Biology 423L Syllabus 2009

Laboratory Experiments in Genetics

Lecture: Monday at 11:00 am in Wilson Hall 128

Laboratories: Section 001: Tuesday at 2:00 p.m. in Wilson room 242
Section 002: Wednesday at 2:00 p.m. in Wilson room 242

Web site: http://www.bio.unc.edu/courses/2009Fall/Biol423L

Text book: Hartwell et al ed. 3. I strongly recommend buying the text but one copy will be on reserve for 2 hours at a time in the Undergraduate library.

There is no course pack. All lab protocols, reading lists and most reading materials will be available from the web site. A new version of the protocol will be available one week before each lab. Print out the protocol, read it carefully and bring it to class.

Instructor: Sarah Grant
Email: sgrant@email.unc.edu
Telephone: 919 962-0684
Office hours: Thursdays from 4:00-5:00 in Coker 213A

TA: Vanessa Gonzalez Perez
Email: Vanessa_gonzalez@med.unc.edu
Office hours: To be announced

TA: Louise Giffin
Email: giffin@email.unc.edu
Office hours: To be announced

Reports: Due in laboratory period 2 weeks after exercise finished. Penalty for handing in late: 50% off if handed in by 5:00 Wednesday for Section 001 and Thursday for section 002. Otherwise your report will not be graded and your grade will be recorded as 0 points. Exceptions can be made in unusual circumstances by arrangement (email to TA or instructor before due date)

Reports will be handed back one week after being turned in. Lab reports will make up 50% of the final grade. They will be graded out of 25 points: 5 for participation, 5 for abstract and introduction, 10 for methods and results and 5 for discussion.

See Course Information on web site for instructions on how to prepare lab reports.

Exams etc: 1 midterm for 15% of final grade.
1 research paper: 10% of final grade
Final exam 25% of final grade
Syllabus

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
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<tbody>
<tr>
<td>August 25/26</td>
<td>No labs - classes and labs will start next week</td>
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<tr>
<td>August 31</td>
<td>First Lecture: Mendelian Genetics</td>
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<td>Sept. 1/2</td>
<td>First lab exercise: Mendelian Genetics using Fast Plants.</td>
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<td>Sept. 7</td>
<td>Labor Day  no lecture</td>
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<td>Sept. 8/9</td>
<td>Pipetteman and Titration Exercise; Alleles in Yeast.</td>
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<td>Sept. 7/8</td>
<td>Report on Yeast Alleles due in lab Sept 15/16</td>
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<td>Sept. 14</td>
<td>Mouse Models and Epistasis</td>
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<td><strong>Readings for class:</strong> Hartwell Chapter 3 pp. 56-71.</td>
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<td>PDF available on web site.</td>
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<tr>
<td>Sept. 15/16</td>
<td>Epistasis using Mice</td>
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<td>Report on Epistasis in Mice due Sept 29/30 in lab period.</td>
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<td>Sept. 21</td>
<td>Yeast as a Model sSystem: guest lecture Dr. Elaine Yeh</td>
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<td><strong>Reading:</strong> Mutagenesis: Hartwell Chapter 7 pp.208-224,</td>
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<td>PDFs on web site:</td>
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<td>The Response of Yeast to Radiation</td>
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<td>A Closer Look at Biological Consequences of UV exposure</td>
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<td>A Closer Look at Repair of DNA</td>
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<td>Sept. 22/23</td>
<td>Mutation in Yeast</td>
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<td>Report on Mutation in Yeast due Oct. 6/7 in lab period.</td>
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<td>Sept. 28</td>
<td>Bacterial Genetics: Class</td>
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<td><strong>Readings for class:</strong> Bacterial Genetics: Hartwell Chapter 15 pp. 543-562, For discussion in class: Lederberg and Tatum 1946 J. Bact. 53: 673-684. PDF available on web site</td>
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<td>Sept. 29/30</td>
<td>Conjugation Lab</td>
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Report on Epistasis in Mice due this week.
Oct. 5  
**C. elegans as a Model System and Epigenetics**


Oct. 6/7 and 13/14: **C. elegans Genetics and RNAi**


Report on Mutation in Yeast due this week.

Oct. 12  
**University Day - class cancelled**

Oct. 13/14  
**Continue C. elegans Genetics and RNAi lab**

Research paper topics due Oct. 14, send email to Dr Grant by 5 pm Oct. 14

Report on C. elegans Lab due Oct. 27/28
Report on Conjugation Lab due this week.

Oct. 19  
**Three point cross and mapping in humans**


**Map based cloning of the gene for Cystic Fibrosis**

Readings for class: Cystic fibrosis: Hartwell Chapter 5 pp. 142-143, Map based cloning in humans: Hartwell Chapter 11 pp. 408-419.

For discussion in class: Pearson 2009 Nature 460; 165-169.

Oct. 20/21, Nov. 3/4, Nov. 17/18: **Drosophila three-point cross.**


Oct. 26  
**Midterm**

Oct. 27/28  
DNA Cloning lab. Run gels, set up ligations and transformations

Readings: Hartwell Chapter 9 pp. 303-326

Report on DNA Cloning Lab due Nov. 10/11.
Report on C. elegans Lab due in lab this week.

Nov. 2  
**Drosophila as a Model System Guest lecturer: Dr. Bob Duronio**

Nov. 3/4  
Drosophila Test Cross. Score for sex-linkage or autosomal markers, continue 3-point cross,

1-2 page outlines for research papers due November 6, email to Dr. Grant by 5 pm.
Nov. 9  DNA Markers and Forensics  
Readings for class: PCR and forensics: Hartwell Chapter 9 pp. 327-330. 
For discussion in class:  

Nov 10/11. DNA Markers and Forensics lab. 

Report on DNA Cloning lab due this week.

Nov. 16. Map Based Cloning in Model Organisms  
Readings for class: Physical Mapping of genes: Hartwell Chapter 10 pp. 354-365,  

Nov. 17/18 Score 3 pt Cross  
Report on Drosophila and 3 pt Cross due Dec 1/2.

Nov. 23. Association mapping for human diseases  
Reading for class: Hartwell Chapter 11 pp. 423-425,

Research papers due in class Monday Nov. 23.

No lab this week Thanksgiving

Nov. 30  Map Based Cloning continues

Dec. 1/2 Map Based Cloning lab.

Report on Drosophila lab due this week Dec. 2/3.

Dec. 7 Results of Map Based Cloning Review

Dec 14 exam 12:00 noon to 3:00 pm.  Final Exam  
128 Wilson Hall