K . . . . . . . . . . . . . . G . . . . . . L   N V
S    Keelemac251|f.     . . . . . . . . . R . . . . . . . .   A   . K . . . . . . . . . . . . . . G . . . . . . L   N V
I    RoedE660|stock     . . . . . . . . . . . . . . . . . .   T   . R . . . . . . . . . . . . . . . . . . . . . .   S .
V    RoedE660|control f.. . . . . . . . . . . . . . . . . .   T   . R . . . . . . . . . . . . . . . . . . . . . .   S .
     RoedE660|gag f.    . . . . . . . . . . . . . . . . . .   T   . R . . . . . . . . . . . . . . . . . . . . . .   S .
     RoedE660|mosEnv f. . . . . . . . . . . . . . . . . . A T . K . . . . . . . . . . . . . . . . . . . L . . . .   N .
     RoedE660|m239Env f.. . . . . . . . . . . . . . . . . .   A   . K . . . . . . . . . . . . . . . . . . . . . .   N .
     HXB2|1906385       T V Y Y G V P V W K E A T T T L F C   A   S D A K A Y D T E V H N V W A T H A C V P T D P N P Q E V V L V   N V
     KleinSHIV|stock    . . . . . . . . . . . . . . . . . .   A   . . . . . . . . E E . . . . . . . . . . . . . . . . . . E . K   N .
     KleinSHIV|f.       . . . . . . . . . . . . . . . . . .   A   . . . . . . . . E . . . . . . . . . . . . . . . . . . E . K   N .
     pSF257-SHIV f.     . . . . . . . . . . . . . . . . . .   A   . . . . . . . . E . . . . . . . . . . . . . . . . . E . . N .
S    Step|placebo f.    . . . . . . . . . . . . . . . . . .   A   . . . . . . . . E . . . . . . . . . . . . . . . . E N .
H    Step|vaccine f.    . . . . . . . . . . . . . . . . . .   A   . . . . . . . . E . . . . . . . . . . . . . . . . E N .
I    Gnanakaran|orig. FS2 . . . . . . . . . . . . . . . . .   A   . . . . . . . . E . . . . . . . . . . . . . . . . E N .
V    Gnanakaran|orig. FS3 . . . . . . . . . . . . . . . . .   A   . . . . . . . . E . . . . . . . . . . . . . . . . E N .
     Gnanakaran|orig. FS4 . . . . . . . . . . . . . . . . .   A   . . . . . . . . E . . . . . . . . . . . . . . . . E N .
     Gnanakaran|orig. FS5 . . . . . . . . . . . . . . . . .   A   . . . . . . . . E . . . . . . . . . . . . . . . . E N .
H    Gnanakaran|orig. FS6 . . . . . . . . . . . . . . D . .   A   . . . . . . . . E . . . . . . . . . . . . . . . . G N .
I    Gnanakaran|orig. FSC . . . . . . . . . . . . . . . . .   A   . . . . . . . . E . . . . . . . . . . . . . . . . E N .
V    Gnanakaran|hold. FS2 . . . . . . . . . . . . . . . . .   A   . . . . . . . . E . . . . . . . . . . . . . . . . E N .
     Gnanakaran|hold. FS3 . . . . . . . . . . . . . . . . .   A   . . . . . . . . E K . . . . . . . . . . . . . . . E N .
     Gnanakaran|hold. FS4 . . . . . . . . . . . . . . . . .   A   . . . . . . . . E . . . . . . . . . . . . . . . . E N .
     Gnanakaran|hold. FS5 . . . . . . . . . . . . . . . . .   A   . . . . . . . . E . . . . . . . . . . . . . . . . E N .
     Gnanakaran|hold. FS6 . . . . . . . . . . . . . . . . .   A   . . . . . . . . E . . . . . . . . . . . . . . . . E N .
     Gnanakaran|hold. FSC . . . . . . . . . . . . . . . . .   A   . . . . . . . . E . . . . . . . . . . . . . . . . E N .
                         *   *     *   *   *     *   *   *   *     *     *   *   *                 *   *     *   *                       *
```

Figure S6:
Alternative alignment to that shown on Fig. 2. This alignment was built using individual
Gnanakaran-HIV sequences from Fiebig stages 2-5 rather than a consensus of all acute sequences,
as shown on Fig.2. Note that Gnanakaran et al.'s signature site H12 (in orange) corresponds to
HXB2 site H9 in this alignment. In this alternative alignment, the signature residue on the signal
peptide falls on position 6 rather than on site 9. Asterisks mark sites with complete conservation
across all datasets.