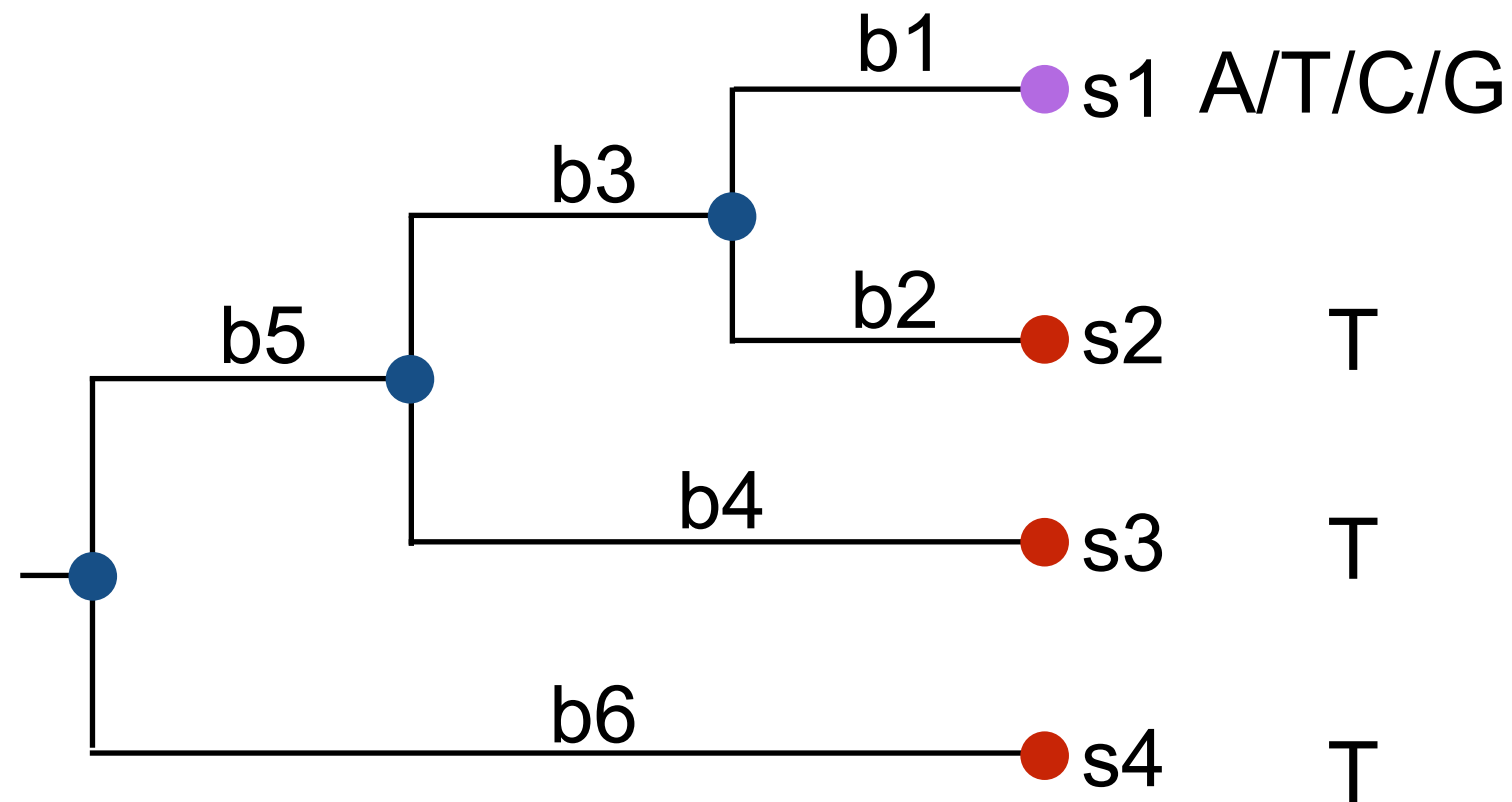


Genome-wide Detection of Sites Under Selection Using a Modified Method of Evolutionary Probability

Reporter: Hao Yuan

Evolutionary Probability (Liu, L *et al.* 2015 MBE)

Average of the posterior probability (PP) for each possible nucleotide/amino acid state at a given position in a species under neutral evolution

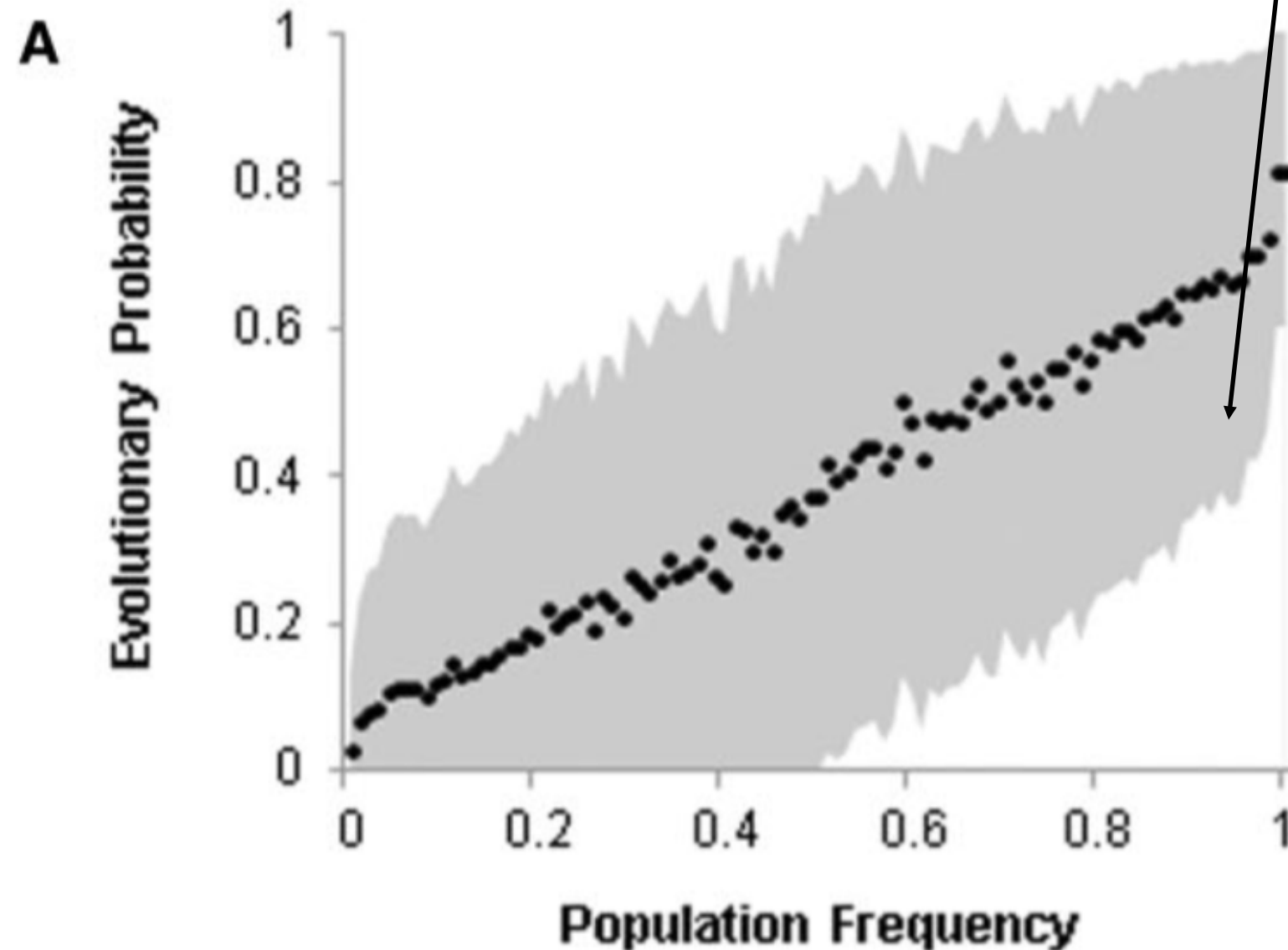


$$EP(T|Tree) \gg EP(A|Tree) = EP(G|Tree) = EP(C|Tree)$$

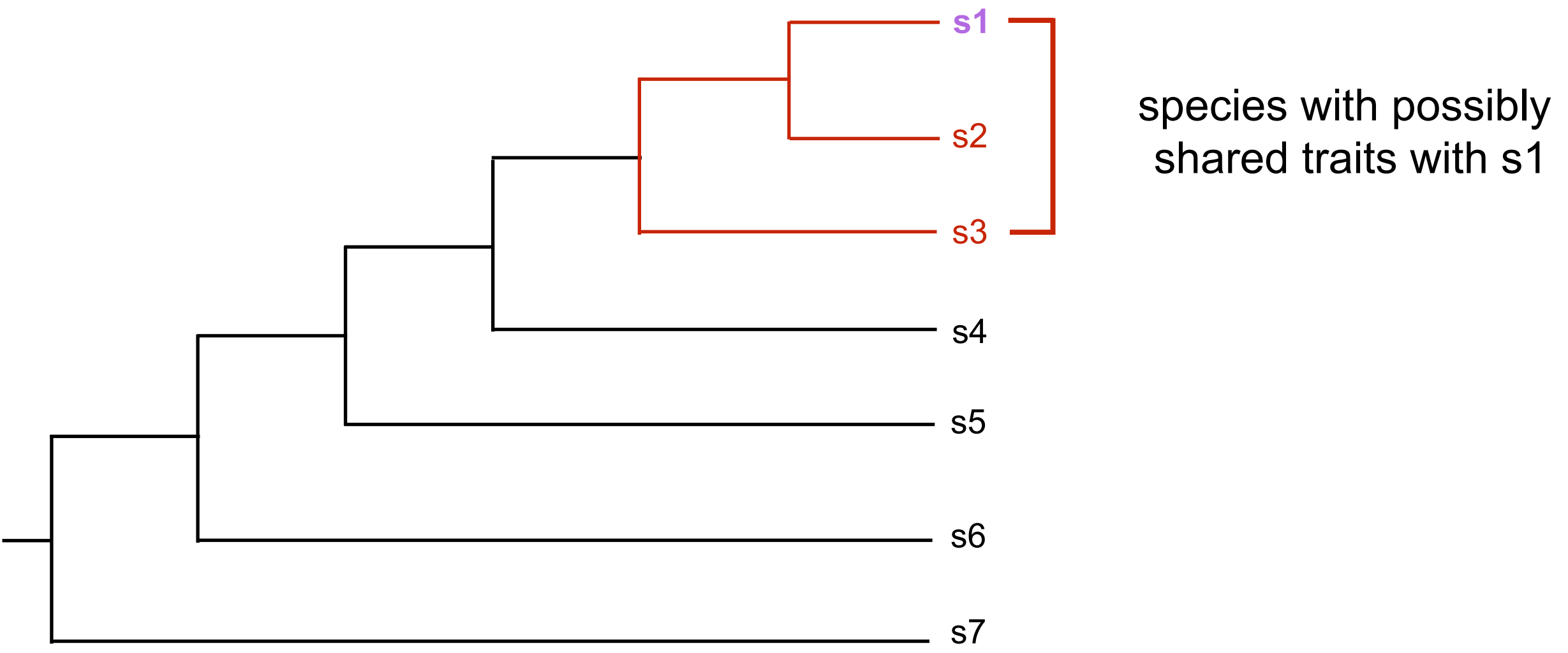
Evolutionary Probability (Liu, L *et al.* 2015 *MBE*)

Comparing EPs Versus Population Frequencies

High frequency with relatively low EP (indicates selection)

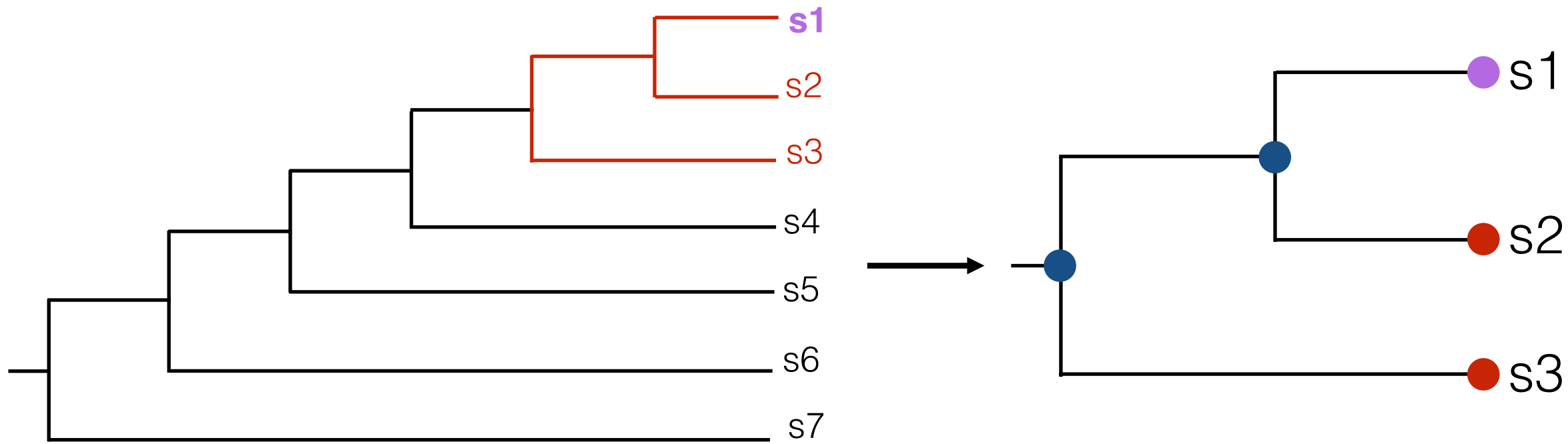


A Modified Method of EP



A Modified Method of EP

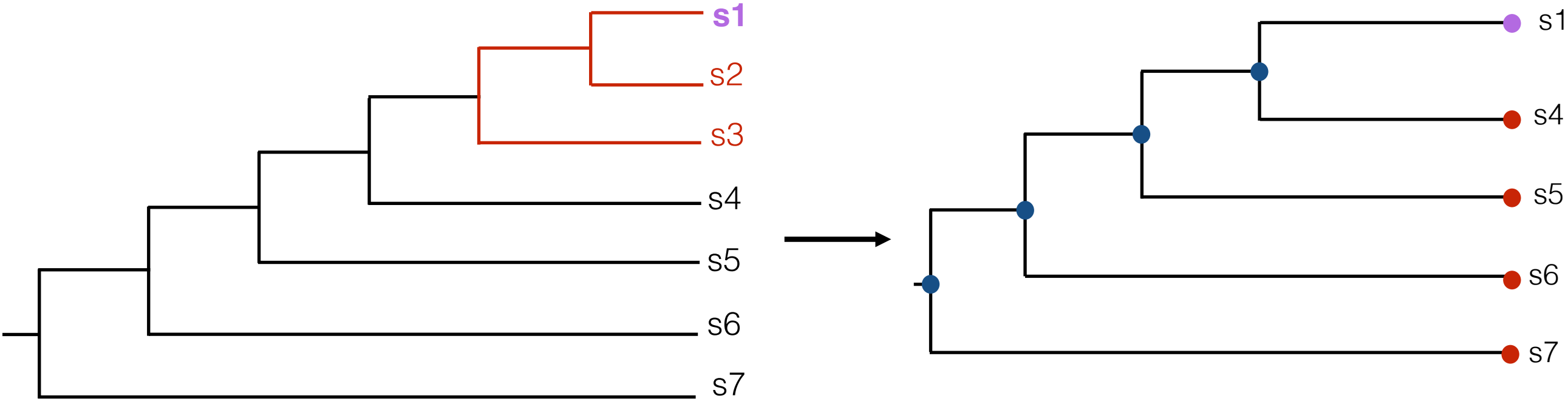
Compute evolutionary probability in partial tree consists of species with possibly shared traits $EP_s(s1)$



$EP_s(s1)$

A Modified Method of EP

Then prune the species sharing traits with s1, and compute evolutionary probability in pruned tree $EP_{ns}(s1)$

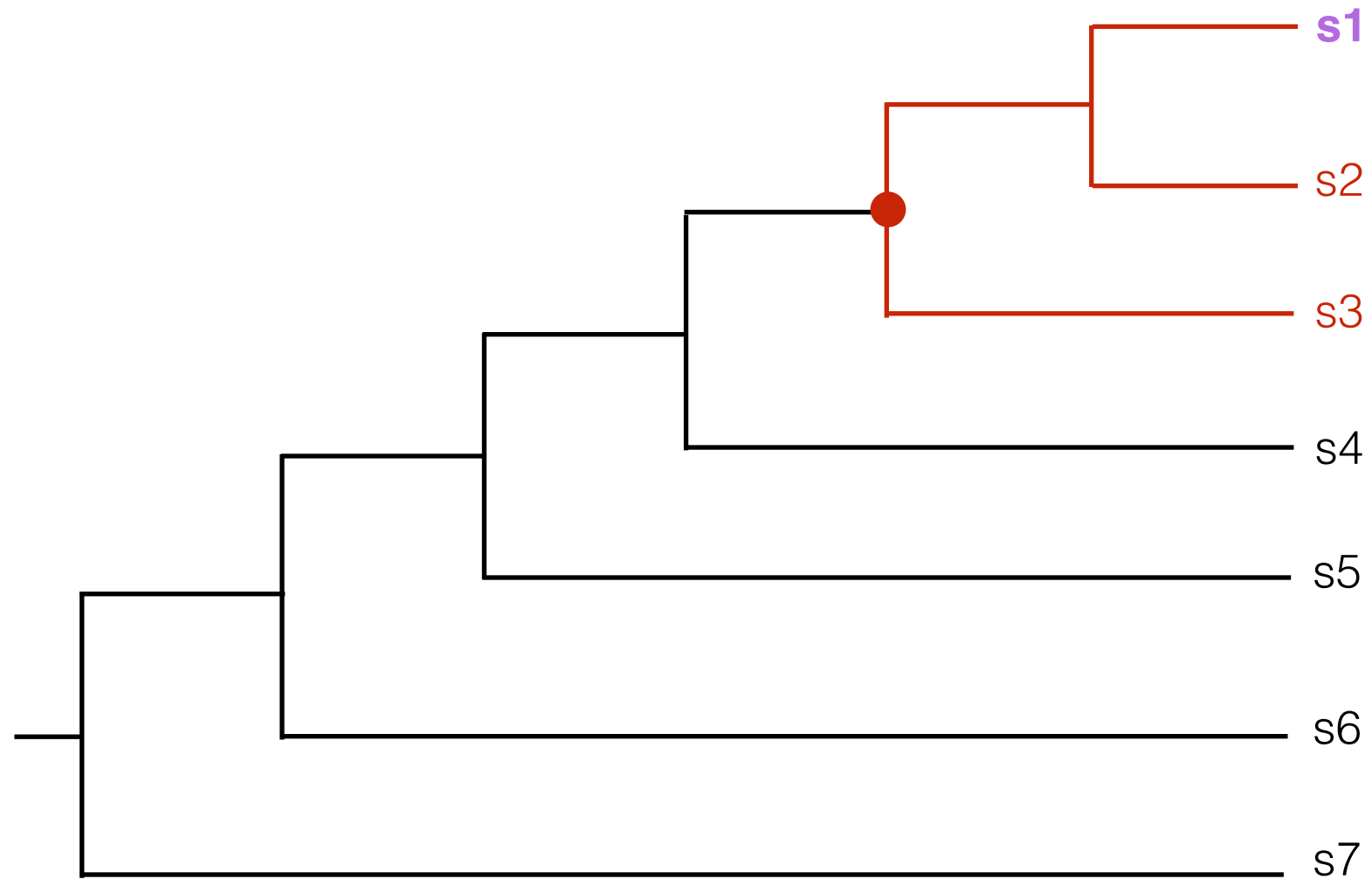


$EP_{ns}(s1)$

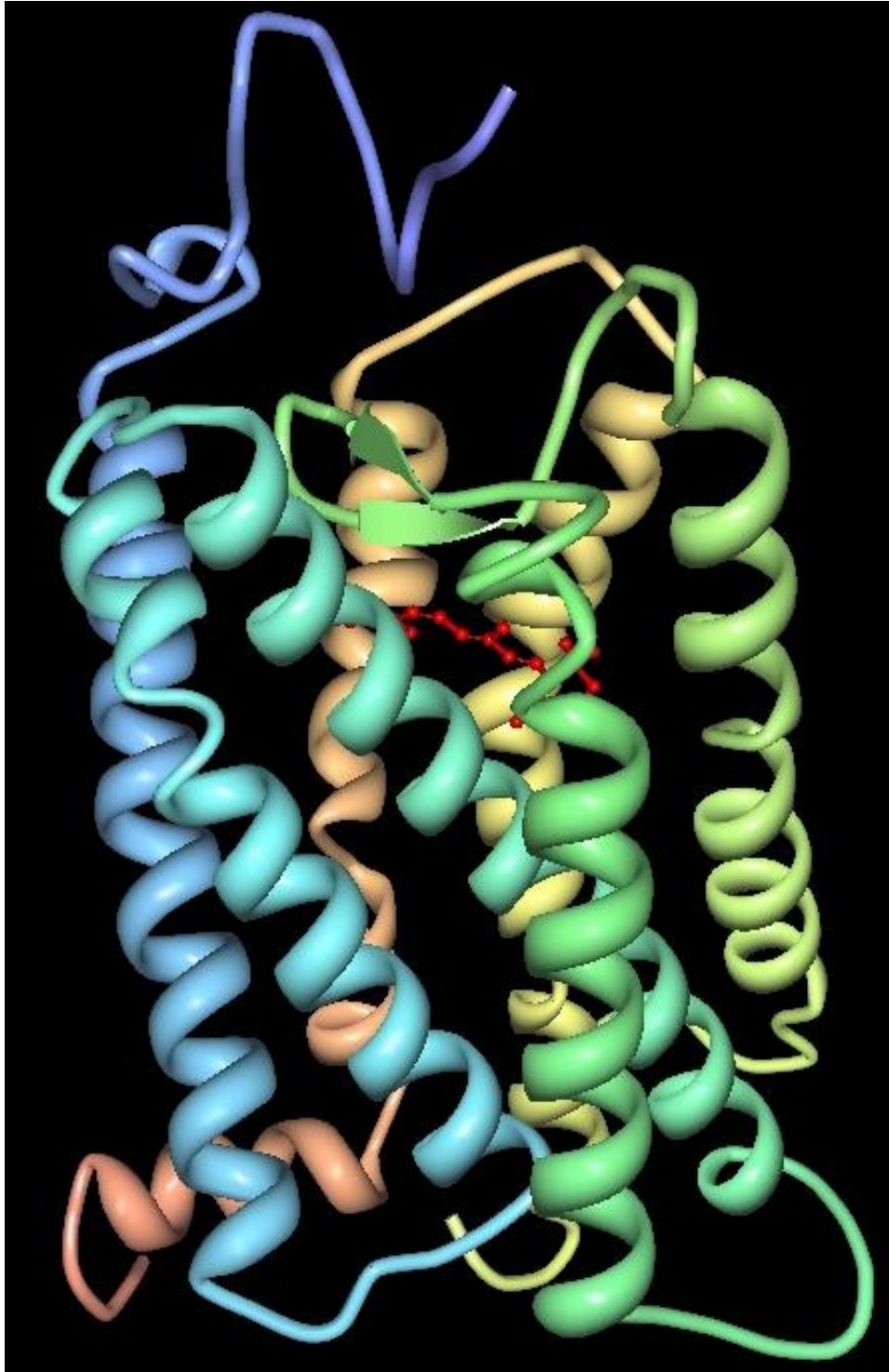
A Modified Method of EP

Divide $EPs(s1)$ by $EPns(s1)$ to get the EP ratio of s1 $EPR(s1)$

$$EPR(s1) = \frac{EPs(s1)}{EPns(s1)}$$



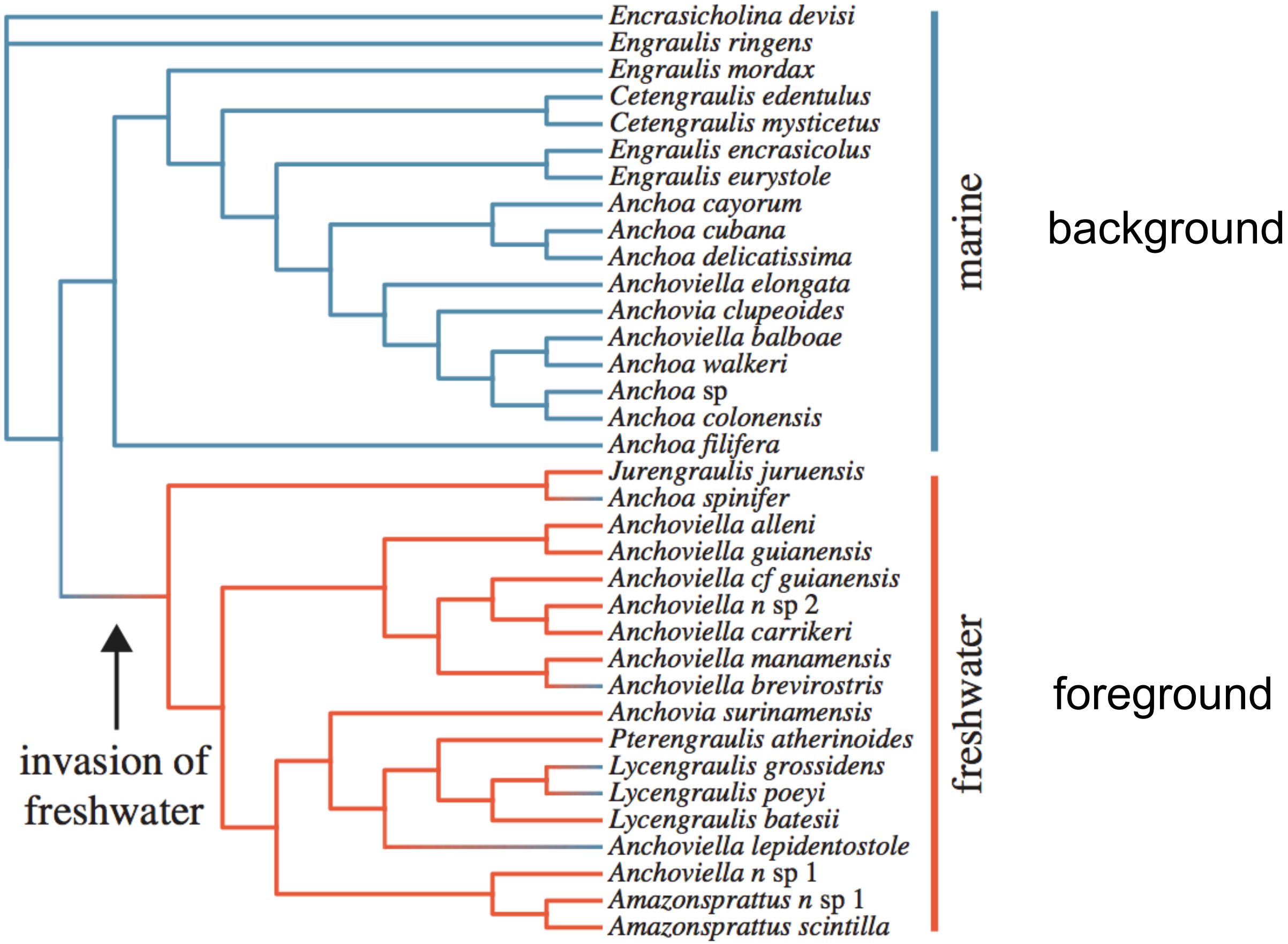
Results (Rhodopsin)



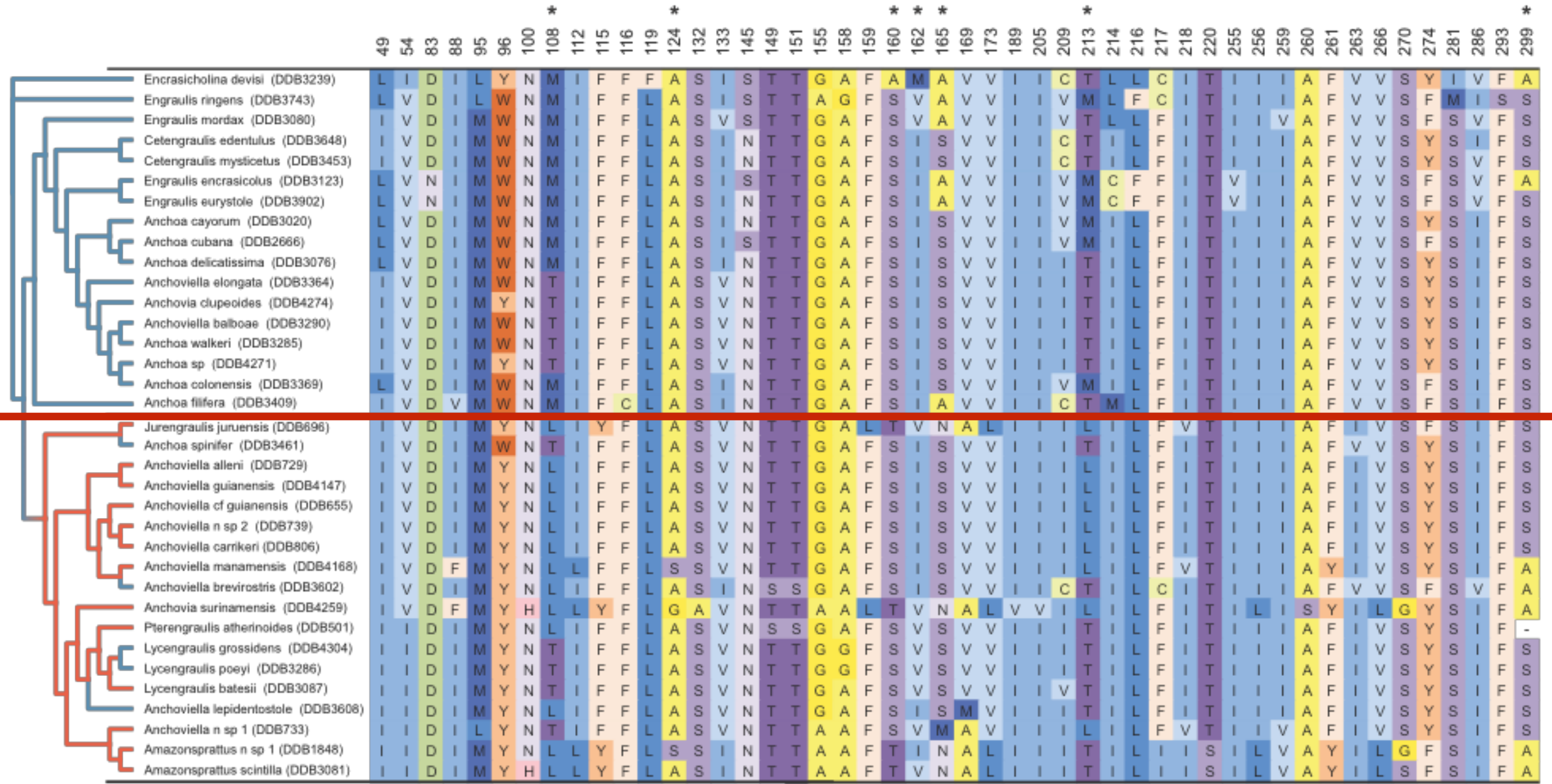
Rhodopsin is a biological pigment found in the rods of the retina

Rhodopsin is extremely sensitive to light, and thus enables vision in low-light conditions

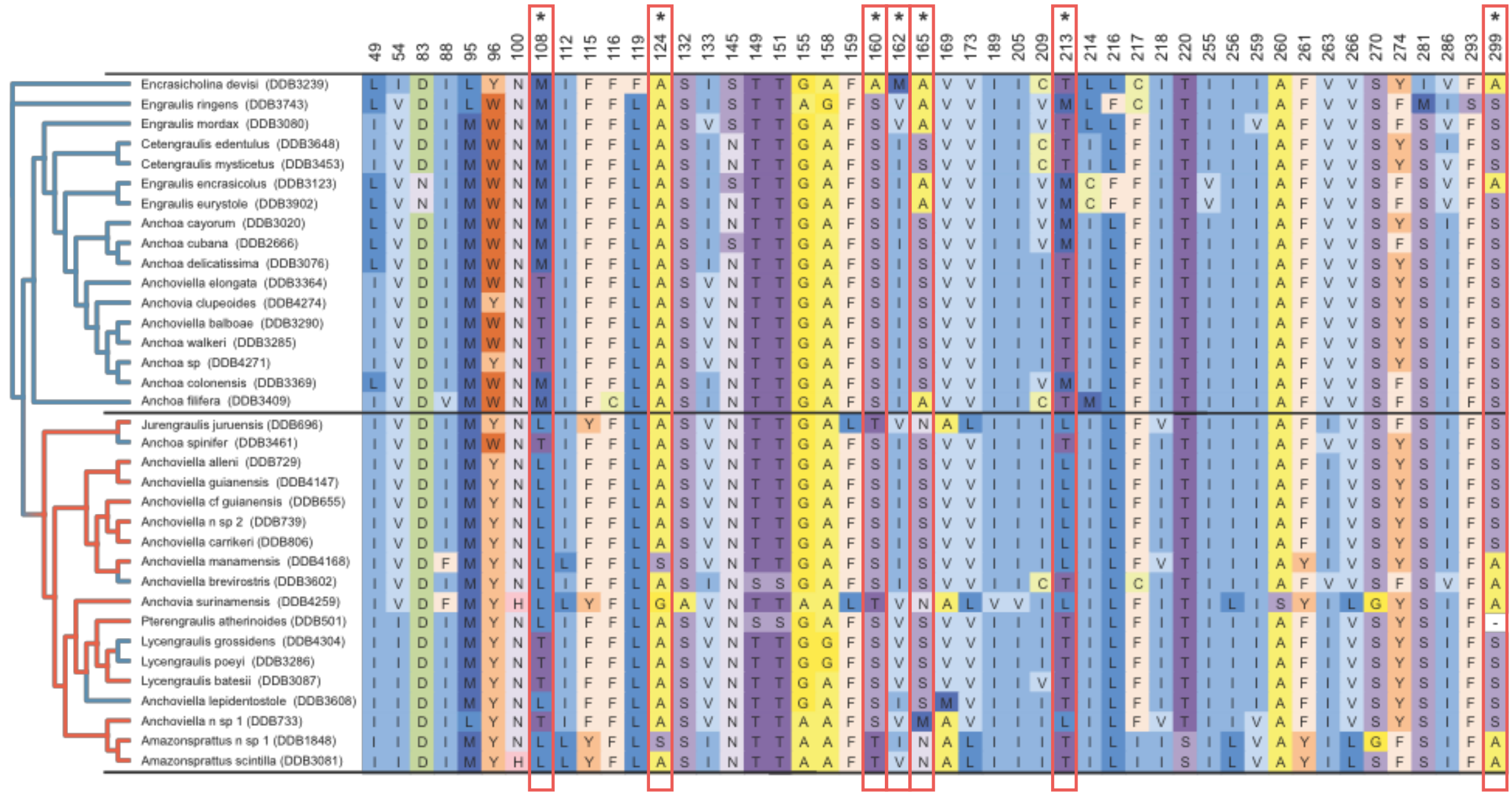
Results (Rhodopsin)



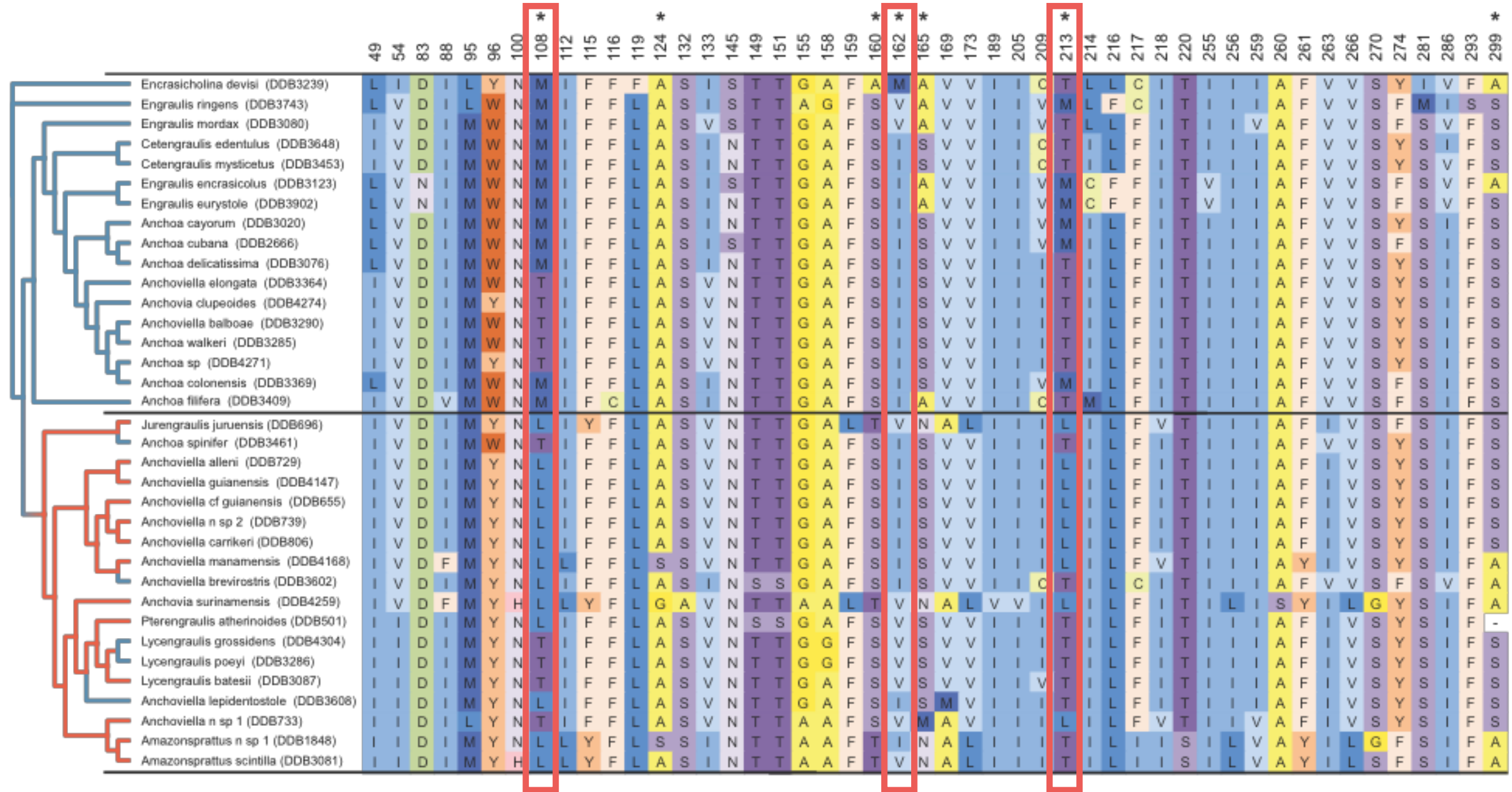
Results (Rhodopsin)



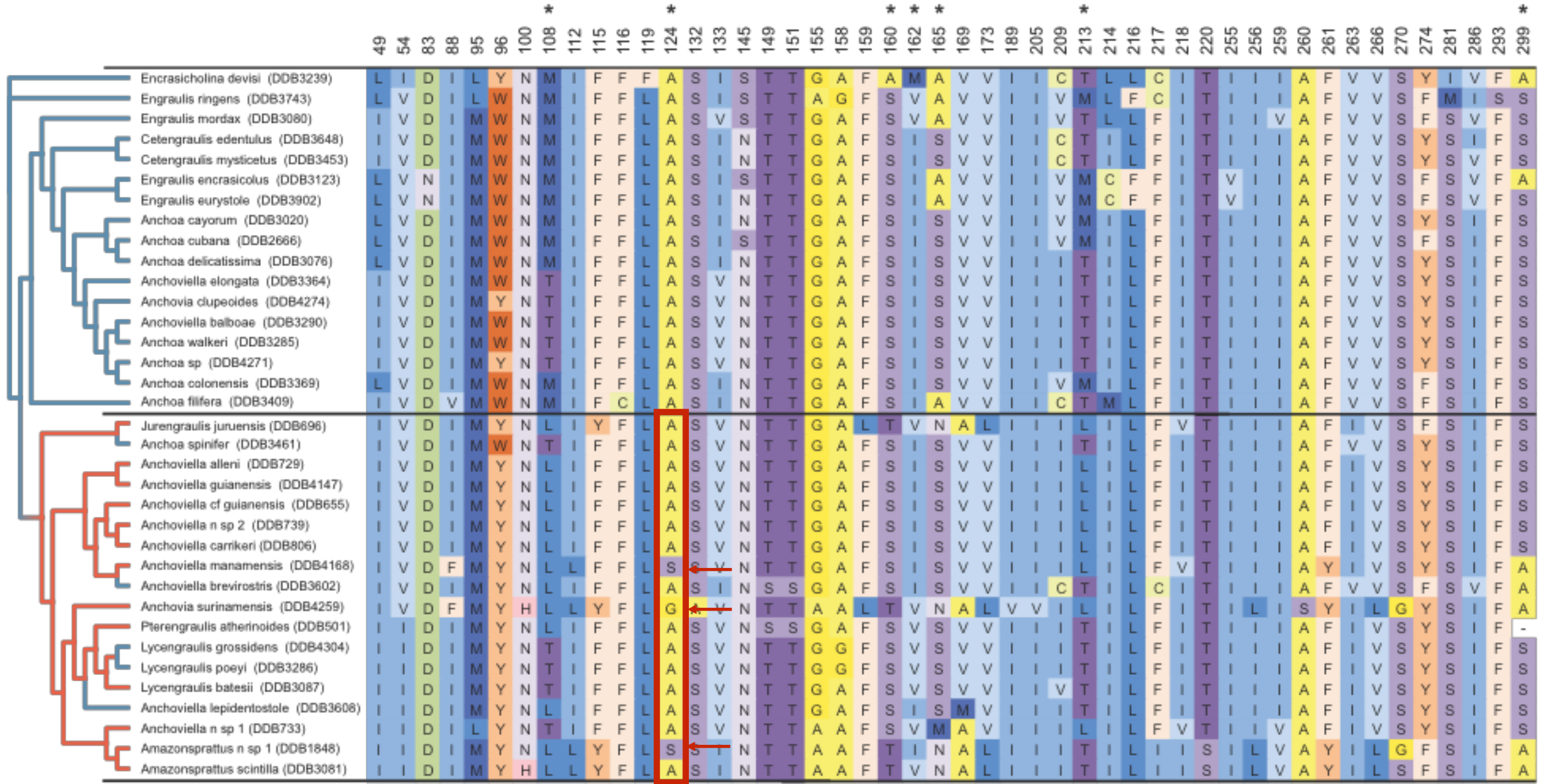
Results (Rhodopsin)



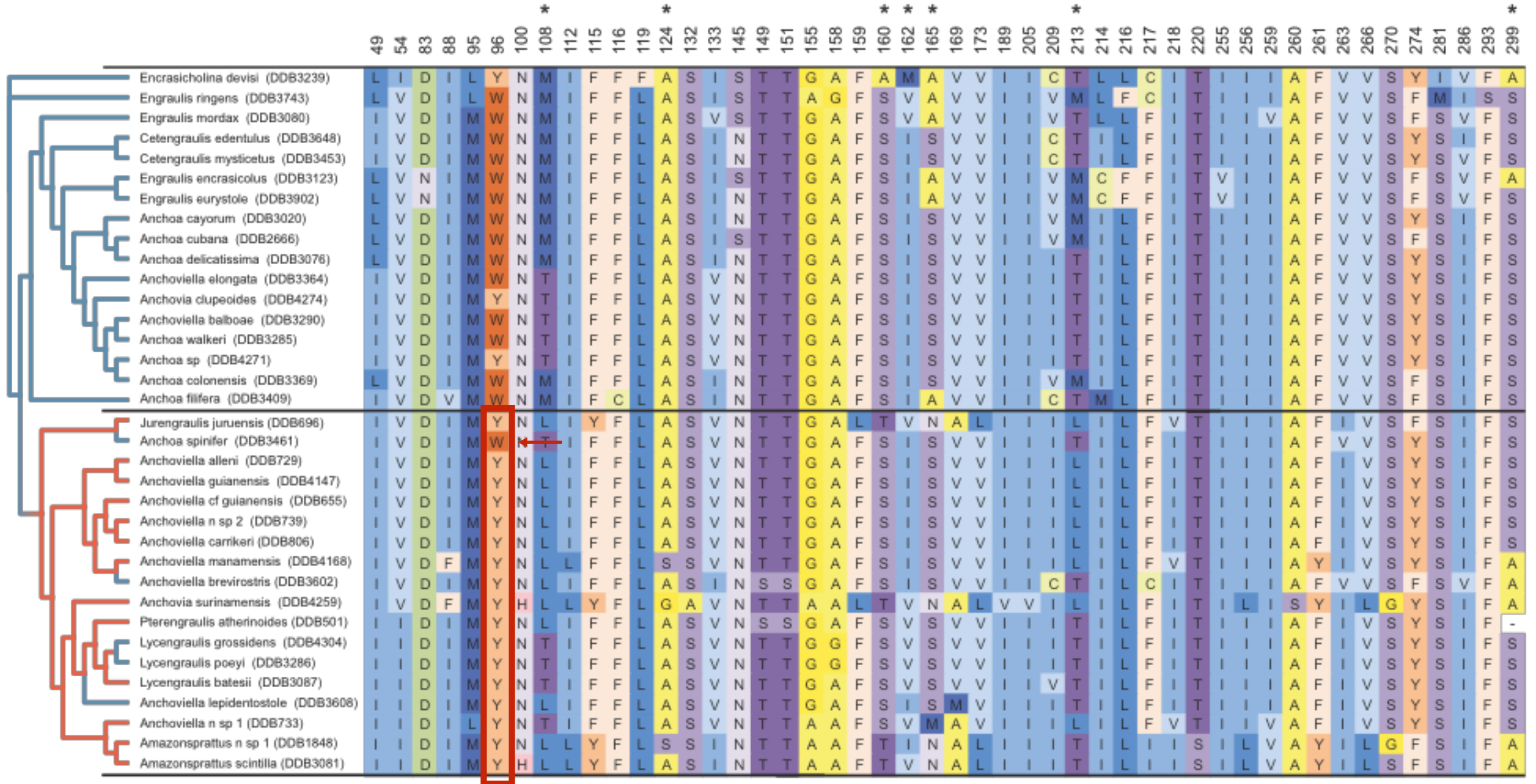
Results (Rhodopsin)



Results (Rhodopsin)



Results (Rhodopsin)



Thanks