

INTRODUCTORY GENE AND IMMUNOTHERAPY

GMS 6132:

2 CREDIT HOURS

SPRING 2017

Online

COURSE DIRECTOR:

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Professor

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OFFICE HOURS: By email appointment with the course director or specific instructor.

COURSE WEBSITE: TBD

COURSE COMMUNICATIONS: General course announcements will be made by the course director or course instructors online or will be emailed to all students. Specific questions for the course director or instructors are best asked by email. If a discussion/forum page is set up, questions that would benefit students will be posted there.

PREREQUISITIES: MCB 5205 or GMS 6121; BCH 5413 or MCB 6937; or permission of instructor

REQUIRED TEXT: NONE

ADDITIONAL RESOURCES: General course materials and required reading will be available on the Canvas course website. Recommended texts include:

- Molecular Biology of the Gene –7th ed. By James D. Watson (CSH Laboratory)
- Molecular Biology of the Cell. 5th ed. By Bruce Alberts (Garland Science)
- Immunobiology, 8th ed. By Janeway (Garland Science)

COURSE DESCRIPTION: GMS 6132 is an introductory online course aimed at students pursuing an advanced degree in microbiology and/or biochemistry. The goal of this course is to provide a broad overview of gene and immunotherapy with a particular emphasis on translational applications. Furthermore, the course is designed to enable students to gain a fundamental understanding of the principles and mechanisms of gene and immunotherapy. Individual lectures will cover (I) introduction of molecular biology background of gene therapy and preclinical and clinical applications, and (II) introduction of basic immunology and immunotherapy, and preclinical and clinical applications. The course will be taught by an experienced molecular biologist with extensive basic research and clinical trial experiences.

PREREQUISITE KNOWLEDGE AND SKILLS: This course is designed to be taught in the second semester of the online MS degree in Microbiology and Cell Science with a concentration on Medical Microbiology and Biotechnology. It is optimal that students, via taking the first semester of the program, will have a basic understanding of general molecular biology, biochemistry, immunology, and cell biology.

COURSE GOALS AND/OR OBJECTIVES: The goal of this course is to provide a fundamental background in gene and immunotherapy with further introduction of related molecular biology technologies, and discussion of particular preclinical and clinical applications. The course is designed to enable students to gain a fundamental understanding of the principles and mechanisms of gene and immunotherapy.

INSTRUCTIONAL METHODS: This class will be presented online with 30 hr of lectures, discussions and examinations. The course will utilize an online format, in which each lecture will be presented with approximately 50 minutes of materials. The course will include two Segments: (I) introduction of gene therapy and pre-clinical and clinical applications (II) introduction of immunology and immunotherapy, and pre-clinical and clinical applications. Segment (I) will cover molecular biology background of gene therapy strategies and translational applications. Segment (II) will cover general immunology and concepts of immunotherapy, and specific applications of immunotherapy in treating diseases. Prior to each online session, students will take a short, open-book quiz reviewing key objectives that will be or have been covered. After reading assigned material and taking the quiz, students will participate in online discussions in a bulletin board-type format. Participation in the discussions by posting answers to questions and comments on other students' answers will be required and will count towards the final grade.

COURSE POLICIES:

ATTENDANCE POLICY: The online class will include interactive online discussion of the materials via a discussion page, and participation in these discussions is mandatory. Students are expected to participate unless they obtain permission of the instructor ahead of time, in accordance with UF policy on attendance: (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>).

QUIZ/EXAM POLICY:

- **Quizzes:** Online quizzes are aimed at encouraging timely mastery of assigned course material, and will be done during self-study using online resources and/or the text.
- **Exams:** Exams are online open-book essay type questions.

MAKE-UP POLICY: If a student misses an assignment such as a homework or quiz, it may be made up only according to University of Florida policy for allowable excused absences (<https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx>).

ASSIGNMENT POLICY: Prior to each class meeting, students will be expected to view the appropriate online segment and then take a short open-book quiz reviewing key objectives that will be or have been covered. After reading assigned material and taking the quiz, students will participate in online discussions in a bulletin board-type format. Participation in the discussions will be by posting

answers to questions from the instructor and making comments on other students' answers. This will count towards the final grade.

CLASS DEMEANOR: Students are expected to participate in the online class discussions and complete the entire class. They should be prepared from reading the recommended textbooks and literature. They are expected to participate in discussions and to be prepared to provide answers to questions that are asked.

UF POLICIES:

UNIVERSITY POLICY ON ACCOMMODATING STUDENTS WITH DISABILITIES: Students requesting accommodation for disabilities must first register with the Dean of Students Office (<http://www.dso.ufl.edu/drc/>). The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation. You must submit this documentation prior to submitting assignments or taking the quizzes or exams. Accommodations are not retroactive, therefore, students should contact the office as soon as possible in the term for which they are seeking accommodations.

UNIVERSITY POLICY ON ACADEMIC MISCONDUCT: Academic honesty and integrity are fundamental values of the University community. Students should be sure that they understand the UF Student Honor Code at <http://www.dso.ufl.edu/students.php>.

NETIQUETTE: COMMUNICATION COURTESY: All members of the class are expected to follow rules of common courtesy in all email messages, threaded discussions and chats.
<http://teach.ufl.edu/docs/NetiquetteGuideforOnlineCourses.pdf>

ONLINE COURSE EVALUATION: Students are expected to provide feedback on the quality of instruction in this course based on 10 criteria. These evaluations are conducted online at <https://evaluations.ufl.edu>. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at <https://evaluations.ufl.edu/results>.

GETTING HELP:

For issues with technical difficulties for E-learning in Canvas, please contact the UF Help Desk at:

- Learning-support@ufl.edu
- (352) 392-HELP - select option 2
- <https://lss.at.ufl.edu/help.shtml>

Any requests for make-ups due to technical issues MUST be accompanied by the ticket number received from LSS when the problem was reported to them. The ticket number will document the time and date of the problem. You MUST e-mail your instructor within 24 hours of the technical difficulty if you wish to request a make-up.

Other resources are available at <http://www.distance.ufl.edu/getting-help> for:

- Counseling and Wellness resources
- Disability resources

- Resources for handling student concerns and complaints
- Library Help Desk support

Should you have any complaints with your experience in this course please visit <http://www.distance.ufl.edu/student-complaints> to submit a complaint.

GRADING POLICIES:

GRADING: Students will take 2 online open-book exams, each covering one segment of the course. Together, exams will account for 60% of the final grade. In addition, students will take online quizzes prior to each class period except for the first class. Quizzes will cumulatively account for 20% of the final grade. Online discussions will count for 20% of the grade.

GRADING SCALE: The default grading scale for the class is: A \geq 90, A- 87-89.9, B+ 84-86.9, B 80-83.9, B- 77-79.9, C+ 74-76.9, C 70-73.99, C- 67-69.9, D+ 64-66.9, D 60-63.99, D- 57-59.9, E \leq 56.9. See the UF policy on grades at: <https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx>

TOPICAL COURSE SCHEDULE:

Part 1: Gene therapy technologies and applications: (15hr)

- Introduction of molecular biology history
- General concept of mammalian gene expression and regulation (2 hr)
- Development of gene transfer tools – viral and non-viral vectors
- DNA viral vectors – adenoviral vectors (AdV)
- DNA viral vectors – adeno-associated viral vectors (AAV)
- RNA viral vectors – retroviral vectors (RV)
- RNA viral vectors – lentiviral vectors (LV)
- Gene therapy for genetic diseases
- Gene therapy for infectious diseases
- Gene therapy for cancer (2 hr)
- Gene therapy clinical trials
- Part 1 literature presentation and discussion
- Examination 1

Part 2: Introduction of immunology and immunotherapy and applications. (15 hr)

- Introduction of fundamental immunology (3 hr)
- History of vaccine and immunotherapy development (3 hr)
- Basic concept of cancer treatment and immune response (2 hr)
- Cancer vaccines and preclinical studies (2 hr)
- Chimeric antigen receptor engineering and clinical studies (2 hr)
- Immune checkpoint regulation and cancer treatment
- Part 2 literature presentation and discussion
- Examination 2