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BIOM 428.01: General Parasitology Laboratory

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BIOM 428 General Parasitology Laboratory Schedule

Fall Semester 2020.

Instructor Dr. Jim Driver. ISB 017. (jim.driver@mso.umt.edu)
Teaching Assistant John Sargeant (john.sargeant@umconnect.umt.edu)

Lab Time: Tu, Th 9:10-11 AM, Room: HS 404

Textbook: L.S. Roberts and J. Janovy. 2013. Foundations of Parasitology, 9th edition. It is recommended that you bring this book to lab each week. You can purchase or rent this textbook from Amazon for a reasonable price. The textbook is used for understanding the life cycles of the parasites we will study.

Covid-19 Health and Safety. We will be following the University guidelines for Covid-19 in this lab. Please do your best to prevent the spread of the virus by wearing a mask and gloves while in this lab. We will be sharing samples and slides during lab so glove use will be necessary. Also make sure you clean your lab counter space and your microscope before each class. Cleaning protocols will be covered during our first meeting. In this class it may be convenient to share a microscope for some of the samples. If you do share an image with a lab partner please make sure you clean the scope surfaces before and after each use. Fun fact: viruses can be transmitted thru your tear ducts. That is why you can get a cold or flu by rubbing your eyes. I hope that if we are diligent about the Covid guidelines we can get thru the entire lab without any community spread.

Learning Outcomes:

1. Students will become familiar with and skilled at the care and use of the light microscope to observe both fixed and stained slides and live specimens. Students will become proficient in handling, mounting, and observing both live and preserved parasite specimens.
2. Students will observe and identify parasites and the various life stages that are found in their hosts including in human tissues.
3. Students will learn to identify Protozoan, Platyhelminthes (Flatworm) and Nematode (Roundworm) parasites with an emphasis on those causing human disease and those of veterinary importance.
4. Students will observe and identify a variety of Arthropod and Crustacean vectors of parasites with a focus on vectors of human diseases.

Lab Manual: Will be distributed during lab period. a loose-leaf notebook and drawing paper will be very useful).

Lab tests: Three lab practical exams. Each will cover approximately one-third of the semester's topics. (See Lab Topics for subjects and organisms to be covered by each practical.)

Grades for this course will be based on 3 Lab Practical Exams (100 points each) and Class Participation (30 points). The following grading scheme will be used:

100-90% = A, 89.9-80% = B, 79.9-70% = C, 69.9-60% = D, <60% = F

Lab Topics, Dates, and Additional Learning Outcomes for the Laboratory class.

Aug 20 No Lab

Aug 25 No Lab

August 27. General information; check-in, use of microscopes; survey of parasites (Powerpoint presentation). Goals, scope and expectations of class will be explained.

September 1 LAB 1 - Symbiosis: mutualism - termite flagellates, endocommensalism - *Opalina* in frogs, endoparasitism - *Tritrichomonas* in mice. Observe, diagram and describe the 3 types of symbiotic relationships and be able to give an example of each.

Sept. 3 LAB 2 - Phylum Apicomplexa: gregarines, *Eimeria*, *Toxoplasma*. Observe, diagram and be able to recognize the life cycle stages of insect gregarines, Eimerian parasites and *Toxoplasma*, and be able to diagram their biology.

Sept. 8 LAB 3 and 4 - Phylum Apicomplexa (continued): malaria. Observe, diagram and be able to recognize the life cycle stages of the 4 human-infecting species of *Plasmodium*, and be able to diagram their biology (continued into next lab).

Sept. 10 LAB 3 and 4 - Phylum Apicomplexa (continued): malaria, *Babesia*. Continue with goals from previous lab and also observe, diagram and be able to recognize the life cycle stages of *Babesia*, and be able to diagram its biology.

Sept. 15 LAB 5 - Phylum Zoomastigina, hemoflagellates: *Trypanosoma* including living insect stages, *Leishmania*. Observe, diagram and be able to recognize the life cycle stages of common *Trypanosoma* and leishmanial parasites including their living insect stages, and be able to diagram their biology.

Sept. 17 LAB 6 - Phylum Zoomastigina, intestinal flagellates: *Giardia*, *Trichomonas*, *Chilomastix*. Observe, diagram and be able to recognize the life cycle stages of the common intestinal flagellates of humans, and be able to diagram their biology.

Sept. 22 LAB 7 - Phylum Sarcodina: *Entamoeba* and related genera; Phylum Ciliophora: *Balantidium*; Phylum Myxozoa: *Myxosoma*. Observe, diagram and be able to recognize the life cycle stages of the common intestinal amebic and ciliates parasites of humans, and be able to diagram their biology; be able to recognize a common myxozoan of fish.

September 24 - Laboratory Exam I: Protozoa

Sept. 29 LAB 8 - Phylum Platyhelminthes, trematodes: monogenetic trematodes and *Aspidogaster*, digenetic trematode larval stages - miracidia, sporocysts and rediae. Observe, diagram and be able to recognize the life cycle stages of common fish monogenes, molluscan aspidogasters and digenetic larval stages (continued in next lab).

Oct. 1 LAB 9 and 10 - Phylum Platyhelminthes, trematodes (continued): digenetic trematode larval stages - living cercariae, cercarial types, metacercariae; adult digenetic trematodes - *Schistosoma*. Continue learning digenetic larval stages as well as the adult stages of 3 human-infecting schistosome species.

Oct. 6 LAB 9 and 10 - Phylum Platyhelminthes, trematodes (continued): digenetic trematode larval stages - living cercariae, cercarial types, metacercariae; adult digenetic trematodes - *Schistosoma*. Continue with learning objectives of previous lab and be able to diagram the life cycles of the 3 human-infecting schistosome species.

Oct. 8 LAB 11 - Phylum Platyhelminthes, trematodes (continued): adult digenetic trematodes (continued) - *Echinostoma*, *Fasciola*, *Opisthorchis*, *Heterophyes*. Observe and diagram the adult stages of common lung, liver and intestinal flukes, and be able to diagram their biology.

Oct. 13 LAB 12, 13 and 14 - Phylum Platyhelminthes, cestodes: pseudophyllidean and cyclophyllidean tapeworms Observe, diagram and be able to recognize the life cycle stages of the broad fish tapeworm, a mosquitofish tapeworm, and representative cyclophyllideans (which will be continued in the next lab) and be able to diagram their biology.

Oct. 15 LAB 13 and 14 (continued) - Phylum Platyhelminthes, cestodes (continued): cyclophyllidean tapeworms. Continue to observe, diagram and be able to recognize the life cycle stages of common cyclophyllidean tapeworms, and be able to diagram their biology.

October 20. Laboratory Exam II: Platyhelminthes.

October 22 LAB 15 and Lab 16 - Phylum Acanthocephala; Phylum Nematoda: rhabditid and strongylid nematodes. Observe, diagram and be able to recognize the life cycle stages of common acanthocephalans and strongylids, and be able to diagram their life cycles.

October 27 LAB 17 - Phylum Nematoda (continued): trichostrongylid and ascarid nematodes. Observe, diagram and be able to recognize the life cycle stages of common trichostrongylids and also be able to diagram their life cycles. By dissecting adult *Ascaris*, be able to identify the gross anatomical features.

October 29 LAB 18 - Phylum Nematoda (continued): ascarid nematodes (continued). Observe, diagram and be able to recognize the life cycle stages of common ascarid nematodes and be able to diagram their life cycles.

Nov. 5 LAB 19 Phylum Nematoda (continued): spuriid and trichinellid nematodes. Observe, diagram and be able to recognize the life cycle stages of common spuriid and trichinellid nematodes, and be able to diagram their life cycles.

Nov. 10 LAB 20 - Phylum Arthropoda: survey of medically important arthropods. Survey representative arthropods and be able to identify them by common name and be able to name a parasite or microbe (if any) that they can transmit.

Nov. 12 LAB 20 (continued) - Phylum Arthropoda: survey of medically important arthropods. Survey representative arthropods and be able to identify them by common name and be able to name a parasite or microbe (if any) that they can transmit.

November 17. Laboratory Exam III: Acanthocephala, Nematoda, and Arthropoda.

Instructor's policy for accommodating disabilities

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and Disability Services for Students. If you think you may have a disability adversely affecting your academic performance, and you have not already registered with Disability Services, please contact Disability Services in Lommasson Center 154 or 406.243.2243. I will work with you and Disability Services to provide an appropriate modification.

Instructor's policy on academic honesty and plagiarism.

All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University. All students need to be familiar with the Student Conduct Code.