**Appendix A1.2.** Data sets for the *Lentivirus* case study: sampling level, calibration method, host species, virus, time-frame of data set, median rate estimate and 95% credibility interval, phylogenetic tree prior according to Bayes factors, substitution model according to the Bayesian information criterion, and result of date-randomization test. a GenBank accession numbers for each analysis.

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| **Keya** | **Sampling level** | **Molecular clock calibration method** | **Host species** | **Virus** | **Time-frame of calibrations (years)** | **Median rate 103** | **Rate 95%**  **Credible interval** | **Median posterior root height (years)** | **Gene** | **Tree prior** | **Substitution model** | **Result of date-randomizaton test** |
| **(subst/site/year)** |
| A | Interspecies | Fixed crown age at 10000 years (standard deviation = 1) | *Mandrillus* genus, including *Mandrillus leucophaeus poensis* (Bioko island drill) | SIV | 1.00×104 | 2.90×10-2 | 1.90×10-2 -4.99×10-2 | 9.68×103 | *POL* | Yule | GTR+I+Γ | Pass |
| B | Interspecies | Fixed crown age at a minimum divergence time of 100 years before present | *Homo sapiens* and *Cercocebus atys* | HIV-2 and SIVsmm | 1.00×102 | 1.14×10-1 | 7.32 - 1.77×101 | 1.00×102 | *POL* | Yule | GTR+I+Γ | Pass |
| C | Interspecies | Fixed crown age at a minimum divergence time of 100 years before present | *Homo sapiens* and *Cercocebus atys* | HIV-2 and SIVsmm | 1.00×102 | 2.65 | 2.05 - 3.51 | 1.00×102 | *ENV* | Yule | GTR+I+Γ | Pass |
| D | Interspecies | Fixed crown age at a minimum divergence time of 100 years before present and tip date sampling (heterochronous sampling) | *Homo sapiens* and *Pan troglodytes* | HIV-1 and SIVcpz | 1.00×102 | 4.10 | 3.23 - 5.04 | 1.00×102 | *ENV* | Multispecies coalescent | HKY+I+Γ | Pass |
| E | Interspecies | Fixed crown age at a minimum divergence time of 100 years before present and tip date sampling (heterochronous sampling) | *Homo sapiens* and *Pan troglodytes* | HIV-1 and SIVcpz | 1.00×102 | 1.43 | 1.24 - 1.63 | 1.00×102 | *POL* | Multispecies coalescent | HKY+I+Γ | Pass |
| F | Intraspecies | Tip-dates (heterochronous samples) | *Homo sapiens* | HIV-1 group M, all subtypes | 2.10×101 | 2.23 | 1.29 - 2.06 | 9.68×101 | *ENV* | Constant-size coalescent | GTR+I+Γ | Pass |
| G | Intraspecies | Tip-dates (heterochronous samples) | *Homo sapiens* | HIV-1 group M, all subtypes | 2.50×101 | 6.00×10-1 | 3.60×10-1 - 8.33 | 1.44×102 | *POL* | Constant-size coalescent | GTR+I+Γ | Pass |
| H | Intraspecies | Tip-dates (heterochronous samples) | *Homo sapiens* | HIV-1 group M, subtype A | 1.50×101 | 1.43 | 4.70×10-1 - 2.39 | 1.08×102 | *ENV* | Constant-size coalescent | GTR+I+Γ | Pass |
| I | Intraspecies | Tip-dates (heterochronous samples) | *Homo sapiens* | HIV-1 group M, subtype A | 1.30×101 | 8.16×10-1 | 2.00×10-1 - 1.44 | 1.0×102 | *POL* | Constant-size coalescent | GTR+I+Γ | Pass |
| J | Intraspecies | Tip-dates (heterochronous samples) | *Homo sapiens* | HIV-1 group M, subtype B | 1.80×101 | 4.54 | 3.50 - 5.80 | 3.70×101 | *ENV* | Constant-size coalescent | GTR+I+Γ | Pass |
| K | Intraspecies | Tip-dates (heterochronous samples) | *Homo sapiens* | HIV-1 group M, subtype B | 2.60×101 | 1.08 | 7.13×10-1 - 1.45 | 7.35×101 | *POL* | Constant-size coalescent | HKY+I+Γ | Pass |
| L | Intraspecies | Tip-dates (heterochronous samples) | *Homo sapiens* | HIV-1 group M, subtype A1 | 1.70×101 | 3.25 | 2.42 - 4.15 | 5.18×101 | *ENV* | Constant-size coalescent | GTR+I+Γ | Pass |
| M | Intraspecies | Tip-dates (heterochronous samples) | *Homo sapiens* | HIV-1 group M, subtype A1 | 2.10×101 | 1.09 | 6.00×10-1 - 1.64 | 5.56×101 | *POL* | Constant-size coalescent | GTR+I+Γ | Pass |
| N | Intraspecies | Tip-dates (heterochronous samples) | *Homo sapiens* | HIV-1 group M, subtype C (in India) | 1.70 | 6.81 | 3.30×10-3 - 1.45×101 | 1.27×101 | *ENV* | Constant-size coalescent | GTR+I+Γ | Fail |
| O | Intraspecies | Tip-dates (heterochronous samples) | *Homo sapiens* | HIV-1 group M, subtype C (in South America) | 1.50×101 | 6.40×10-1 | 3.00×10-5 - 4.43 | 4.99×101 | *POL* | Constant-size coalescent | GTR+I+Γ | Pass |
| P | Intraspecies | Tip-dates (heterochronous samples) | *Homo sapiens* | HIV-1 group M, subtype C (in South America) | 1.50×101 | 8.00 | 4.23 - 1.17×101 | 1.69×101 | *ENV* | Constant-size coalescent | GTR+I+Γ | Pass |
| Q | Intraspecies | Tip-dates (heterochronous samples) | *Homo sapiens* | HIV-2 group A | 2.30×101 | 2.90 | 1.40- 4.50 | 8.41×101 | *POL* | Constant-size coalescent | GTR+I+Γ | Pass |
| R | Intraspecies | Tip-dates (heterochronous samples) | *Homo sapiens* | HIV-2 group A | 2.50×101 | 8.50×10-1 | 3.00×10-1 - 1.48 | 1.46×102 | *ENV* | Constant-size coalescent | HKY | Pass |
| S | Intrahost | Tip-dates (heterochronous samples) | *Homo sapiens* | HIV-1 group M, subtype B | 4.20 | 2.92 | 1.70 - 4.50 | 5.80 | *GAG* | Constant-size coalescent | HKY | Fail |
| T | Intrahost | Tip-dates (heterochronous samples) | *Homo sapiens* | HIV-1 group M, subtype B | 1.10 | 5.28 | 4.20×10-1 - 1.08×101 | 1.60 | *POL* | Constant-size coalescent | HKY | Pass |
| U | Intrahost | Tip-dates (heterochronous samples) | *Homo sapiens* | HIV-1 group M, subtype B | 3.00 | 5.13 | 2.43 - 9.46 | 3.60 | *POL* | Constant-size coalescent | HKY | Pass |
| V | Intrahost | Tip-dates (heterochronous samples) | *Homo sapiens* | HIV-1 group M, subtype B | 2.60 | 1.75 | 1.06 - 2.54 | 3.30 | *ENV* | Constant-size coalescent | HKY | Pass |

aGenBank accession numbers:

(A) AF328291, AF328292, AF328293, AJ310481, AY159321, HM363426, HM363427, HM363406, HM363407, HM363408, HM363409, HM363410, HM363411, HM363412, HM363413, HM363414, HM363415, HM363416, HM363417, HM363418, HM363419, HM363420, HM363421, HM363422, HM363423, HM363424, HM363425.

(B) AAM408176, AAM408178, AAM408180, AAM408182, AEF090176, AEF611325, AEF611326, AEF611329, AFJ812543, AJQ282099, BFJ812622, BFJ812624, BGU012506, BGU012507, BGU133367, BEF090179, BEF090186, EF569684, EF569685, EF569689, EF569691, EF569695, EF569704, EF569717.

(C) AGQ485526, AGQ485527, AGQ485529, AGQ485549, AGU204945, AGU204946, BJN230730, BJN230726, BJN230729, FJ706825, FJ706812, FJ578805, FJ578804, FJ578800, FJ578786, FJ578764.

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(K) AB221126, AB480698, AB485642, AF042100, AF042106, AF086817, AF156850, AY037269, AY275557, AY314061, AY561244, AY781126, AY795905, BD130467, DQ207940, DQ358808, DQ383750, DQ396398, DQ823364, EF514708, EF637054, EU839596, EU839600, EU839605, JF320008, M26727, JQ403028, JN251896, JF683793, JF320641.

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