

Ch 28

The Origins of Eukaryotic Diversity

*Introduction to Protists
Systematics and Phylogeny*

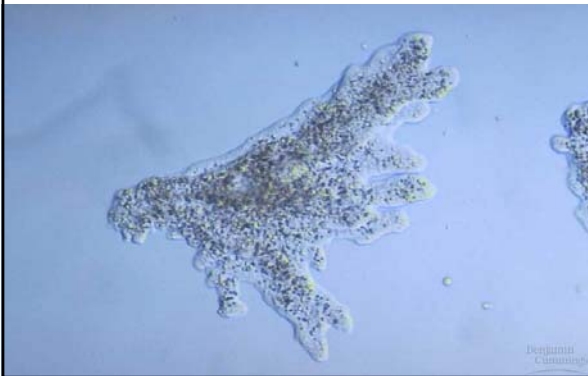
AP Biology
Mrs. King



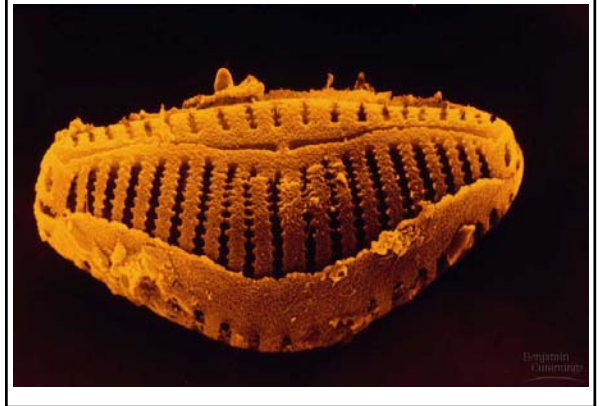
Most diverse of the eukaryotes

- 60,000 representative
- Most are unicellular
- Most are aerobic
- Photoautotrophic, heterotrophic and **mixotrophic forms**
- Most have cilia, flagella or pseudopods

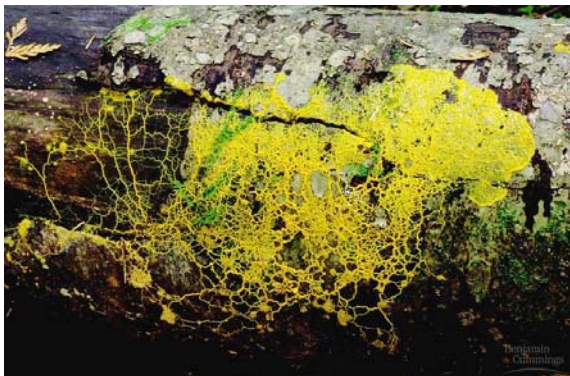
Amoeba proteus, a unicellular "protozoan"



diatom, a unicellular "alga"



a slime mold (*Physarum polychalum*)



Australian bull kelp (*Durvillea potatorum*)



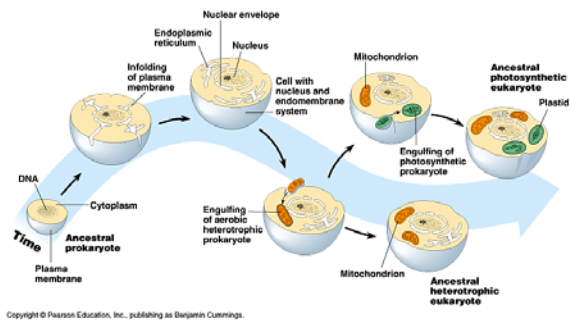
Kelp forest



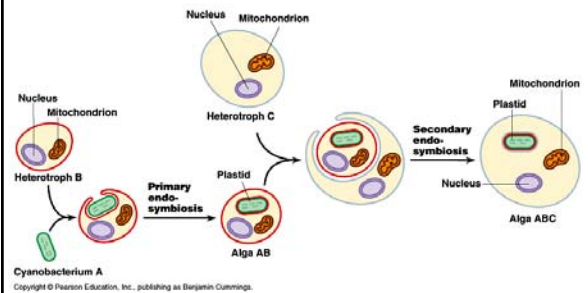
Genesis of Eukaryotes: Serial Endosymbiosis

- Membrane-bound nucleus
- Mitochondria, chloroplasts, and the endomembrane system
- Cytoskeleton
- 9 + 2 flagella
- Multiple chromosomes
- Mitosis, meiosis, and sex

The Origin of Eukaryotes



Secondary Endosymbiosis



Systematics and Phylogeny

- Grouped in *clades* (evolutionary branches)
- Based on cell structure, life cycles, and molecular composition
- Problems with kingdom concept

Older Model-Kingdom Protista

Does not really explain the probable evolutionary events

- Divided into:
 - Protozoans
 - animal like protists; heterotrophic forms; move by cilia, flagella, and pseudopods;
 - Algae
 - plant-like forms, photosynthetic, unicellular, multicellular, and colonial forms
 - Water molds and Slime molds
 - fungus like; decomposers

Major Clades

- Diplomonadida and Parabasala-*no mitochondria*
- Euglenozoa-*have flagella*
- Alveolata- *have alveoli, dinoflagellates*
- Stramenophila- *"hairy" flagella in sex cells*
- Rhodophyta-*contain phycoerythrin*
- Chlorophyta-*green algae, volvox,*
- Mycetozoa-*slime molds, decomposers*

Tentative Phylogeny of the Eukaryotes

