

Molecular Biology 380.01
Spring 2007

Professor Leslie Gregg-Jolly

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Office hours: Tue. 2:00 – 3:00 pm

Fri. 10:00 - 11:00 am, or Email for appointment

Course web site:

URL: <http://web.grinnell.edu/courses/bio/S07/bio380/>

Course list-serve:

bio380-s07@lyris.grinnell.edu

Required texts:

1. Primrose, S. B., R. M. Twyman, and R. W. Old, **Principles of Gene Manipulation**. 2001, Blackwell Scientific Publications, Oxford. (Chapters listed below refer to readings in this text.)

2. Hall, S., **Invisible Frontiers: The Race to Synthesize a Human Gene**. 1987, Atlantic Monthly Press, NY.

3. *Investigations*, Departments of Biology and Chemistry, Grinnell College.

4. reference text, preferably from one of the following (in order of recommendation):

Alberts, B. (Editor), A. Johnson, J. Lewis, M. Raff, K. Roberts, and P. Walter, **Molecular Biology of the Cell, Fourth Edition**. 2002, Garland Publishing, NY and London. available on reserve in the science library.

Weaver, R.F., **Molecular Biology, Second Edition**. 2002, McGraw-Hill Companies, NY.

Lewin, B. **Genes VIII**. 2004, Pearson Prentice Hall, NJ

Lodish, H., A. Berk, P. Matsudaira, C. Kaiser, M. Krieger, S. L. Zipursky, and J. Darnell. **Molecular Cell Biology, Fifth Edition**. 2003, W.H. Freeman and company, NY.

Recommended text:

Barker, K. **At the Bench: A Laboratory Navigator**. 1998, Cold Spring Harbor Laboratory Press. available on reserve in the science library.

Grading scheme:

- 40%** Independent project including proposal, final paper, quality of experimental design and effort of execution
- 40%** Short assignments, class participation, lab notebooks, lab work prior to independent projects including citizenship
- 20%** Portfolio

Lecture schedule:

I. Techniques

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|--------|---------|---|
| Tues. | Jan. 23 | Introduction/overview of cloning
Chapters 1-3 and 6 |
| Thurs. | Jan. 25 | Introduction to Southern analysis for lab |
| Tues. | Jan. 30 | Principles of DNA isolation |
| Thurs. | Feb. 1 | Vectors
Chapters 4 & 5 |
| Tues. | Feb. 6 | Vectors and making libraries (review Chap. 6) |
| Thurs. | Feb. 8 | Screening libraries
Chapter 7
(literature citations for presentation due) |
| Tues. | Feb. 13 | DNA analysis: sequencing and PCR
(initial project consultations this week) |

II. Applications of Molecular Biology

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|--------|---------|---|
| Thurs. | Feb. 15 | Student presentations |
| Tues. | Feb. 20 | Student presentations |
| Wed. | Feb. 21 | 4:30pm Chemistry seminar. Kevin Yarema, Dept. of Biomedical Engineering, John Hopkins University |
| Thurs. | Feb. 22 | Conferences for independent projects |
| Tues. | Feb. 28 | Conferences for independent projects |
| Thurs. | Mar. 1 | RNA splicing-tentative
Guest speaker: Dr. Gregg Whitworth, UCSF, alumni scholar
(Bibliography for project proposals is due) |
| Fri. | Mar. 2 | 12:00pm Biology seminar, Gregg Whitworth, UCSF |

Tues. Mar. 6	Introduction to analysis of gene expression including microarrays
Thurs. Mar. 8	Tentative field trip
Tues. Mar. 13	Presentations of student proposals
Thurs. Mar. 15	Presentations of student proposals Written proposal due at the beginning of class

Spring Break

III. Topics in Molecular Biology (subject to change)

Tues. Apr. 3	Microarrays & Genomics
Thurs. Apr. 5	Microarrays & Genomics
Tues. Apr. 8	RNAi
Thurs. Apr. 10	RNAi
Tues. Apr. 15	Molecular switches/responding to the environment
Thurs. Apr. 17	Lab meeting/progress reports
Tues. Apr. 24	Lab meeting/progress reports
Wed. Apr. 25	4:30pm Chemistry seminar, David Jeruzalmi, Dept. MCB, Harvard
Thurs. Apr. 26	TBA Dr. Scott Hawley
Fri. Apr. 27	12:00pm Biology Seminar "Molecular Genetics of Meiosis" Scott Hawley, American Cancer Society Research Professor, Stowers Institute
Tues. May 1	Social and ethical implications of molecular biology
Thurs. May 3	Social and ethical implications of molecular biology
Tues. May 8	Social and ethical implications of molecular biology
Thurs. May 10	Final paper due before class, 2 copies
Tue. May 15	Portfolio due by 2:00pm