Course Title: Fundamentals of Medical Biotechnology

Course Number  GMS MS 793 A1

Graduate Medical Sciences
Boston University School of Medicine

General Course Information

Course Directors: Dr. Traish & Dr. Franzblau

Course Faculty
Abdulmaged Traish, MBA, Ph.D.  atraish@bu.edu
Professor
Department of Biochemistry
Department of Urology

Carl Franzblau, Ph.D.  franzbla@bu.edu
Professor
Department of Biochemistry

Course Assistants

Course Location  L210

The Course: Biotechnology is emerging as one of the fast growing and dominant technologies of the 21st century. It represents a bridging of innovation between physical, biological and medical sciences and depends on entrepreneurship and public acceptance. Medical biotechnology involves the rapid and prudent transformation of basic scientific and medical discoveries into products for the marketplace. This fast-paced transformation creates an urgent need for qualified, capable individuals to promote and manage the rapidly-evolving innovative technologies in a highly complex and competitive ethical, legal, and regulatory environment. Professionals who aspire to become leaders and managers in the emerging field of medical biotechnology must develop a profound understanding of the complexity of medical biotechnology and acquire the needed tools to steer it to a successful outcome.

The goal of this course is to provide graduate students with knowledge pertaining to the scientific, political, legal and ethical issues that drives the advancement and innovation in medical biotechnology. This course will provide students with basic concepts and understanding of how the various drivers of medical biotechnology interact with one another and shape the business and finance of this industry and impact the growth of medical biotechnology companies. Students will be introduced to a host of scientific development, legal and ethical issues that shape the public view of the medical biotechnology and its applications.
The course will provide students with an historical perspective in the fast emerging medical biotechnology and the innovative processes that ensures the success of such endeavors. The course will also cover a host of topics that will provide the students with a springboard to develop their creative thinking and explore their ideas of new vision of medical biotechnology. The course will cover the following topics:

- History of Medical Biotechnology
- Sphere and influence of Medical Biotechnology on Advancement of Medicine
- Basic Characteristics of the Medical Biotechnology; The four segments:
  - Pharmaceutical
  - Medical Biotechnology
  - Diagnostic
  - Medical Devices
- Drivers of Medical Biotechnology
  - Scientific innovations & Entrepreneurship
  - Political and Social Progress
  - Legal and Ethical Developments
- Intellectual Properties; Use & Protection
- Domains of Medical Biotechnology; Public & Private Sector partnerships
- Stages of Growth and Development of Medical Biotechnology
- Research & Development in Medical Biotechnology
- Innovation and Entrepreneurship in Medical Biotechnology
- Business Models in Biotechnology
- Marketing of Medical Biotechnology

**Course Structure**

The course format will be based on lectures by faculty and invited speakers (when possible) and presentations of chosen articles, cases and topics by students and faculty. This format will provide students an opportunity to engage in discussions pertaining to the various issues in biotechnology and to learn how to critically assess and evaluate the fundamentals and the drivers of medical biotechnology. Students are expected to present their critical analysis of the assigned case for discussion by peers. This is an important aspect of this course and skills needed for their future endeavors in learning and working in the medical biotechnology enterprises.

**Course Schedule**

The course will meet once a week from 3:00 to 4:50 on Tuesdays starting on January 17th, 2012. The course schedule is posted on the course website.

**Presentation/Discussion**

**Course Materials**

**Text Book:** *Building Biotechnology, Third Edition, Yali Friedman, 2008*

**General Reading Materials:** Selected articles of general interest will be posted on the course web site. These reading materials are intended to provide the students with background information on the topics under discussion.

**Assigned Reading Materials:** The assigned course materials are comprised of published articles from the current literature encompassing various aspects of the
medical biotechnology. Reading of such articles is highly recommended and will serve as the basis for discussion.

**Important:** Please do not copy or distribute materials from the syllabus posted on the course website.

**Web Site**

A Blackboard 8 web site will be used for scheduling changes, announcements and any supplemental material. You will need your BU login name and Kerberos password to access the site.

**Please check the course website frequently!**

**Student Evaluation and Grading**

**Course Structure and Grading Policy:** The course will be comprised of a series of lectures and presentations by faculty and invited speakers from the industry, when possible as well as assigned discussions by students.

Case presentations of selected biotechnology companies, to illustrate innovation, business models, ethical and legal issues will be made. For each class, one hour session will be devoted for presentation of background material and discussion of concepts and approaches.

The second hour of the session will be devoted to discussion of assigned articles or cases. A team of two to three students will be assigned a case or a given article to analyze and critique the information in the case. The students will present an oral report (15 minutes) followed by class discussion of the issues raised (35 minutes). The discussion is led by the students who present and all students are expected to contribute to the discussion.

Since student participation is critical to meeting the learning objectives of this course, students must attend all classes. In the event, that you need to miss a class due to an emergency situation, please contact the course directors and inform them of your situation. It is imperative that you make every effort to attend all sessions.

Faculty will make evaluations of students based on the quality and level of discussion and on participation and the quality of the discussion in each class. Grading will be based on:

- a) A midterm assignment of case analysis (30%),
- b) The clarity of the oral class presentation and discussion (20%),
- c) Participation in class discussions over the period of the course (20%) and
- d) A final written analysis of an assigned case (30%).

A letter grade will be given based on overall performances. [93-100 = A, 88-92 = A-, 78-87 = B+, 70-77 = B].