

Dr. Margaret Lynch
Fall 2006

Biology 185 WW

Seminar in Plant Biotechnology

Syllabus

Course Professor: Dr. Margaret Lynch

Contact information: email: margaret.lynych@tufts.edu, phone: 617-627-3726

Class times: Tuesday, 10:30-11:45 AM, Thursday 10:30 AM– 12:30 PM.

Class location: Barnum 113

Examples of Plant Biotechnology

- Insect-resistant crops (Bt corn -produces a toxin that kills caterpillars)
- Herbicide-resistant crops (Roundup Ready™ crops-resistant to glyphosate)
- Virus-resistant plants (papaya to papaya ringspot virus)
- Drought and freeze-resistant plants (tomato, potato, rice)
- Production of plastic (polyhydroxybutyrate (PHB)-producing *Arabidopsis thaliana*)
- Edible vaccines (potato producing a vaccine for a virulent strain of *E. coli*)
- Production of antibodies for human therapeutics (Plantibodies™ to prevent transmission of *Herpes simplex* virus)
- Enhanced nutrient content of foods (β -carotene in rice and tomato)
- Phytoremediation (using plants to eliminate soil contaminants; for example, removal of lead by *Brassica juncea*)
- Biodegradable fabrics (Ingeo™)

Goals of the Course:

- 1) To appreciate that plants are more than “that green stuff outside”
- 2) To hone skills in reading and interpreting the scientific literature
- 3) To rigorously assess experimental design, data, interpretations, and to propose future experiments
- 4) To critically analyze arguments on the risks and benefits of genetically modified plants
- 5) To prepare and deliver an oral presentation on a topic of personal interest in plant biotechnology.
- 6) To use writing, not only as a means of communication, but also as a tool for learning
- 7) To synthesize a large number of experimental results into a review paper on a specific topic in plant biotechnology
- 8) To explain persuasively and clearly to a nonscientist what transgenic plants are and why farmers grow them.

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Class Schedule

Tues. 9/5- Introduction to Plant Biotechnology
Thurs. 9/7- Introduction to the Writing Workshop
Tues. 9/12-How to make a transgenic plant - Part I
Thurs. 9/14- How to make a transgenic plant – Part 2
Tues. 9/19– Case Study One: The effects of Bt toxin-producing crops: I
Thurs. 9/21 - Case Study One: The effects of Bt toxin-producing crops: II
Tues. 9/26– Case Study One: The effects of Bt toxin producing crops: III
Thurs. 9/28-
Library Research Resources
Tues. 10/3 -teams prepare for debate
Tues. 10/10– Case study two: Golden rice
Thurs. 10/12 Case study two: Golden rice
Tues. 10/17– Articles about GM plants in the popular press, including golden rice
Thurs. 10/19- Case study three: enhanced carotenoid and flavonoid content in tomato by RNAi
Tues. 10/24 – Plant vaccines
Thurs. 10/26 – Plant antibodies
Tues. 10/31 –prepare for oral presentation
Thurs. 11/2 –Oral presentations #1
Tues. 11/7 No class (Tufts Friday)
Thurs. 11/9 Phytoremediation
Tues. 11/14 GMOs in the news
Thurs. 11/16 –
Thanksgiving-no class
Tues. 11/28: Peer review of first drafts
Thurs. 11/30- Oral presentations on final paper topic
Thurs. 12/1 – last day of class, Final draft of final paper due

Grade components:

class debate: 20%
presentation 1: 20%
presentation 2: 20%
final paper*: 20%
overall class participation and attendance: 20%

Academic Honesty:

All students are expected to live up to the highest standards of academic honesty. For a description of Tufts' policy on academic ethics, please reread the section on "Academic Ethics" at <http://ase.tufts.edu/bulletin/gen-undergrad.html>.