

Patrick Shiu (shiu@missouri.edu)

Course title:

Fungal Genetics and Biology (Bio Sc 8310, 3 credit hours)

Course description:

This course aims to introduce students to the field of fungal research, with an emphasis on the genetics, biochemistry, molecular biology, and cell biology of various fungi. Various topics will be discussed during the course of study, including (but not limited to) development, genomics, fungus-plant interaction, and gene regulation. The students will gain experience in giving presentations as well as in the ability to review, discuss, and design fungal research.

Course structure:

The class will meet for three hours a week to discuss a specific fungal topic. During each meeting, the instructor will convey the current advances of a given topic, followed by a comprehensive presentation of a research paper (by a student or a guest speaker). Research papers will be made available one week in advance and students are expected to have read the papers thoroughly. After each presentation, the class will discuss the paper and offer constructive criticism to the presenter. Students are also expected to submit brief research proposals for selected topics.

Evaluation:

Students will be evaluated on their assignments, presentations, and their participation in class discussion.

Presentations: 50%

Assignments: 30%

Attendance/participation: 20%

(There will be no tests or final exams.)

Sample topics:

Anatomy and morphology

Biochemistry & metabolism

Cell Biology & Cytology

Circadian rhythm & Photobiology

Gene silencing

Fungal growth and development

Fungus-plant interaction

Heterokaryon incompatibility

Horizontal gene transfer

Industrial Mycology & Biotechnology

Mating types

Medical Mycology

Molecular Biology & techniques

Phylogeny & Evolution

Population Genetics & Ecology

Signaling & gene regulation

Sample papers:

Dean RA, Talbot NJ, Ebbole DJ, Farman ML, Mitchell TK, and *et al.* (2005) The genome sequence of the rice blast fungus *Magnaporthe grisea*. *Nature* 434: 980-6.

Volpe TA, Kidner C, Hall IM, Teng G, Grewal SI, and Martienssen RA (2002) Regulation of heterochromatic silencing and histone H3 lysine-9 methylation by RNAi. *Science* 297: 1833-7.