

PLANT MOLECULAR GENETICS
SOCR 740/BSPM 740
FALL ODD YEARS

Location: E005 Plant Sciences Building
Time: 11:00 a.m. - 12:15 p.m. on Tuesday/Thursday
Prerequisites: SOCR 330 or equivalent and BC 351

Instructor: Dr. Nora Lapitan
(http://www.soilcrop.colostate.edu/find_a_person/faculty/lapitan_intro.htm)

Contact information 491-1921; Nora.Lapitan@Colostate.edu

Office hours: 1:00-2:00 pm, MWF or by appointment

GOALS:

- Present current knowledge of plant gene and genome organization, and regulation of gene expression.
- Discuss genomic approaches for analyzing gene function and the application of these techniques in plant improvement.

OBJECTIVES:

- Develop critical thinking skills through exercises, discussions, and reading of journal articles.
- Learn the application of genomics techniques to address intractable questions in biology or agriculture through proposal writing.
- Encourage collaborative learning through discussions and group assignments.

TOPIC

I. Genome Organization and Evolution

No class

Overview, Introduction, Molecular Structure of the Eukaryotic Chromatin

Structure and Function of Centromere and Telomere

Molecular genetic techniques for analysis of genome organization

Organization and distribution of repeated sequence families and unique sequences in plant genomes

Paper discussion on genome organization of selected plant species

Transposable elements

Transposable elements

Paper discussion on transposable elements

Grant writing

II. Structural Genomics

Genetic mapping; **submit proposal abstract online**

Genetic mapping, Physical mapping

Physical mapping

DNA sequencing technologies and model organisms

Association mapping
Paper discussion
Comparative mapping
Bioinformatics

III. Functional Genomics

Transcript profiling techniques
Transcript profiling applications
Paper discussion
Gene regulation by microRNA
Methylation and the epigenome
Paper discussion
Reverse genetics: Transposons, T-DNA, RNAi, VIGS