

# Introductory Gene and Immunotherapy

GMS 6132

**2 credit hours**

**Online**

## **course director:**

Jennifer Boddicker, Ph.D.

Lecturer

Department of Molecular Genetics & Microbiology  
College of Medicine

[jboddicker@ufl.edu](mailto:jboddicker@ufl.edu)

(352)273-6594

Office Hours: By appointment. Please contact me anytime to make an 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 halves. The first session each week is a lecture based on review articles 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 each week 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. A bulletin board discussion page will be posted for each paper, and all students must participate in the discussion by contributing an original comment. 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. **DO NOT USE CANVAS EMAIL. USE GATORLINK (UFL.EDU) EMAIL.**

**PREREQUISITIE 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 virology, bacteriology, 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 didactic half of this course will be taught via review articles that will be posted in Canvas. 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, 9<sup>th</sup> 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:

- **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.
- **Exams:** There are two exams – one for each section of the course. **The exams are closed book, closed note, multiple choice, with questions similar to the quizzes. Exams will be administered via Honorlock. Students are expected to be familiar with the procedures for having all of the necessary hardware and software to take the exams via Honorlock. There is a 3 day window for each exam. You must use an external side-viewing webcam when taking the exams. There is an example of what the side camera should show, which include both sides of the tabletop/desktop around the computer as well as both hands, and the student's face. If you do not use a side camera or if your**

**camera view is not in compliance, you are subject to a 50 point penalty for the exam.**

- **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 of Discussions.** Discussions will be graded on participation and the use of other publications. **The default grade for a discussion post is 8. Appropriately citing other relevant PRIMARY research papers will earn 9, and discussing a primary paper in enough detail to show that you read it (i.e., citing figures and tables) will earn 10 points. If you mistakenly claim that a review article is a primary paper, you will get a 7.**

**Note - the assigned paper cannot be used as a primary research paper for additional points. Do not label it as a primary paper. I already know that it is.**

**Discussions must be posted with the following format.**

- 1. General comments** on the assigned paper and/or subject. Remember, a multiplication of words gets you nothing.
- 2. Comments from related literature.** If you choose to cite and/or discuss other related papers to get a higher grade, place those comments separately in this section. **If you cite a review, then state that it is a review. If it is a primary research paper, then state that.** If you want 10 points, cite figures or tables. You don't have to include them in your comment, and **please do not attach files. I will not open them.**
- 3. Literature cited.** Place your appropriately formatted references here. Pay attention to my instructions to get full credit. Label your ONE representative PRIMARY paper as such. You can use more than one, but you must label only one as your designated primary paper.

The related literature must be cited in the discussion text (either numbered or author/year) and appropriately referenced at the end of the discussion. **The reference list must include: The first author, year, title, journal name, volume, page numbers. Do not include extraneous detail such as the DOI and web address.** If you cite an e-preprint, there is still a volume assigned and another number. **If you're in doubt, in PubMed there is a "cite" button that will give you the necessary info.**

**Here is a detailed description of a primary research paper** (as opposed to review or news item). A primary research paper is where someone actually did some real bench science and experiments. They will have tables and figures of **new data from their study (not data from other studies that they are commenting on).** There will be a **materials and methods**

section of the paper. There will be a results section and a discussion section. PubMed will also usually tell you if it is a review (but not always).

**You do not get any credit for review articles, news articles, Wikipedia, CDC web pages, etc., but you must still cite them to avoid plagiarism.**

**I am not looking for nor giving extra credit for lengthy posts.** I'm looking for **thoughtful** posts. So please do not write more to get more. Of course, if you feel passionately about a paper, then write away! The whole purpose of this journal club is to enable a critical reading of the literature, promote critical thinking, teach some microbiology via the literature, and stimulate interest in science.

**You don't get extra credit for discussing numerous related papers to less detail.** I would much rather that you discuss one relevant primary paper in enough detail to get a 10. This doesn't mean writing volumes. It means describing some experiments in more detail than would be put in the abstract. **You must cite a figure or table and summarize what it says. DO NOT QUOTE FROM THE PAPER (even if properly cited with quotations marks). THIS IS INTELLECTUALLY LAZY.** If I cannot tell that you read the paper, I am not going to check the abstract. I don't have time to do that. I am going to give you a 9.

**Please do not place attachments in your discussion.** If you want to show a table or figure, include it in your post. But you don't have to do that if you cite it and state the results.

**Plagiarism:** When writing your discussion, if you use Ctl-C from someone else's writing, you are asking for trouble. If you change every other word from someone else's comments, you will get caught. **I use Turnitin.com to check for plagiarism.** There is an exercise on plagiarism during the first week, so no one has any excuse at all for plagiarizing and then claiming ignorance. **If you plagiarize, I will give you the harshest grade penalty and file an academic honesty report with the Dean of Students.** This happens on too frequent of a basis. If I discover on your last submission that you plagiarized, I will examine every previous post, and if there is plagiarism on them they will be penalized as well. This will cause you to fail the course.

**Using any AI mechanism (such as, but not limited to, ChatGPT, Grammarly) to generate any part of your discussion post is plagiarism because you are taking credit for someone/something else's work.** There is sensitive AI detection now, just like Turnitin.com, so you will get caught.

**If you use AI or even a thesaurus to paraphrase text from another source, this is plagiarism, too.** Using a synonym for literally every word of someone else's writing is plagiarizing their ideas and writing.

**JUST WRITE YOUR OWN THOUGHTS AND WORDS. YOU ARE NOT BEING GRADED ON THE DEPTH OR LENGTH OF YOUR DISCUSSION POST, SO WHY JEOPARDIZE YOUR ACADEMIC AND POSSIBLY WORK CAREER?**

**VPN to access full articles:** Accessing and reading other papers is important for this class if you want to earn more than a B. You can access e-journals that UF has subscriptions to

by using VPN. Without this, you can only see abstracts. VPN essentially makes your computer act as if it was on campus while you are connected. To install VPN, go to this web page: <http://www.uflib.ufl.edu/login/vpn.html> (Links to an external site.). It has the instructions. You have to install the VPN software (free), then configure it to connect to UF (instructions provided on the page). When you want to access journals, you open the VPN program, login to Gatorlink VPN with your UF credentials, then it is as if your computer was on campus. You'll automatically have access to all of the e-journals that UF has subscriptions to when you open the full text/pdf from PubMed or Google Scholar. You must run VPN every time you boot your computer or after it sleeps from inactivity.

### **Grading policy:**

- The lecture HW quizzes count as 25% of the grade.
- The lecture exams cumulatively count as 50% of the grade (30% exam 1, 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  $\geq 90$ , 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  $\leq 66.9$ . 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.

### **Tentative 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: Herpes and Pox viruses as oncolytic therapy

- Week 6: Bacterial gene therapy
- Week 7: Plasmids, RNAs, ASOs, and transposons
- Week 8: CRISPR and gene editing
- Week 9: Examination 1

## Section 2 – immunotherapy

- Week 10: Introduction to immunology and cancer
- Week 11: Vaccines
- 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](https://sccr.dso.ufl.edu/process/student-conduct-code/Links to an external site.) 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/Links to an external site.>

**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.ua.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.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <https://gatorevals.ua.ufl.edu/public-results/>.

## GETTING HELP:

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

[Learning-support@ufl.edu](mailto:Learning-support@ufl.edu)

- (352) 392-HELP
- [https://Links to an external site.://Links to an external site.issLinks to an external site..Links to an external site.atLinks to an external site..Links to an external site.uflLinks to an external site..Links to an external site.eduLinks to an external site./Links to an external site.helpLinks to an external site..Links to an external site.shtmlLinks to an external site.](https://links.to/an/external/site.issLinks.to/an/external/site..Links.to/an/external/site.atLinks.to/an/external/site..Links.to/an/external/site.uflLinks.to/an/external/site..Links.to/an/external/site.eduLinks.to/an/external/site./Links.to/an/external/site.helpLinks.to/an/external/site..Links.to/an/external/site.shtmlLinks.to/an/external/site.)

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](mailto: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](mailto: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.

Instructional materials for this course consist of only those materials specifically reviewed, selected, and assigned by the instructor(s). The instructor(s) is only responsible for these instructional materials.