Taxonomic Classifications

Domains

- Bacteria: Prokaryotic cells, lack a nucleus and any other membrane bound organelles, usually have circular DNA with no associated histone/ Most ancient lineages of bacterium are heat loving thermophiles, thought to indicate that life may have begun in environments with high temps.
- Archea: Prokaryotic cells, again with circular DNA, usually no associated histone but sometimes can be. Uniquely structured membrane lipids found in no other organisms.
- Eukaryotes: Membrane bound cells which possess many organelles, have DNA enclosed within a nucleus and DNA is associated with histone protein.

Kingdoms

- Bacteria: Only one kingdom of Bacteria; however many phyla exist. There is still a huge diversity however and common traits can be seen across Phyla, thought this is due to gene transfer abilities of bacterial cells.
  Some early species were capable of photosynthesis so thought some early bacterial cells would have contained simple photosynthetic machinery.
- Archea: 2 main kingdoms
  1. Crenarchaeota – contain oldest lineages, many still depend on Sulphur or high temperature to survive and are classed as extremophiles, again suggests that early life began in hot environments.
  2. Eukarchaeota – found in more mixed conditions but most still live in extreme conditions such as halophiles (high salt)
- Eukaryotes: 5 main kingdoms
  1. Protoctista – any single celled eukaryotic organism or multicellular organism that is not classed as either plant, animal, fungi or archezoa. Huge species diversity, all will at some point in their life cycle possess a flagellum (structure & function of which is unique to protoctista)
  2. Archezoa – contain oldest lineages of eukaryotes, thought they branched off before fusion with mitochondria and so do not possess them.
  3. Plantae – multicellular eukaryotic autotrophs that dwell on land and develop from an embryo.
     Cells are non-motile and possess cellulose cell walls, vacuoles & plasmids. Cell alternates between multicellular haploid & diploid generations.
  4. Fungi – Multicellular or coenocyte heterotrophs which diversified mainly on land.
     Usually filamentous and have rigid cell walls composed of chiton.
     Feed by absorption and reproduce via spores, most of their life cycle is haploid.