

# Biology 115 – Plant Molecular Genetics – Biotechnology Fall 2010

**Instructor:** Nick Kaplinsky  
nkaplin1@swarthmore.edu  
106 Martin

**Location:** 210 Martin on Mondays from 1:15-4:15  
111 Martin on Wednesdays from 1:15-4:15 (see below)

Since humans first domesticated wild plants approximately ten thousand years ago we have been using a variety of techniques to control how plants grow and what they produce. Plant breeders have selected desired plant traits without much knowledge about the underlying genetics for hundreds of years and have used wide crosses, mutagens, grafting and tissue culture to produce novel traits. In the last twenty years plant molecular genetics has allowed scientists to create, modify and transfer traits from one species to another with unprecedented specificity and ease. The advent of high-throughput genotyping technologies and whole genome sequences marker-assisted breeding has started to supplant traditional breeding. This seminar will investigate some of the traits that are currently being created and modified using these techniques, we will look at new techniques that are currently under development, and importantly we will discuss some of the ethical and political issues that are closely associated with agricultural biotechnology.

## **Discussions on Mondays:**

This seminar will attempt to provide an overview of the field of plant biotechnology through discussions of recent primary literature with a focus on trying to integrate organismal phenomena (traits) and molecular mechanisms. We will discuss a discreet topic every week; some will stretch over several weeks. Each discussion will be led by two students who will each present one or two research papers and appropriate reviews or other background reading. The papers will be selected ahead of time by Nick and the presenters and will be posted on Moodle (<http://moodle.swarthmore.edu>) by the Thursday before the discussion. Each presentation is expected to consist of an introduction to the topic, a careful and critical analysis of the paper(s) to be discussed, and an attempt to sum up the conclusions of the papers for the week. Everyone will take part in the discussion and it is expected that you will read and think about the papers ahead of class. You will be evaluated based on your participation and particularly on the quality of your presentations.

To ensure that you have read and thought about each week's readings you should bring **discussion questions** to class every Monday. The quality of these questions is more important than their quantity; two non-trivial and discussable questions per

presentation will do. At the end of each discussion you will turn in your questions to Nick.

### **Labs on Wednesdays:**

In addition to the Monday discussions there is a research component consisting of independent projects. These can either be related to the research in Nick's lab or of your own choosing. We will discuss possible research projects the first week of class. The lab component of this course is a whole unit of academic credit. In addition to meeting every Wednesday afternoon you are also expected to work on your project as needed outside of this time period, as needed for the progress of your research. At the end of the semester you will write up a complete but concise lab report explaining the research that you were working on, the experiments you performed and your conclusions from these experiments, and what experiments you think should be performed next. This write up will be accompanied by a poster which will be displayed in Martin at the end of the semester. You will be evaluated based on your engagement with the project, both intellectually and in terms of how hard you work.

### **Student disabilities policy:**

If you believe that you need accommodations for a disability, please contact Tracey Rush in the Office of Student Disability Services, located in Parrish 113, or e-mail [trush1](mailto:trush1) for an appointment to discuss your needs and the process for requesting accommodations. Tracey Rush is responsible for reviewing and approving disability-related accommodation requests and, as appropriate, she will issue students with documented disabilities an Accommodation Authorization Letter. Since accommodations may require early planning and are not retroactive, please contact her as soon as possible.

### **Plagiarism policy:**

Cases of plagiarism in Bio25 will be reported to the CJC. If you have any questions about plagiarism please refer to the Bio 2 plagiarism guidelines (<http://tinyurl.com/ynt5ts>). If you have any doubt whether you are plagiarizing then use quotes and/or a citation.