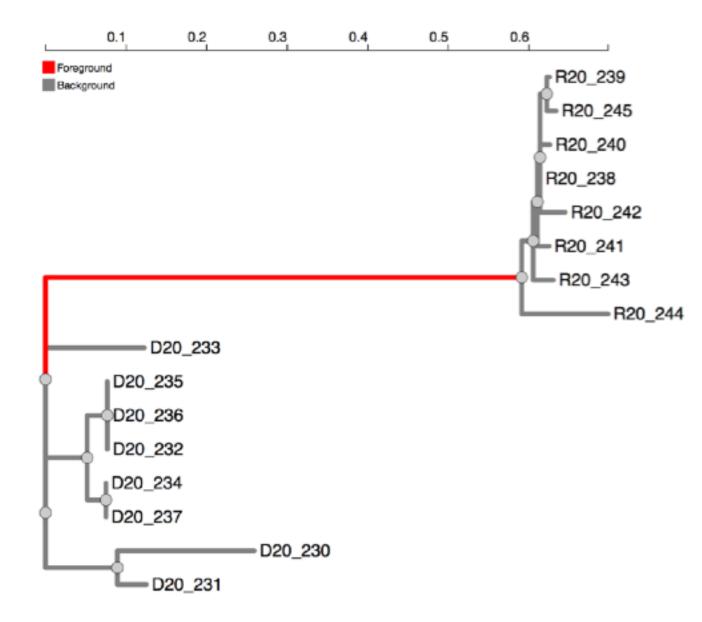


hyphy contrast-fel --alignment data/AlphaDeltaSpike.fas --tree data/AlphaDeltaSpike.tree --branch-set Alpha --branch-set Delta

Branch testing; exploratory vs a priori

- aBSREL and BUSTED can test all branches for selection (exploratory), or apply the test to a set of branches defined a priori (e.g. defining a particular biological hypothesis).
- For BUSTED, *a priori* partitioning of branches can increase power, especially if selective regimes are markedly different on different parts of the tree.
- For example, BUSTED applied to the HIV dataset where the transmission branch is designated as foreground, found a greater proportion sites under stronger selection on this branch that the rest of the tree (8% vs 1%), and a lower p-value.



| | Background | Foreground |
|---------|----------------------------|----------------------------|
| Class 1 | $\omega = 0.51$ $p = 0.08$ | $\omega = 0.00$ $p = 0.92$ |
| Class 2 | $\omega = 0.72$ $p = 0.91$ | |
| Class 3 | $\omega = 116$ $p = 0.01$ | $\omega = 510$ $p = 0.08$ |

112