

INTRODUCTORY GENE AND IMMUNOTHERAPY

GMS 6132

2 CREDIT HOURS

ONLINE

Fall 2023

COURSE DIRECTOR:

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OFFICE HOURS: By appointment.

COURSE WEBSITE: Canvas (<https://ufl.instructure.com/>)

COURSE DESCRIPTION: This course provides an overview of gene and immunotherapy with emphasis on translational applications. Students will gain a fundamental understanding of the principles and mechanisms of gene and immunotherapy, specifically molecular biology of gene therapy and basic immunology and immunotherapy. Preclinical and clinical applications of both will be discussed.

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: GMS 6132 is an introductory course aimed at students interested in learning about the principles and recent advances in gene therapy and immunotherapy. The course is divided into two parts. The first session each week is a lecture on the week's subject. There is a video and PDF of the PowerPoint. Each lecture has a 5-question multiple choice homework quiz that is due at the end of the week (Sunday evening). The second session is a primary research paper on the subject for the week. A multiple choice homework quiz aimed at enforcing the timely reading of the paper and directing thoughtful analysis of the paper will be due at the end of the week. Students must post a discussion comment in a discussion forum. Higher grades for the discussion are earned by citing related literature in the discussion to varying degrees, i.e., specific figures or tables.

COURSE COMMUNICATIONS: General course announcements will be posted as an "Announcement" in Canvas or will be emailed to all students via Gatorlink email. Students are expected to view

Announcements and check their UF email daily to keep informed of communication from the faculty. Failure to view an Announcement will not be a valid excuse for missing important updates or adverse consequences as a result. Specific questions for the faculty are best asked during class or by Gatorlink email, not Canvas email.

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

PREREQUISITE KNOWLEDGE AND SKILLS: Students should have a basic understanding of general microbiology, molecular biology, biochemistry, immunology, and cell biology.

REQUIRED TEXT: None. The fields of immunotherapy and gene therapy are evolving so rapidly that any textbook will be out of date on printing. The literature half of the course will consist of primary research papers posted in Canvas. If you are unfamiliar with immunology, getting a good textbook would be helpful, e.g., Immunobiology, 9th ed. By Janeway (Garland Science).

COURSE POLICIES:

ATTENDANCE POLICY: As an online course, there is no attendance per se. However, students are expected to review the lecture for the week and complete the HW quiz on time, in addition to reading the assigned research paper, completing the HW quiz for each paper, and participating in the bulletin board discussions for each paper on time. If a student cannot complete an assignment, he/she must contact the instructor ahead of time (see Make-up policy below). Penalties for up to half-off can be exacted for late assignments. The UF attendance policy is found here: <https://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>

QUIZ/EXAM POLICY:

- **Post lecture HW Quizzes:** HW quizzes are aimed at encouraging timely mastery of assigned course material. They are open note/open book, but students may not collaborate on completing them.
- **Post lecture Exams:** Exams are multiple choice and will be administered by Honorlock and are closed book. They will be administered over three-day windows to accommodate students who work. There will be two exams that will cover the material taught during that exam's period.
- **Research paper HW quizzes:** These quizzes will reinforce the understanding of the critical methods and results of the assigned research paper. They are open note, but not collaborative.
- **Research paper discussions:** Minimally, the discussion post encourages students to express their thoughts on the assigned paper. To get a higher grade, students must cite another related primary research paper and specific data from that paper.

GRADING POLICY:

- The lecture HW quizzes count as 25% of the grade.
- The lecture exams cumulatively count as 50% of the grade (30% exam1, 20% exam 2).
- The research paper HW quizzes count as 15% of the grade.
- The research paper discussions count as 10% of the grade.

Grading Scale: The default grading scale for the class is: A ≥ 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 ≤ 66.9 . See the UF policy on grades at: <https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/>

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

If an issue comes up that will impair your ability to take an exam as scheduled, you must contact the course director ahead of time. Once you take an exam and do not do well because of difficulties, there is nothing that can be done.

Note: There are no make-up exams or extra credit to compensate for poor grades on exams, quizzes, or assignments.

CLASS DEMEANOR: Students are expected to participate in the online class discussions and complete assignments on time.

SCHEDULE:

SECTION 1 – GENE THERAPY

- Week 1: Course introduction and overview of gene therapy, immunotherapy, and clinical trials.
- Week 2: Adeno-associated viral vectors (AAV)
- Week 3: Adenoviral vectors (AdV)
- Week 4: Retroviral and lentiviral vectors (RV and LV)
- Week 5: HSV and Pox virus oncolytic therapy
- Week 6: Bacterial gene therapy
- Week 7: Plasmids, ASOs, RNAs, transposons
- Week 8: CRISPR gene editing
- Week 9: Examination 1

SECTION 2 – IMMUNOTHERAPY

- Week 10: Introduction to immunotherapy, immunological diseases, and cancer
- Week 11: Vaccines against infectious diseases and cancer
- Week 12: Chimeric antigen receptor T cells (CAR-T cells)
- Week 13: Antibody therapies
- Week 14: Immunotherapy drugs
- Week 15: Examination 2

UF POLICIES:

University Policy on Accommodating Students with Disabilities: Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center. It is important for students to share their accommodation letter

with their instructor and discuss their access needs, as early as possible in the semester. The Disability Resource Center web page is <https://disability.ufl.edu/>.

University Policy on Academic Misconduct: UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Conduct Code specifies a number of behaviors that are in violation of this code and the possible sanctions. Click here to read the Conduct Code. If you have any questions or concerns, please consult with the instructor or TAs in this class. Students should be sure that they understand the UF Student Honor Code at <https://sccr.dso.ufl.edu/process/student-conduct-code/>.

Plagiarism: When writing discussion posts, if you use Ctrl-C from someone else's writing and you change every other word, this is plagiarism and, you will get caught. I use Turnitin.com to check for plagiarism. If you plagiarize, I will give you the harshest grade penalty and file an academic honesty report with the Dean of Students.

Course/Faculty Evaluation: Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <https://gatorevals.aa.ufl.edu/students/>. Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <https://ufl.bluer.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.aa.ufl.edu/public-results/>.

GETTING HELP:

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

Learning-support@ufl.edu

- (352) 392-HELP
- <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.

In-Class Recording:

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the

University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student

CAMPUS RESOURCES:

Health and Wellness

U Matter, We Care: If you or someone you know is in distress, please contact umatter@ufl.edu, 352-392-1575, or visit U Matter, We Care website to refer or report a concern and a team member will reach out to the student in distress.

Counseling and Wellness Center: Visit the Counseling and Wellness Center website or call 352-392-1575 for information on crisis services as well as non-crisis services.

Student Health Care Center: Call 352-392-1161 for 24/7 information to help you find the care you need, or visit the Student Health Care Center website.

University Police Department: Visit UF Police Department website or call 352-392-1111 (or 9-1-1 for emergencies).

UF Health Shands Emergency Room / Trauma Center: For immediate medical care call 352-733-0111 or go to the emergency room at 1515 SW Archer Road, Gainesville, FL 32608; Visit the UF Health Emergency Room and Trauma Center website.

GatorWell Health Promotion Services: For prevention services focused on optimal wellbeing, including Wellness Coaching for Academic Success, visit the GatorWell website or call 352-273-4450.

Academic Resources

E-learning technical support: Contact the UF Computing Help Desk at 352-392-4357 or via e-mail at helpdesk@ufl.edu.

Career Connections Center: Reitz Union Suite 1300, 352-392-1601. Career assistance and counseling services.

Library Support: Various ways to receive assistance with respect to using the libraries or finding resources.

Teaching Center: Broward Hall, 352-392-2010 or to make an appointment 352-392-6420. General study skills and tutoring.

Writing Studio: 2215 Turlington Hall, 352-846-1138. Help brainstorming, formatting, and writing papers.

Student Complaints On-Campus: Visit the Student Honor Code and Student

Conduct Code webpage for more information.

On-Line Students Complaints: View the Distance Learning Student Complaint Process.