

Obtaining site-level dN/dS estimates with FEL

- dN/dS estimates at individual sites are not **precise**
- They are estimated from relatively small samples
- Precision improves with the number of sequences and divergence levels
- One approach to correct for this is to compute approximate site-level confidence intervals.

| Codon | Partition | alpha | beta | LRT | Selection detected? | dN/dS with confidence intervals | | |
|-------|-----------|-------|-------|--------|---------------------|---------------------------------|-------|-------|
| 2 | 1 | 1.843 | 0.000 | 7.521 | Neg. p = 0.0061 | 0.000(| 0.00- | 0.09) |
| 3 | 1 | 0.786 | 0.000 | 3.161 | Neg. p = 0.0754 | 0.000(| 0.00- | 0.16) |
| 4 | 1 | 2.174 | 0.000 | 10.742 | Neg. p = 0.0010 | 0.000(| 0.00- | 0.07) |
| 7 | 1 | 1.105 | 0.000 | 7.537 | Neg. p = 0.0060 | 0.000(| 0.00- | 0.11) |
| 8 | 1 | 0.422 | 0.000 | 3.173 | Neg. p = 0.0749 | 0.000(| 0.00- | 0.28) |
| 9 | 1 | 1.353 | 0.000 | 8.638 | Neg. p = 0.0033 | 0.000(| 0.00- | 0.08) |
| 10 | 1 | 1.353 | 0.000 | 8.369 | Neg. p = 0.0038 | 0.000(| 0.00- | 0.09) |
| ... | | | | | | | | |
| 247 | 1 | 1.353 | 0.000 | 8.088 | Neg. p = 0.0045 | 0.000(| 0.00- | 0.10) |
| 248 | 1 | 0.451 | 0.000 | 3.496 | Neg. p = 0.0615 | 0.000(| 0.00- | 0.28) |
| 249 | 1 | 0.000 | 2.700 | 7.881 | Pos. p = 0.0050 | 10000.000(7599.84-10000.00) | | |
| 250 | 1 | 0.220 | 0.000 | 2.797 | Neg. p = 0.0945 | 0.000(| 0.00- | 0.61) |
| 388 | 1 | 0.220 | 0.000 | 2.797 | Neg. p = 0.0945 | 0.000(| 0.00- | 0.61) |

hyphy fel --alignment data/WestNileVirus_NS3.fas --ci Yes