

PHARMACEUTICS 382V
Pharmaceutical Biotechnology
Dr. Maria Croyle
PHR 4.114 Spring 2003 Thursdays 2-5 pm
Course Syllabus

<u>Lecture</u>	<u>Date</u>	<u>Topic</u>	<u>Lecturer</u>
1	1/23	Bio 101: Cell Culture Techniques Part 1	Croyle
2	1/30	Bio 101: Cell Culture Techniques Part 2	Croyle
3	2/6	Molecular Bio 101: Principles of Recombinant DNA Technology [□]	Croyle
4	2/13	The Polymerase Chain Reaction	Croyle
5	2/20	Protein Purification/Bioprocessing ^{□□}	Croyle
6	2/27	Immunology 101: Biology of the Immune Response	Croyle
7	3/6	The Role of Immunology in the Pharmaceutical Industry	Croyle
*	3/13	No Class – Spring Break	
8	3/22	Gene Therapy 101	Croyle
9	3/29	Viral Vectors for Gene Therapy	Croyle
10	4/3	Non-viral vectors/oligonucleotide therapy	Croyle
11	4/10	Regulated Gene Expression Systems	Croyle
12	4/17	Special Topics – Adenoviral Vectors	J. Senesac
13	4/24	Proteomics/Genomics	V. Iyer
14	5/2	Future Prospects for Biotechnology	Croyle
*	5/15	Final Exam/Project due	

□ Cell culture assignment due

□ □ Molecular Bio/PCR problem set due

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Course Requirements:

Grades for the course will be based upon completion of a cell culture assignment (30%) Molecular Biology/PCR assignment (30%) and a final exam/project (40%).

Useful References:

For those of you who may prefer additional readings on the basic concepts covered in the lecture, I recommend these texts which are either on reserve in the library or will be available in my lab/office:

- 1) “Pharmaceutical Biotechnology” (Crommelin and Sindelar eds.) 2nd Edition Taylor and Francis Publishers 2002.
- 2) “Lehninger’s Principles of Biochemistry” (Nelson, Cox eds.) 3rd Edition. Worth Publishers 2000.
- 3) “Fundamentals of Biochemistry” (Voet, Voet and Pratt eds.) Wiley 1999
- 3) “Molecular Biology of the Cell” (Alberts, Bray, Lewis, Raff, Roberts, Watson eds.) 3rd Edition Garland Publishers 1994
- 4) “Cellular and Molecular Immunology” (Abbas, Lichtman, Pober eds.) 3rd W. B. Saunders Publishing 1997
- 5) “Immunobiology” (Janesway and Travers eds) 3rd Edition. Garland Publishers 1997.

Many relevant references will be provided as handouts with each set of lecture notes.

Course Objectives:

With the completion of the Human Genome project just in the horizon, the entire face of medicine as we now know it will change considerably. Treatment strategies will involve the use of the traditional chemical entities (ie drugs) as well as recombinant proteins and genetic material (RNA, DNA).

This course is designed to provide pharmaceuticals graduate students with a survey of the current technology used in basic science and the pharmaceutical industry to develop new medicines for the 21st century. After completing this course students should be able to:

- * select and evaluate appropriate *in vitro* and *in vivo* models by which to test novel formulations or delivery methods
- * understand the rationale and theory behind common techniques in the biotechnology field and use them to solve problems routinely encountered in the biotech industry.
- * understand how the immune system works and how this influences the development of recombinant DNA therapeutics
- * appreciate that modern therapeutics derived from the application of genetic techniques are often difficult to produce and handle but are highly specific for their biological sites of activity.
- * understand the concept of gene therapy, where the field is currently, and how the pharmaceutical scientist can play a significant role in development of a product to treat a genetic disease.
- * effectively interface with scientists involved in large scale production and processing of biological products with respect to formulation development and final product characterization.