Course Description: BISC406L is the capstone course for the Minor in Biotechnology offered by the College of Letters, Arts and Sciences and the Marshall School of Business. The course will focus on the impact of the biotechnology revolution on health care in this age of molecular medicine. Topics to be covered include: (1) Genetic engineering, molecular cloning and animal cloning; (2) Antibodies and vaccines; (3) Small-molecule drugs; (4) Cell therapy; (5) Gene therapy; and (6) Biotechnology regulation. We will address the ethical, legal and social implications of advances in biotechnology and will discuss governmental regulation of food, drugs, and biotechnology itself. The laboratory exercises will focus on recombinant DNA and other DNA techniques, which have played a fundamental role in the “new biotechnology” revolution.

Lectures: TTh 1:00-1:50 PM ZHS472
Lab: Thu 2:00-5:00 PM ZHS472

Instructor:
Prof. Miriam Susskind
Office: ZHS470
Office hours: by appointment arranged by email.
Tel/voicemail: 213-740-5553
E-mail: susskind@usc.edu

Laboratory Director:
Celeste Chong-Cerrillo, Ph.D.
Office: ZHS450
Tel/voicemail: 213-740-6085
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Teaching Assistant:
Andrew (Zac) Ostrow
E-mail: aostrow@usc.edu
Office hours: TBA

Web: Blackboard will be used to communicate with you. E-mail to you will be sent through Blackboard, so it will go to your USC e-mail address.

Prerequisites: BISC320L (Molecular Biology) is a firm prerequisite for this course. BISC325 (Genetics) is recommended, as is BISC330L (Biochemistry). We’ll assume you have already learned the material in BISC320L (Molecular Biology) on biotechnology, recombinant DNA, viruses, and cancer.

Grading:
Lecture:
Midterm exam 100 pts
Final exam 100 pts
Class participation 50 pts
& class quizzes 50 pts
Laboratory: 255 pts
TOTAL 505 pts
Letter grades are determined by a curve based upon total points. You are encouraged to look at the exams from previous semesters, which will be posted on Blackboard. Some assigned readings in this semester differ from those in previous semesters, so some exam questions will be mysterious. You will be able to obtain information about grading of your own work via Blackboard.
Reading Assignments, Discussions, and Lectures:

There is no required text for this course. Lecture periods will often involve DISCUSSION BY STUDENTS OF READING ASSIGNMENTS. Participation in these discussions is an important part of the course. A TENTATIVE reading list is given on p. 3-4 of this course syllabus. If we deviate from this version of the reading list, announcements on Blackboard will specify when each assigned article will be discussed. You should be prepared to discuss reading assignments on the day specified.

Assigned readings will be posted on Blackboard as PDFs for you to print for yourself. Most readings will be accompanied by guides, which are Word files. Some class sessions will be lectures; slides shown in lectures and in discussions will be posted as PPT files. The slides in PPT files are usually accompanied by extensive notes.

You are encouraged to refer to your texts from previous BISC courses (see References section of the lab manual) to help you understand the readings in this course. In addition, you’ll benefit from the use of a good, unabridged dictionary, such as The American Heritage Dictionary of the English Language (5th ed.) and an intelligible medical dictionary, such as Dorland’s Pocket Medical Dictionary.

Other Policies:

1. Exam dates are firm. There are no makeup exams. If you miss an exam due to a true medical emergency, you must, in a timely fashion, give Prof. Susskind documentation on official letterhead from a physician who: (a) is unrelated to you by blood, marriage, and/or adoption; AND (b) is currently licensed to practice medicine by The Medical Board of California (www.medi.ca.gov); AND (c) is willing to provide confirmation by phone that he or she saw you. A psychiatric excuse should be from an M.D. who is Board-certified in Psychiatry.

2. Regrading of lecture exams will be done only by Dr. Susskind, and only within one week of the day the exam is initially returned to the class. To request a regrade, give Prof. Susskind your exam and a typewritten explanation why you believe you should have received more points.

3. The only assignments for extra credit are a few questions in the lab manual (marked EXTRA CREDIT) and an occasional question in class (announced as extra credit), to stimulate discussion. No special assignment for extra credit is given to an individual student or subset of students.

4. You will be able to obtain information about grading of your own work via Blackboard. Final lecture exams will be kept by Prof. Susskind for the required length of time in ZHS470.

5. Academic integrity policies of the university will be strictly followed. Infractions can result in severe penalties (see “Academic Integrity” under “Syllabus and General Info” on Blackboard for BISC406L). An electronic copy of your laboratory Formal Report will be analyzed for plagiarism. No one will be admitted to an exam after the first student has left the exam.

6. It may be necessary to make some adjustments in the syllabus and reading list during the semester.

7. Students with disabilities: Any student requesting academic accommodations based on a disability is required to register with the Office of Disability Services and Programs (DSP) each semester. A letter of verification for approved accommodations can be obtained from DSP. Be sure that the letter is delivered to Dr. Susskind as early in the semester as possible. DSP is located in STU 301 and is open 8:30-5:00, Monday through Friday. The telephone number for DSP is 213 740-0776.
Lecture/Discussion Schedule

<table>
<thead>
<tr>
<th>No.</th>
<th>Date</th>
<th>Type</th>
<th>Topic</th>
<th>Reading</th>
</tr>
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<tbody>
<tr>
<td>1</td>
<td>Tue 28 AUG</td>
<td>Lect</td>
<td>Intro to course</td>
<td>-</td>
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<tr>
<td>2</td>
<td>Thu 30</td>
<td>Lect</td>
<td>Intro to biotechnology</td>
<td>-</td>
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<tr>
<td>3</td>
<td>Tue 4 SEP</td>
<td>Lect</td>
<td>Recombinant proteins 1</td>
<td>1</td>
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<tr>
<td>4</td>
<td>Thu 6</td>
<td>Lect</td>
<td>Recombinant proteins 2</td>
<td>-</td>
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<tr>
<td>5</td>
<td>Tue 11</td>
<td>Disc</td>
<td>Animal engineering</td>
<td>2-4</td>
</tr>
<tr>
<td>6</td>
<td>Thu 13</td>
<td>Lect</td>
<td>DNA technology</td>
<td>-</td>
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<tr>
<td>7</td>
<td>Tue 18</td>
<td>Disc</td>
<td>DNA techniques in forensics</td>
<td>5</td>
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<tr>
<td>8</td>
<td>Thu 20</td>
<td>Disc</td>
<td>DNA techniques in diagnostics</td>
<td>6</td>
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<tr>
<td>9</td>
<td>Tue 25</td>
<td>Lect</td>
<td>Immunology 1</td>
<td>7-10</td>
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<tr>
<td>10</td>
<td>Thu 27</td>
<td>Lect</td>
<td>Immunology 2</td>
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<td>11</td>
<td>Tue 2 OCT</td>
<td>Lect</td>
<td>Immunology 3</td>
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<tr>
<td>12</td>
<td>Thu 4</td>
<td>Lab only</td>
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<tr>
<td>13</td>
<td>Tue 9</td>
<td>Disc</td>
<td>Vaccine development</td>
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<td>14</td>
<td>Thu 11</td>
<td>Disc</td>
<td>Monoclonal antibodies as drugs</td>
<td>12-13</td>
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<td>15</td>
<td>Tue 16</td>
<td>MIDTERM EXAM</td>
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<td>16</td>
<td>Thu 18</td>
<td>Lect</td>
<td>Drug discovery</td>
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<td>17</td>
<td>Thu 23</td>
<td>Disc</td>
<td>Antiviral drugs</td>
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<td>18</td>
<td>Thu 25</td>
<td>Disc</td>
<td>Gleevec</td>
<td>16-17</td>
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<td>19</td>
<td>Tue 30</td>
<td>Disc</td>
<td>Drugs for genetic disease</td>
<td>18-19</td>
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<tr>
<td>20</td>
<td>Thu 1 NOV</td>
<td>Lect</td>
<td>Intro to cell therapy</td>
<td>20-22</td>
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<tr>
<td>21</td>
<td>Tue 6</td>
<td>Disc</td>
<td>Cardiac and vascular repair</td>
<td>23-24</td>
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<td>22</td>
<td>Thu 8</td>
<td>Disc</td>
<td>Using stem cells to model disease</td>
<td>25-26</td>
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<tr>
<td>23</td>
<td>Tue 13</td>
<td>Disc</td>
<td>Reprogramming adult pancreatic cells</td>
<td>27</td>
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<td>24</td>
<td>Thu 15</td>
<td>Lect</td>
<td>Intro to gene therapy</td>
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<td>25</td>
<td>Tue 20</td>
<td>Disc</td>
<td>Gene therapy for hemophilia</td>
<td>29</td>
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<td></td>
<td>Thanksgiving - university holiday</td>
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<tr>
<td>26</td>
<td>Tue 27</td>
<td>Disc</td>
<td>Gene therapy for X-linked ALD</td>
<td>30</td>
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<tr>
<td>27</td>
<td>Thu 29</td>
<td>Lect</td>
<td>DNA and RNA drugs</td>
<td>31-32</td>
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<tr>
<td>28</td>
<td>Tue 4 DEC</td>
<td>Disc</td>
<td>Aptamer-mediated delivery of siRNA</td>
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<td>29</td>
<td>Thu 6</td>
<td>Disc</td>
<td>Biotech regulation</td>
<td>34-35</td>
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TUE DEC. 18     FINAL EXAM (CUMULATIVE) 11 AM - 1 PM

WARNING: THIS IS THE TENTATIVE READING LIST. CHECK BLACKBOARD FOR UPDATES.