

	Course	Cellular Microbiology BIOL 4310
	Professor	Mehmet Candas
	Term	Spring 2016
	Meetings	Friday 10:00 am - 12:45 pm Room: JSOM 11.202

Professor's Contact Information

Office Phone	972-883-6338
Office Location	FN 3.206
Email Address	candas@utdallas.edu
Office Hours	F 1:00-2:00 pm Best way to reach Dr. Candas is via email communication. If you need to have a meeting, please schedule via e-mail.

General Course Information

Pre-requisites	Successful completion of BIOL 2311, BIOL 2312
Course Description	<p>Cellular Microbiology explores concepts involved in the interactions between microbes and human host. The course covers pathogenesis of infectious diseases in the context of host cell properties and immune responses. It introduces various human pathogens and describes their virulence and pathogenesis by incorporating mechanistic aspects involving molecular cell biology, microbiology, immunology, virology and parasitology. Emphasis is given on the theme that microorganisms co-evolve with their hosts. Ecological and evolutionary associations that determine the dynamic nature of host-microbe interactions and how diseases may arise from these interactions are evaluated from a clinical perspective. The course also gives a particular attention to topics on human microbiome and incorporates discussions on current trends in translational medicine that evaluate the symbiotic relationships between humans and gut microbiome. It establishes the basis of an evolutionary relationship between the internal and external environment of the body that has a central role in human health and diseases. New paradigms on how variations in the microbiome influence host health and behavior, and may be implicated in disease etiology and metabolism are studied.</p> <p>The course intends to support upper-level students seeking to advance their knowledge in medical microbiology and infectious diseases towards studies in medicine, health professions and</p>

	<p>biomedical research. Topics include evolution of pathogens, invasion, toxins, manipulation of host cell functions, cell death, and innate immune responses. The course also explores current studies in the field of microbial genomics, human microbiome, probiotic microorganisms, antimicrobials, vaccine development, molecular diagnostics and applications of functional genomics and proteomics platforms to molecular microbiology and infectious diseases research.</p>
<p>Learning Outcomes</p>	<p>The primary objective of the course is to provide a fundamental understanding into evolutionary aspects of how microorganisms interact with eukaryotic host cells, adapt to changing environments, develop/acquire pathogenic traits, and how host cells defend themselves against invading pathogens.</p> <p>Upon successful completion of this course, students will:</p> <ul style="list-style-type: none"> • Describe the genetic mechanisms and ecological influences involved in the evolution of commensals and pathogens. • Demonstrate broad knowledge of the cellular and molecular aspects of host-pathogen interactions. • Understand common themes involved in microbial pathogenesis. • Describe the principal mechanisms by which specific pathogens infect their hosts and cause disease. • Understand host defenses and immune responses (innate and acquired). • Evaluate mechanism of action of antimicrobial drugs and vaccines in terms of infectious disease control. • Understand the influence of microorganisms in health and diseases in the context of human microbiome, probiotics and prebiotics. • Understand research involving molecular microbiology and microbial genomics. • Apply the principles of infectious disease epidemiology and infection control to selected research problem infection control strategies.
<p>Course Material</p>	<p>There is no required text book. The course reviews up-to-date and relevant concepts based on current research. Lecture slides and assignments (original research articles and review papers involving microbial pathogenesis, medical microbiology, drug and vaccine development, and microbial genomics) are posted via Blackboard.</p>

Suggested Readings	<ul style="list-style-type: none"> Cellular Microbiology (Pascale Cossart, Patrice Boquet, Staffan Normark, and Rino Rappuoli) ASM Press
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Tentative Schedule and Topics

DATES	TOPICS
Jan 16	Introduction to Cellular Microbiology Co-evolution and co-differentiation of microbe and host
Jan 23	Delineating pathogenesis and virulence
Jan 30	EXAM 1
Feb 6	An overview of eukaryotic host cell biology
Feb 13	An overview of eukaryotic host cell biology
Feb 20	Bacterial adhesion and invasion of host cells
Feb 27	Bacterial adhesion and invasion of host cells Bacterial quorum sensing and biofilms in infections
Mar 6	EXAM 2
Mar 13	Bacterial toxins and secretion systems
Mar 16-20	SPRING BREAK
Mar 27	Manipulation of cytoskeleton and membrane trafficking by pathogens
Apr 3	Intracellular pathogens
Apr 10	EXAM 3
Apr 17	Innate immune responses, inflammation Manipulation of autophagy and apoptosis pathways by bacteria
Apr 24	Human microbiome and intestinal homeostasis
May 1	Microbiome influence on allergy, diseases, and behavior
May 8	EXAM 4

These descriptions and timelines are subject to change at the discretion of the Professor.

Course Policies

Exams and Assignments	<p>The approach for meeting the course objectives will be a combination of successful completion of exams, attending class meetings, reading assigned articles, and participating in class discussions and group work.</p> <p>Exams may include multiple choice and short-answer questions. The questions will be based on information covered in the lectures, assigned materials/articles, discussions and group work. Participation in discussions and group work activities is graded and requires preliminary examination of assigned articles and completion of activity sheets that will be turned in by every student during the class meeting. Completion of all exams, assignments and participation in activities, discussions and group work are mandatory. Missed or not-accepted exams or assignments are graded "zero".</p>
Make-up Exams	<p>If you do miss an exam or graded class activity, the score will be recorded as "0" (zero). There is no make up for missed classwork and group activities. Make-up exams will be provided only in cases of documented excuses, emergencies, official university business (e.g., athletic team), or professional school (e.g., medical school) interviews. Documents must support that you were unable to attend the exam at the time it was given. Most "return to work" slips do not indicate that there was a sickness or emergency and they do not specify the date and reason for visit and diagnosis by a doctor or clinic. Thus you need to provide an official documentation indicating specifically the date and reason of admission to a clinic, or a documentation indicating attendance to a school interview, or demonstrating an extraordinary or emergency situation.</p> <p>Make-up exams may be entirely essay questions and may have verbal question component. There will be no multiple choice questions on make-up exams. The highest grade possible on a make-up exam is the average of your other exams. Students should not be able to benefit from the extra time that other students do not have. Students can maintain their average but not improve upon it.</p> <p>Since religious holidays are known in advance, we must be informed of them at the beginning of the semester. Scheduled trips well in advance are acceptable, but it is best to inform us as soon as possible (not one or two days before an exam).</p>

Extra Credit	None																								
Grading	<p>Overall assessment is based on in-class exams (80%) and participation in group activities and class discussions (20%). Final letter grade is based on the average score obtained from the exams and graded class activities.</p> <p>Grades will be distributed as following:</p> <table><tr><td>97-100%</td><td>A+</td><td>73-75%</td><td>C+</td></tr><tr><td>92-96%</td><td>A</td><td>70-72%</td><td>C</td></tr><tr><td>88-91%</td><td>A-</td><td>66-69%</td><td>C-</td></tr><tr><td>84-87%</td><td>B+</td><td>62-65%</td><td>D+</td></tr><tr><td>80-83%</td><td>B</td><td>60-61%</td><td>D</td></tr><tr><td>76-79%</td><td>B-</td><td>55-59%</td><td>D-</td></tr></table>	97-100%	A+	73-75%	C+	92-96%	A	70-72%	C	88-91%	A-	66-69%	C-	84-87%	B+	62-65%	D+	80-83%	B	60-61%	D	76-79%	B-	55-59%	D-
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Class Attendance	Attendance is required. The class meetings include interactive work and discussions on original research papers and review articles along with audio/video presentations on specific topics. Group work and discussions will involve completion of activity sheets that will be turned in during the class meetings for grading.																								
Field Trip Policies	Not applicable																								
Student Conduct and Discipline	<p>The University of Texas System and The University of Texas at Dallas have rules and regulations for the orderly and efficient conduct of their business. It is the responsibility of each student and each student organization to be knowledgeable about the rules and regulations which govern student conduct and activities. General information on student conduct and discipline is contained in the UTD publication, <i>A to Z Guide</i>, which is provided to all registered students each academic year.</p> <p>The University of Texas at Dallas administers student discipline within the procedures of recognized and established due process. Procedures are defined and described in the <i>Rules and Regulations, Board of Regents, The University of Texas System, Part 1, Chapter VI, Section 3</i>, and in Title V, Rules on Student Services and Activities of the university's <i>Handbook of Operating Procedures</i>. Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in</p>																								

	<p>interpreting the rules and regulations (SU 1.602, 972/883-6391).</p> <p>A student at the university neither loses the rights nor escapes the responsibilities of citizenship. He or she is expected to obey federal, state, and local laws as well as the Regents' Rules, university regulations, and administrative rules. Students are subject to discipline for violating the standards of conduct whether such conduct takes place on or off campus, or whether civil or criminal penalties are also imposed for such conduct.</p>
Academic Integrity	<p>The faculty expects from its students a high level of responsibility and academic honesty. Because the value of an academic degree depends upon the absolute integrity of the work done by the student for that degree, it is imperative that a student demonstrate a high standard of individual honor in his or her scholastic work.</p> <p>Scholastic dishonesty includes, but is not limited to, statements, acts or omissions related to applications for enrollment or the award of a degree, and/or the submission as one's own work or material that is not one's own. As a general rule, scholastic dishonesty involves one of the following acts: cheating, plagiarism, collusion and/or falsifying academic records. Students suspected of academic dishonesty are subject to disciplinary proceedings.</p> <p>Plagiarism, especially from the web, from portions of papers for other classes, and from any other source is unacceptable and will be dealt with under the university's policy on plagiarism (see general catalog for details). This course will use the resources of turnitin.com, which searches the web for possible plagiarism.</p> <p>Plagiarism</p> <p>You should acknowledge where ideas or knowledge not originally your own come from. The acknowledgment should be done even if you state your understanding of the idea in your own words.</p> <p>It is not appropriate to use extensive paragraphs from a text or web site without citation. Even the use of a phrase from a book, an article or the internet without quotation marks and citing the reference is considered plagiarism.</p> <p>Be especially careful in cases in which you work together with your lab partners. While you would have the same data, the ideas presented in your lab report must be your own.</p>

	<p>Any instance of plagiarism is handled by the Academic Judiciary.</p> <p>Avoiding Plagiarism [Adapted from Duke University's guidelines for writers] Take time to make careful choices among--and learn to use--the research tools available to you. You will probably find that your favorite web search engine is not adequate by itself for college-level research. Consult with your professor or a librarian. You may need to use specialized research tools, some of which may require learning new searching techniques.</p> <p>Expect to make trips to the library. While you can access many of the library's resources from your home computer, you may find that you need to make several trips to use materials or research tools that are not accessible remotely. Of course, you will be seeking the best information, not settling for sources simply because they happen to be available online.</p> <p>Allow time for gathering materials that are not available at UT Dallas. The InterLibrary Loan Office can borrow articles and books from other libraries, but this process takes additional time.</p> <p>Allow time for reading, rereading, absorbing information, taking notes, synthesizing, and revising your research strategy or conducting additional research as new questions arise.</p> <p>Sloppy note-taking increases the risk that you will unintentionally plagiarize. Unless you have taken note carefully, it may be hard to tell whether you copied certain passages exactly, paraphrased them, or wrote them yourself. This is especially problematic when using electronic source materials, since they can so easily be copied and pasted into your own document.</p> <p>Identify words that you copy directly from a source by placing quotation marks around them, typing them in a different color, or highlighting them. (Do this immediately as you are making your notes. Don't expect to remember days or weeks later what phrases you copied directly.) Make sure to indicate the exact beginning and end of the quoted passage. Copy the wording, punctuation and spelling exactly as it appears in the original.</p> <p>Jot down the page number and author or title of the source each time you make a note, even if you are not quoting directly but are only paraphrasing.</p>
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Email Use	<p>The University of Texas at Dallas recognizes the value and efficiency of communication between faculty/staff and students through electronic mail. At the same time, email raises some issues concerning security and the identity of each individual in an email exchange. The university encourages all official student email correspondence be sent only to a student's U.T. Dallas email address and that faculty and staff consider email from students official only if it originates from a UTD student account. This allows the university to maintain a high degree of</p>

	<p>confidence in the identity of all individual corresponding and the security of the transmitted information. UTD furnishes each student with a free email account that is to be used in all communication with university personnel. The Department of Information Resources at U.T. Dallas provides a method for students to have their U.T. Dallas mail forwarded to other accounts.</p>
Withdrawal from Class	<p>The administration of this institution has set deadlines for withdrawal of any college-level courses. These dates and times are published in that semester's course catalog. Administration procedures must be followed. It is the student's responsibility to handle withdrawal requirements from any class. In other words, I cannot drop or withdraw any student. You must do the proper paperwork to ensure that you will not receive a final grade of "F" in a course if you choose not to attend the class once you are enrolled.</p>
Student Grievance Procedures	<p>Procedures for student grievances are found in Title V, Rules on Student Services and Activities, of the university's <i>Handbook of Operating Procedures</i>.</p> <p>In attempting to resolve any student grievance regarding grades, evaluations, or other fulfillments of academic responsibility, it is the obligation of the student first to make a serious effort to resolve the matter with the instructor, supervisor, administrator, or committee with whom the grievance originates (hereafter called "the respondent"). Individual faculty members retain primary responsibility for assigning grades and evaluations. If the matter cannot be resolved at that level, the grievance must be submitted in writing to the respondent with a copy of the respondent's School Dean. If the matter is not resolved by the written response provided by the respondent, the student may submit a written appeal to the School Dean. If the grievance is not resolved by the School Dean's decision, the student may make a written appeal to the Dean of Graduate or Undergraduate Education, and the dean will appoint and convene an Academic Appeals Panel. The decision of the Academic Appeals Panel is final. The results of the academic appeals process will be distributed to all involved parties.</p> <p>Copies of these rules and regulations are available to students in the Office of the Dean of Students, where staff members are available to assist students in interpreting the rules and regulations.</p>
Incomplete Grades	<p>As per university policy, incomplete grades will be granted only for work unavoidably missed at the semester's end and only if 70% of the</p>

	<p>course work has been completed. An incomplete grade must be resolved within eight (8) weeks from the first day of the subsequent long semester. If the required work to complete the course and to remove the incomplete grade is not submitted by the specified deadline, the incomplete grade is changed automatically to <u>F</u>.</p>
Disability Services	<p>The goal of Disability Services is to provide students with disabilities educational opportunities equal to those of their non-disabled peers. Disability Services is located in room 1.610 in the Student Union. Office hours are Monday and Thursday, 8:30 a.m. to 6:30 p.m.; Tuesday and Wednesday, 8:30 a.m. to 7:30 p.m.; and Friday, 8:30 a.m. to 5:30 p.m.</p> <p style="padding-left: 40px;">The contact information for the Office of Disability Services is: The University of Texas at Dallas, SU 22 PO Box 830688 Richardson, Texas 75083-0688 (972) 883-2098 (voice or TTY)</p> <p>Essentially, the law requires that colleges and universities make those reasonable adjustments necessary to eliminate discrimination on the basis of disability. For example, it may be necessary to remove classroom prohibitions against tape recorders or animals (in the case of dog guides) for students who are blind. Occasionally an assignment requirement may be substituted (for example, a research paper versus an oral presentation for a student who is hearing impaired). Classes enrolled students with mobility impairments may have to be rescheduled in accessible facilities. The college or university may need to provide special services such as registration, note-taking, or mobility assistance.</p> <p>It is the student's responsibility to notify his or her professors of the need for such an accommodation. Disability Services provides students with letters to present to faculty members to verify that the student has a disability and needs accommodations. Individuals requiring special accommodation should contact the professor after class or during office hours.</p>
Religious Holy Days	<p>The University of Texas at Dallas will excuse a student from class or other required activities for the travel to and observance of a religious holy day for a religion whose places of worship are exempt from property tax under Section 11.20, Tax Code, Texas Code Annotated.</p> <p>The student is encouraged to notify the instructor or activity sponsor</p>

	<p>as soon as possible regarding the absence, preferably in advance of the assignment. The student, so excused, will be allowed to take the exam or complete the assignment within a reasonable time after the absence: a period equal to the length of the absence, up to a maximum of one week. A student who notifies the instructor and completes any missed exam or assignment may not be penalized for the absence. A student who fails to complete the exam or assignment within the prescribed period may receive a failing grade for that exam or assignment.</p> <p>If a student or an instructor disagrees about the nature of the absence [i.e., for the purpose of observing a religious holy day] or if there is similar disagreement about whether the student has been given a reasonable time to complete any missed assignments or examinations, either the student or the instructor may request a ruling from the chief executive officer of the institution, or his or her designee. The chief executive officer or designee must take into account the legislative intent of TEC 51.911(b), and the student and instructor will abide by the decision of the chief executive officer or designee.</p>
Off-Campus Instruction and Course Activities	<p>Off-campus, out-of-state, and foreign instruction and activities are subject to state law and University policies and procedures regarding travel and risk-related activities. Information regarding these rules and regulations may be found at http://www.utdallas.edu/BusinessAffairs/Travel_Risk_Activities.htm. Additional information is available from the office of the school dean.</p>

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