

COURSE OVERVIEW AND OBJECTIVES

The nematode *Caenorhabditis elegans* is one of the most experimentally tractable animal models for genetics, molecular biology, cell biology, development, and physiology. This course will introduce students to the theory and practice of common research methods used with *C. elegans* to study genes, proteins, and the processes in which they function. These will include transgenesis, mating and crossing, histological staining, forward genetic screening, microscopy and anatomy, and high-throughput screening.

Approval from the instructor (Keith Choe) is required.

When? - Given the nature of some of the methods, this course needs to be conducted over consecutive days. Therefore, the instruction and lab work will be conducted **over spring break (March 1-8, 2014)**.

Format? – The course will include lectures to introduce topics and laboratory sessions to practice.

Who? - This course is intended for graduate students using or planning to use *C. elegans* and advanced undergraduate students already working in a *C. elegans* laboratory; undergraduates will need to be recommended by their faculty mentor. Coursework in genetics, cell biology, biochemistry, and physiology is recommended.

Cost? - A fee of **\$150 per student** is needed to cover costs of supplies and reagents and can be paid by either the student or their faculty mentor. This fee will be paid directly to the Biology Department

INSTRUCTORS

Keith P. Choe, Bartram Hall room 321, 273-0139, kchoe@ufl.edu

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TENTATIVE TOPICS

Genetics

- Mating, crossing, and mutant identification by PCR*
- Chemical mutagenesis, screening, outcross, complementation, mutation identification strategies*

Reverse Genetics

- Transgenesis – PCR fusion, Gateway cloning, primer design, micro-injection, integration, transposon methods*
- RNA interference – cloning strategies, tips on feeding, tissue-specific strategies, sensitized strains, tips on screening*
- Mutant libraries – Gene Knockout Consortium, National Bioresource Project, Million mutation project
- Genome editing – MOS1, CRISPR

Molecular and Cellular Analysis

- Microscopy and anatomy – DIC, fluorescence, WormAtlas*
- Immunohistochemistry and histological staining - fixation, staining, interpretation*
- BIOSORT - sorting and measuring*
- High-throughput screening – liquid culture, dispensing, measurements*

*Methods that will be practiced in the laboratory

Others

- Short student chalk-talks about their research interests

READINGS

There is no required textbook. Reading material will be selected from available sources.

TENTATIVE GRADING

Take-home written exam	30
Practical exam	30
Participation	40
Total	100

2014 participants (lab PI)

Tim Crombie (Julian) tim.crombie@gmail.com

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Attendance and Absences

Attendance during spring break is mandatory.

Students with Special Needs

Students with disabilities are required to register with the Disability Resource Center (DRC) if they are requesting accommodations. The DRC may be contacted at (352) 392-2565 or refer to the website at <http://www.dso.ufl.edu/drc>. It is the student’s responsibility to notify the instructor of any accommodation requests. I am happy to help.

No accommodations are available to students who lack this documentation. It is the policy of the University of Florida that the student, not the instructor, is responsible for arranging accommodations when needed.

UF counseling Services

Resources are available on-campus for students having personal problems or lacking clear career and academic goals. The resources include: 1) UF Counseling & Wellness Center, 3190 Radio Rd, 392-1575, psychological and psychiatric services. 2) Career Resource Center, Reitz Union, 392-1601, career and job search services. Many students experience test anxiety and other stress related problems. “A Self Help Guide for Students” is available through the Counseling Center (301 Peabody Hall, 392-1575) and at their web site: <http://www.counsel.ufl.edu/>.