765-510: ADVANCED PLANT GENETICS 2018 (25 80'-lectures; 3 exams)
Mon - Thurs 12:35-1:55

Topics (~ number of classes: dates)	**Instructor**
I. Introduction (3: T 9/6, M 9/10, T9/13) - Brief history of plant genetics - Chromosomes, chromatin and life cycle - Review of mendelian genetics	Gallavotti
II. Linkage analysis, molecular markers and recombination (3: M 9/17, T 9/20, M 9/24) - Markers - Detection and estimation of linkage from testcross and F2 data - Interval mapping, bulked segregant analysis, near isogenic lines - Mapping with recombinant inbreds - Synteny: orthologous and paralogous genes - Meiotic and somatic recombination	Gallavotti
III. Mutations (2: T 9/27, M 10/1) - Spontaneous and induced - McClintock's transposable elements and related transposons - Retrotransposons, T-DNA, and heterologous tagging - Gene editing	Gallavotti
EXAM 1 (30%; covers classes 1-8: Topics I-III) Thur. Oct. 4	
IV. Aneuploidy and polyploidy (1: M 10/8) - Aneuploidy and genetics of polyploids	Maliga
V. Genetic screens (1: T 10/11) - Genetic interactions and screens	Gallavotti
VI. Plant domestication (1: M 10/15) - Domestication of crop species: maize, rice, tomato	Gallavotti
VII. Map-based gene isolation (2: T 10/18, M10/22) - Theory and strategies - Practical exercise: positional cloning of a recessive mutant	Dong/Gallavotti
VIII. Guest lecture (1: T 10/25) - Physcomitrella: a unique recombination system	Lawton
IX. Haploid use and production (1: M 10/29) - Haploids	Maliga
X. Extrachromosomal inheritance (2: T 11/1, M 11/5) - Organelle genetics - Transmission - Recombination - Nuclear cytoplasmic interactions - Cytoplasmic male sterility & hybrid production	Maliga
EXAM 2 (30%; covers classes 9-17: Topics IV-X) Thurs. Nov. 8	

XI. Epigenetics (3: M 11/12, T 11/15, M 11/19) Gallavotti/Dong
- Paramutation
- Cosuppression and transgene silencing in transgenic systems
- Methylation and chromatin remodeling

XII. Genomics (3: M 11/26, T11/29, M 12/3) Messing/Gallavotti/Lam
- Guest lecture: history of plant genomics
- Genomic resources and new tools for genetic analysis
- Genomics of duckweed

XIII. Developmental Genetics (2: T 12/6, M 12/10) Gallavotti/Dong
- Paper/discussion

FINAL EXAM (40%: 20/40 from classes 18-25, Topics XI-XIII; 20/40 from classes 1-19, Topics I-X) Mon. Dec. 17 @ 12:30 PM in 138B Foran

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