1. Introduction
   1. Background info about Lamiaceae
      1. Contains many species with medicinal/flavor/fragrance uses
      2. Mint Evolutionary Genomics Consortium, 2018
   2. *Scutellaria baicalensis* is a well-known species within Lamiaceae
      1. Root extracts used in eastern medicine
      2. Evolved a unique biosynthetic pathway responsible for producing a variety of medicinally relevant flavonoids
         1. List specific flavonoids and their medicinal effects
         2. Accumulation pattern – distinction between root and shoot flavonoids
      3. Reference genome recently published
   3. Gaps in knowledge – the *Scutellaria* genus contains >470 species
      1. Distributed across the Americas and Asia
      2. Some have been studied – *S. barbata, S. lateriflora*
         1. Results of these studies indicate flavonoid diversity relative to *S. baicalensis*
      3. Many species have not been studied at all
         1. Unknown if flavonoid pathway and resulting pattern of accumulation is conserved
   4. Goals of study
      1. Chemically assay a large subset of Scutellaria species to identify those accumulating high concentrations of medicinally relevant flavonoids
      2. Combine chemical and phylogenetic data to provide insight into the evolutionary history of flavonoid diversity, and identify "medicinal hotspots" in the genus
      3. Perform organ-specific chemical profiling to determine differences in site of flavonoid accumulation across multiple species
      4. Compare organ-specific flavonoid profiles against *S. baicalensis* to evaluate whether proposed biosynthetic pathway holds true for other species
      5. Estimate genome sizes to determine ease of biotech …
2. Methods
   1. Selected subset of species to investigate
   2. Phylogenetic tree constructed from chloroplast genomes
   3. Targeted metabolite profiling with HPLC
      1. Non-organ specific
      2. Organ-specific
   4. Hierarchical clustering of species and flavonoids based on concentration
   5. Flow cytometry to estimate genome sizes
3. Results