**Presenters: Steve Rossiter and Susan Tsang;**

**Title: The Role of Genetic Data**

* History of sequencing: Sanger and grow into human genome project and project on other mammals
* Growth of next generation sequencing, short gun sequencing.
* DNA techniques
* Why we use DNA for genetic analysis
  + Sequencing for phylogenetic and phylogeogrpahic analysis
  + Species ID
  + Functional gene
* Advantage of DNA
  + Relatively stable
  + Evenly distributed across all cells (same result from muscle versus wing versus liver)
  + Advantages of using introns
* Disadvantages of DNA
  + Introns and intergenic areas can make primer design difficult
  + Exonic
* Advantages of RNA
  + Can determine expression in different tissue types
  + No introns of intergenic regions, so get more gene sequence per dollar
* Disadvantages of RNA
* Degrades rapidly
* Need more material to get enough
* Need multiple tissue to obtain all genes
* For amplification, need to convert to DNA first

Tissue preservation methods:

RNA later – protect RNA and depends on the storage room and the lower temp we store can allow us to preserve even longer

100% or 70 % ethanol – Aim as high ethanol as possible, usually for specimen they tend to use for specimen

Formalin – hard to work with

IMS-, VTM-, DMSO-, Liquid nitrogen, Dry Ice, Tissue lysis buffer, AllProtect, Silica Gel, Freezing (-20), Freezing (-80)

Labeling tubes: try not to include the label inside the sample, write with pencil

Phylogenetic complexity:

1. Incomplete lineage sorting
2. Long branch attraction
3. Introgression
4. Homoplasy
5. Adaptive convergence