EEOB 563 Final Project

**Estimating divergence dates of sponges using fossil records of primates mitochondrial rRNA sequence under different evolutionary models**

(This is a super-unfinished drafty draft, more like an outline of the project)

**Introduction**

-Researches have shown that mitochondria provide insight of studying the evolution of life. Several mitochondrial sequences such as rRNA are shown to be well conserved throughout different species.

-Fossil records or primates have been well studied. Meanwhile, due to the biology and living conditions, fossil records of sponges was rarely discovered or studied.

-In this project, my goal is to apply the molecular clock methods to estimate the divergence time of sponges based on the given studies of primates.

-Challenges will be choosing the best number of sequences to build the tree and choosing the best model.

-The tree construction is primarily done using BEAST, while other software including MrBayes and PAML will be used for calculating the marginal likelihood for model comparisons

**Methods**

All the mitochondrial rRNA sequences were obtained from GenBank. The fossil records of the primates were summarized based on the previous publications. Sequences were aligned using software Mafft. BEAST 2 was used for generating the time-scaled phylogenetic trees. MrBayes and PAML will be used for calculating the marginal likelihood for model comparisons.

**Results** (Primary, more updates coming very soon)

