**Chapter 12**

**Eukaryotic Organisms**

**General Characteristics of Eukaryotic Organisms**

* Five major groups
	+ Protozoa
	+ Fungi
	+ Algae
	+ Water molds
	+ Slime molds
* Include both human pathogens and organisms vital for human life

**Protozoa**

* Diverse group defined by three characteristics
	+ Eukaryotic
	+ Unicellular
	+ Lack a cell wall
* Motile by means of cilia, flagella, and/or pseudopodia (except subgroup, apicomplexans)
	+ Require moist environments
	+ Most live worldwide in ponds, streams, lakes, and oceans; critical members of plankton
	+ Others live in moist soil, beach sand, and decaying organic matter
	+ Very few are pathogens
* **Nutrition of Protozoa**
	+ Most are chemoheterotrophic
	+ Obtain nutrients by phagocytizing bacteria, decaying organic matter, other protozoa, or the tissues of host
	+ Few absorb nutrients from surrounding water
	+ Dinoflagellates and euglenoids are photoautrophic
* **Reproduction in Protozoa**
	+ Most reproduce asexually only (binary fission or schizogony)
	+ Few also have sexual reproduction

**Protists**

* Plasmodium causes malaria-look for ring form INSIDE RBC
* Trypanosoma-causes African Sleeping Sickness.. NO form inside RBC
* Entamoeba – cause amoebic dysentery—look for “fried egg”

**Fungi**

* Chemoheterotrophic
* Have cell walls typically composed of chitin
* Lack chlorophyll; do not perform photosynthesis
* Related to animals
* **The Significance of Fungi**
	+ Decompose dead organisms and recycle their nutrients
	+ Form associations with roots of vascular plants, which help plants absorb water and minerals
	+ Used for food, in religious ceremonies, and in manufacture of foods and beverages
	+ Produce antibiotics
	+ Serve as important research tools
	+ 30% cause diseases of plants, animals, and humans
	+ Can spoil fruit, pickles, jams, and jellies
* **Nutrition of Fungi**
	+ Acquire nutrients by absorption
	+ Most are saprobes
	+ Some trap and kill microscopic soil-dwelling nematodes
	+ Most are aerobic; some are anaerobic; many yeasts are facultative anaerobes
* **Reproduction in Fungi**
	+ All have some means of asexual reproduction involving mitosis and cytokinesis
	+ Most also reproduce sexually
	+ Budding and asexual spore formation
* **Classification of Fungi**
	+ **Division based on sexual spores formed**
	+ Division Zygomycota
		- *Rhizopus* (black bread mold)
	+ Division Ascomycota (cup fungi)
		- *Penicillium* (look like hand and fingers)
		- *Aspergillus* (casuses aspergillosis)
		- *Peziza*
			* spores along cup—8 ascospores in an ascus—look like pease in a pod
	+ Division Basidiomycota
		- *Coprinus* (mushrooms)
			* look for spores on gill slits
	+ Deuteromycetes
		- Heterogeneous collection of fungi whose sexual stages are unknown
		- rRNA analysis revealed that most deuteromycetes belong in the division Ascomycota
* **Lichens**
	+ Partnerships between fungi and photosynthetic microbes (green algae or cyanobacteria)
	+ Abundant throughout the world, particularly in pristine habitats
	+ Grow on soil, rocks, leaves, tree bark, other lichens, and even on backs of tortoises, in almost every habitat
	+ Occur in three basic shapes – fruticose, crusts, foliose

**Parasitic Helminths and Vectors**

* Parasitic worms have microscopic infective and diagnostic stages – usually eggs or larvae
* Arthropod vectors are animals that carry pathogens
	+ Mechanical vectors
	+ Biological vectors
* Disease vectors belong to two classes of arthropod
	+ *Arachnida*
	+ *Insecta*
* 2 basic phylum—Nematoda and Platyhelminthes
	+ Plathyhelminthes (flat worms)
		- Taenia (tapeworm)—look for the 3-4 cross sections
			* know scolex, proglottids and gravid proglottids
		- Fasciola (sheep’s liver fluke)-looks like large leaf
		- Clinorchis (Chinese liver fluke)-looks like Fasciola except MUCH smaller
	+ Nematodes (round worms)
		- Enterobius (pinworm)
		- Ascaris (look for mounts)
		- Necator (new world hookworm)—look for hooks in mouth
		- Trichinella (causes trichinosis)—look for spirals in muscle