**CSB 459H1S - PLANT MOLECULAR BIOLOGY AND BIOTECHNOLOGY**

24L

**Lecturer:**

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**Prerequisite**: BCH 311H1/CSB 349H1/MGY 311Y1

This course introduces students to major features of gene expression and signal transduction in plants. Topics include strategies for generating transgenic plants and regulating gene expression, as well as the importance of signal transduction in plant growth and survival. Strategies on how to manipulate plant gene expression will be discussed in detail. As well, how plants sense and respond at the molecular level to environmental stresses such as drought, salinity, cold and disease, will be discussed. Recent examples from the original literature will be used to study how plant gene expression and signal transduction research is conducted. Finally, the application of this basic scientific information in biotechnological strategies for improving agronomic traits will be addressed.

**Lecture Topics:**

1. Generation of transgenic plants - technology and applications

* plant regeneration
* methods for gene transfer into plant cells
* molecular techniques and strategies for the regulation of gene expression in transgenic plants (including gene targeting and gene knockout lines)

2. Signal Transduction and Stress Responses in Plants

* Basics of plant signalling
* Cytokinin signalling and growth regulation

3. Student Group Presentations

* primary research articles on plant biotechnology

**Required text:** Articles posted in Quercus

**Learning Objectives:**

* Acquire concepts and vocabulary associated with Plant Molecular Biology & Biotechnology
* Independently make connections and associations between different concepts
* Critically evaluate research data from primary research papers in PMB & B
* Design experimental plans for investigating specific research questions in PMB & B
* Work cooperatively in small groups
* Communicate and discuss plant biological research studies using appropriate scientific language

**Evaluation:**

Mid-term test 30%

Group presentation 15%

Individual written summary & annotated bibliography 10%

Attendance at group presentations 5%

Final exam (scheduled during the exam period) 40%