Supplementary Notes

Manuscript Title: L1 retrotransposition is suppressed by endogenously encoded siRNAs in human cultured cells

Here we estimate the time required to double the number of active L1 copies in the rhesus lineage compared to the human lineage, if the rate of retrotransposition decreases in the human lineage to half that of the rhesus lineage. In this calculation, we assume that the ASP became active in the human lineage after the divergence point of the human lineage and rhesus lineage about 25 Myr ago. We assume a generation time in the rhesus lineage of 10 years, and in the human lineage of 20 years. Other assumptions are that there is no degradation of elements, selection against element increase is not operating, and no form of transposition regulation is evolving.

Then a model of exponential increase seems reasonable. So, let N(t) be copy number at time t, where t is measured in generations; N(0) be set at 100 active copies; r = 0.02 is the transposition rate (proportion of elements in generation t+1 that are newly transposed in the average genome).

Then we can set the problem as

$N(t) = N(0)e^{rt}$
with r=0.01 for the human lineage, and r=0.02 for the rhesus lineage.

In 45 rhesus generations (450 years), the active L1 copy number increases from 100 to 245, while in the same time period (22.5 human generations), the active L1 copy number becomes 125 or roughly 50% that of rhesus.