**Questions**

1. Clarification on the species in the alignment (cots, zebra)
2. Are these ORs in these other species or selected GPCRs
3. Better understanding indicators of evolution – how can we relate mutations in this sequence to evolutionary events
4. Better familiarity with how these species are found on a phylogenetic tree with humans (zebrafish = vertebrates) 🡪 zebra fish is the most similar to the mammalian OR set

**Findings**

CWL motif is common to GPCRs

Found CY in human ORs

CY also found in anemone, cots, zebrafish, and urchins

CW found in zebrafish and urchins

Other combinations of cysteine and a residue are found in

CW 🡪 CY 🡪 FY 🡪 FF, FS, HY

Hypothesis of how the motif evolved – take a mammal OR and play with the motif 🡪 FYG replace what? Then replacing what? Find this **path**

Same thing for **MAYDRY**

OR **origination**

* Class 1 and class 2
* Class 1 is fish derived
* Class 2 is amphibian derived (larger repertoire of more airborne odorants)

Find that these OR like sequences from other species are more similar to template GPCRs than they are from ORs in mammals? 🡪

**Phylogenetic** modeling uses bootstrapping to 🡪 read basic page of phylogenetics

Afraid of overengineering

In generating the **CSV** – have the names of the names of the ORs concatenated with comma sepearting the strings

**Subset** all zebrafish receptors 🡪 ran file with same prompt what does it look like?

Input arg with species (grep, Linux search will help with subsetting)

**One fastA file for each species 🡪 species specific motif to test**