

# **Molecular Biology - MCDB 3500**

Meets Monday, Wednesday and Friday at 12:00 - 12:50 in A2B70, MCDB Addition

## **The instructors:**

**Dr. Jackie Lee** - Rm A245C MCDB, 303-492-6703, Jackie.Lee@Colorado.edu

Office hours - Friday 1-2 pm

**Dr. Ding Xue** - Rm A320C MCDB, 303-492-0271, Ding.Xue@Colorado.edu

Office hours - TBA

## **The teaching assistant:**

**Dong-Kyun Woo** - Rm MCDB B416, 303-492-5820, DongKyun.Woo@Colorado.edu

Office hours - Tuesday 4-5pm

Evening Review Sessions - As indicated on the Syllabus, Room A250 MCDB Addition

## **Texts:**

1. Molecular Biology by Robert Weaver, WCB/McGraw Hill, 1999.

This textbook is excellent basis for this course. The course closely follows the textbook. I will be using the figures from this textbook.

2. Molecular Biotechnology, 1998 (suggested reading--on Reserve at Norlin)

This is only a suggested book for those who would like to read more about cloning and biotechnology.

## **Exams & Grading:**

Six, 40 minute in-class quizzes have been scheduled, as well as, the three hour final (10:30 AM – 1 PM, Tuesday, May 7, 2002). The quizzes are each worth 50 points. The lowest quiz score will be dropped. The required cumulative final is worth 150 points. Course grades will be based on 400 points total, which will comprise the points from the final and the points from the best five of the six quizzes. You must take the final, and you are advised to take all the quizzes, even though one of these scores will be dropped. **NO MAKE-UP QUIZZES WILL BE GIVEN.** The final will be cumulative.

## **Lectures:**

This is a lecture course, in which we attempt to stay close to the textbook and the course outline provided. The lecture is used to highlight the key concepts and data described on the textbook, and to attempt to clarify difficult topics. Listed in the syllabus and Materials are the reading assignments and key concepts being addressed in the given units of the course.

## **Course Goals:**

The course has two goals. One is to cover the basic tenants of macromolecular synthesis in cells. The second goal is to expose the class to the types of experiments done by molecular biologists to examine how a biological process occurs. Toward the end of the class we will spend a month covering the recombinant DNA technology and cloning. By doing so, we hope that the students will develop a clear understanding of the basic concepts used in molecular biological experiments and be able to better participate in laboratory research.

## Spring 2002 MCDB 3500 Syllabus

**TEXT:** Molecular Biology by Robert Weaver

**Instructor:** Dr. Jackie Lee and Dr. Ding Xue

**TA:** Dong-Kyun Woo

1. 1/14 M Introduction to 3500
2. 1/16 W Overview: DNA, Chromosome structure (Ch. 1, Ch.2)
3. 1/18 F Overview: RNA & Protein (Ch. 3)
- 1/21 M No Class (Martin Luther King, Jr. Holiday)
4. 1/23 W DNA Replication (Ch. 20, pp.643-652)  
REVIEW (by Dong-Kyun) 6:30 pm in A250
5. 1/25 F DNA Synthesis Enzymology I (Ch. 20, pp. 654-661)
6. 1/28 M DNA Synthesis Enzymology II (Ch. 20, pp. 661-668)
7. 1/30 W Review  
REVIEW (by Dr. Lee) 6:30 pm in A250
8. 2/1 F **QUIZ 1: 1/14-1/30**
9. 2/4 M Prokaryotic transcription initiation (Ch. 6, pp 134-154)
10. 2/6 W Prokaryotic transcription elongation and termination (Ch. 6, pp. 154-171)  
REVIEW (by Dong-Kyun) 6:30 pm in A250
11. 2/8 F Transcriptional Control in Prokaryotes (Ch. 7)
12. 2/11 M Lambda gene regulation (Ch. 8, pp. 215-229)
13. 2/13 W Review  
REVIEW (by Dr. Lee) 6:30 pm in A250
14. 2/15 F **QUIZ 2: 2/4-2/13**
15. 2/18 M Eukaryotic RNA Polymerases I &III (Ch.10, 262-279; Ch. 11, pp.325-337)
16. 2/20 W Eukaryotic RNA Polymerases II (Ch. 10, 279-290; Ch.11, pp.298-321)  
REVIEW (by Dong-Kyun) 6:30 pm in A250
17. 2/22 F Eukaryotic Transcriptional Control (Ch.10, pp.291-293, Ch. 12)
18. 2/25 M The effects of Chromatin Structure on transcription (Ch.13)
19. 2/27 W mRNA Processing: 5' and 3' End Formation (Ch. 15)  
REVIEW (by Dr. Lee) 6:30 pm in A250
20. 3/1 F Review
21. 3/4 M **QUIZ 3: 2/15-3/1**
22. 3/6 W mRNA Splicing I (Ch. 14)
23. 3/8 F Group I and Group II Introns
24. 3/11 M Translation I (Ch. 17)  
REVIEW (by Dong-Kyun) 6:30 pm in A250
25. 3/13 W Translation II (Ch. 18)/ Ribosomes and tRNA  
REVIEW (by Dr. Lee) 6:30 pm in A250
26. 3/15 F Review
27. 3/18 M Guest Lecture
28. 3/20 W **QUIZ 4: 3/6-3/18**
29. 3/22 F Recombinant DNA technology: Introduction

SPRING BREAK - 3/25 to 3/29

The following lectures will be given by Dr. Ding Xue.

- 30. 4/1 M Recombinant DNA Technology (Ch. 4) -Basic techniques
- 31. 4/3 W Cloning vectors  
REVIEW (by Dong-Kyun) 6:30 pm in A250
- 32. 4/5 F Making a library
- 33. 4/8 M Library Screen, Probes
- 34. 4/10 W Expression Library
- 35. 4/12 F Cloning Strategies I
- 36. 4/15 M **QUIZ 5: 3/23-4/11**
- 37. 4/17 W Cloning Strategies II
- 38. 4/19 F Cloning Strategies III  
REVIEW (by Dong-Kyun) 6:30 pm in A250
- 39. 4/22 M Cloning Review
- 40. 4/24 W Sequence Analysis
- 41. 4/26 F Transgenics
- 42. 4/29 M **QUIZ 6: 4/13-4/25**
- 43. 5/1 W Genes and Diseases (By Dong-Kyun)
- 44. 5/3 F Course REVIEW (by Dr. Lee)

**FINAL: Tuesday, May 7th 10:30 AM- 1:00 PM**  
**Room A2B70**

For more information contact Dr. Jackie Lee at [Jackie.Lee@colorado.edu](mailto:Jackie.Lee@colorado.edu)