**Details of all BEAST Random Local Clock analyses**

The additional BEAST analyses varied 4 parameters from the focal analysis (Analysis 1). The xml file for the focal analysis is included, so that the other analyses can be performed simply by changing these 3 elements.

The first two parameters affect the priors on the number and magnitude of rate changes. The last two variables are related only to MCMC sampling.

**Analysis 1 (focal analysis)**

* exponential prior, mean 1, on number of rate changes
* gamma prior, shape 0.5, scale 2, on relative rates
* bitflip operator weight 100
* MCMC chain length 200 million steps

**Analysis 2**

* exponential prior, mean 4, on number of rate changes
* gamma prior, shape 2, scale 0.5, on relative rates
* bitflip operator weight 15
* MCMC chain length 100 million steps

**Analysis 3**

* Poisson prior, mean 4, on number of rate changes
* Lognormal prior, mean 1, stdev 1, on relative rates
* Bitflip operator weight 15
* MCMC chain length 100 million steps

**Analysis 4**

* Poisson prior, mean 3, on number of rate changes
* Gamma prior, shape 0.5, scale 2, on relative rates
* Bitflip operator weight 15
* MCMC chain length 100 million steps

**Analysis 5**

* Poisson prior, mean 2, on number of rate changes
* Lognormal prior, mean 1, stdev 1, on relative rates
* Bitflip operator weight 40
* MCMC chain length 500 million steps; poor convergence