



School of Molecular & Cellular Biology

MCB 297A, Spring 2024

MCB Honors Discussion Section A, 1 Credit Hours



Instructor

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Office Location: CLSL B408

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Class Meeting Schedule

Scheduled Class Time: M 3:00-3:50 PM

Office Hours: No specific office hours are set, as they were not used in the past. However, the professor is happy to meet with students at an arranged time. Students should contact the professor at least 48 hours prior to the desired meeting time.

Course Overview and Description

MCB297A is the honors discussion class associated with MCB250. It is the first class in a series of honors discussion classes and introduces the honors students to reading scientific papers.

Course Prerequisites, Requirements met (general education, major, minor)

The student has to be enrolled in the honors program and concurrent enrollment in MCB250 is also required.

Student Learning Outcomes

At the end of the course, through assignments, discussions, activities and assessments, students will be able to:

- understand and summarize the main points of a primary scientific paper
- understand and describe the methods of a primary scientific
- explain a primary scientific paper in layman's terms

Course Text/Materials Information

No textbook is required for this class. Required reading for each week will be posted on the Moodle site.

Course Website, Course Tools (Canvas, Moodle, LON-CAPA, Zoom, etc.)

<https://learn.illinois.edu/>

Grading Information and Breakdown

Letter grades for MCB 297A will be assigned according to the following grade scale:

<u>200 Point Scale</u>	<u>Grade</u>
200-184	A+
183-180	A
179-177	A-
176-170	B+
169-157	B
156-150	B-
149-143	C+
142-137	C
136-130	C-
129-123	D+
122-117	D
116-110	D-
109-0	F

Discussion worksheets: 50 points

We will discuss published research papers starting with the second class meeting. In preparation for each class you should (i) read and analyze the assigned paper(s) and complete the homework for that class. You can email me your homework at jnradin@illinois.edu.

There will be a total of 12 homework assignments, each of which will be graded on a scale of 0-5 points. You will be allowed to drop two homework assignment. You may use any resources at your disposal to answer the questions on the homework assignment but be aware that all responses must be stated in your own words. If you need to quote the assigned paper or some other source, use quotation marks. When quoting third party sources, also provide a reference.

Answer these questions thoughtfully, *i.e.* don't just copy sentences out of the text. A major goal of higher education is to learn how to summarize complex ideas in your own words, and in this class we will practice that skill as it relates to scientific inquiry.

Preparedness/Participation: 100 points

Your oral contribution to the honors discussion section will account for one-half of your grade. Please note that you are permitted only **one** unexcused absence from discussion. If you need to miss more than one class meeting due to illness or other factors outside your control, you must obtain the instructors' permission in a timely fashion. Be aware that being present in class is not enough to get full participation.

In addition to summarizing the goals and experimental approach of the assigned papers, you should come to class prepared to answer the following questions:

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1. What background information is presented that prompted the authors to come up with the question(s) being asked in their hypothesis?
 2. How did the authors present and interpret their results?
 3. How do the authors' results support/refute their hypothesis?
 4. What is/are the authors' conclusion based on their results?

In addition to class participation each of you will present the methods assigned to you. This will be part of a group presentation, each group consisting of 2-3 students.

Your participation score for the semester will be determined at the semester's end in general accordance with the following scale:

- 100 pts Demonstrates a clear understanding of the paper's hypothesis, approach, and conclusions. Routinely able to explain and interpret individual experiments in detail. Regularly participates in discussion of questions posed to the class as a whole.
- 90 pts Can summarize the important features for the majority of papers, and can explain and interpret the details of most individual experiments. Usually participates in discussion of questions posed to the class as a whole.
- 80 pts Generally understands the hypothesis and approach of papers, but has some difficulty summarizing major points. Can explain the central features of experiments, but often unable to address details or has trouble with interpretation. Sometimes participates in discussion of questions posed to the class as a whole.
- 70 pts Can explain major points about the paper, but does not fully understand the goals or conclusion. Displays a superficial understanding of individual experiments, and often cannot explain details. Occasionally participates in discussion of questions posed to the class as a whole.
- 60 pts Can explain major points about some papers, but not all. Displays a superficial understanding of experiments; cannot explain details, nor interpret results. Participates in discussion of questions posed to the class infrequently.
- 50 pts Has significant difficulty summarizing papers or understanding experiments. Cannot explain the interpretation of results. Rarely participates in discussion of questions posed to the class as a whole.

Term paper: 50 points

One-quarter of the points in this course will be awarded on the basis of a final term paper that you must submit by 5PM on May 3rd, the Friday after classes end.

▫ Honors credit requires a written report describing in detail a scientific paper (or two) on a given subject. You may choose a topic you are interested in. I am not very picky about the topic, as I want you to write about something that you are interested in. The only requirements for the paper topic are it is biology-related and primary literature.

□The paper should be 4-6 pages, single-spaced, 12-point font, 1” margins. References are not included in this page limit. The paper should have the following format:

Background

Give the technical and historical perspective. What was the state of knowledge at the time the experiments were done? What led to these experiments? What does your reader need to know to understand the experiments?

Experimental

Cover the experiments in at least one paper, but don’t just regurgitate the paper. What was the experimental strategy? Be sure to discuss the controls. Be critical - are there other interpretations? Are there flaws? In some cases you might want to review two papers or part of a second paper to get a more complete story. Also, you will likely need to go back in time (and perhaps forward in time) and read additional papers or reviews to understand the overall story. This does not mean that you need to read all of these papers in detail - just enough to get a feel for the bigger picture.

Discussion

How do the results and conclusions fit into the larger body of knowledge? What are the questions that should be addressed next?

References

Follow American Society of Microbiology format for references.
http://jb.asm.org/site/misc/journal-ita_org.xhtml - 02 (This same link, “ASM Instructions to Authors” also happens to be a good resource for how to appropriately make tables and figures, etc, for your future reference.)

□ **I will approve the topics before you write in earnest.** You will choose three possible topics and the key paper(s) that you would cover. Do NOT simply list review articles, but rather specific experimental papers. List (copy and paste) the title, authors and abstract. I will approve one of the topics and papers. You do not need to read any of these papers in the detail required to actually write your paper. Just pick papers you are interested in. I just want to ensure that you head in the right direction

□Timeline

March 4th, 5:00 PM - Turn in your topics

Papers are due May 3rd, 5:00 PM, the Friday after classes end. Papers that are turned in late will have 10% (5 points) subtracted from the total possible points.

□How to choose a topic

Go to <http://www.ncbi.nlm.nih.gov/entrez/query.fcgi?holding=uiuc>
(Or you can use Google Scholar, but the details below pertain to pubmed)

This whole process will work best with a fast internet connection. You also must have “acrobat reader.” Note that the “uiuc” stuff at the end allows automatic access to electronic journals to which UIUC subscribes.

Start by searching the topic of interest and add “review”. Strings of terms are treated independently, e.g., “growth rate regulation coli review”

Initially go through some abstracts of these reviews to find some interesting topics. Click on “Related Articles” to find papers on the subject.

You could also look through a couple of recent issues of the journal Science for some interested topics. All journals subscribed to by the UIUC can be found at:

<http://www.library.illinois.edu/> (Under the “Journals” tab.)

Methods Presentations:

In order to become more familiar with techniques utilized in research papers, students will do group methods presentations. For each class, 2-3 students will present assigned methods. Methods presented will often be pertinent to the paper discussed that week. Methods presentations should be no 5-10 minutes. When presenting the assigned methods, describe how you would do it and what the purpose is. Use diagrams if possible.

Current Event in Science:

The purpose of the current event in science is for you to think about what is currently going on scientifically and how science is perceived. Spend ~5 minutes at the beginning of class talking about something current going on in science. The current event in science can be as simple as talking about Covid-19 vaccines or a scientific breakthrough.

Homework:

There will be 12 homework exercises. The two lowest grades will be dropped. Homework will be posted on Moodle each week and can be emailed to the instructor. Homework grades can be checked on Moodle.

Extra Credit:

Extra credit opportunities will be posted throughout the semester. Most of these will be very easy and require very little effort on your part. They are due the day they are posted. Additionally, each of you can submit a 1-2 page summary of a seminar you attended during the semester for 5 extra credit points. The seminar extra credit can be submitted anytime during the semester.

Course Calendar with Daily Schedule of Topics, Readings and Assignment Due Dates

Readings for MCB297A Spring 2024

Date	Assignment
January 22	Introduction to class
January 29	Kennedy et al. (2009) Programmed Cellular Necrosis Mediated by the Pore-Forming α -Toxin from <i>Clostridium septicum</i> . PLoS Pathogens. 7:e1000516.
February 5	Pearson et al. (2023) Organ agar serves as physiologically relevant alternative for <i>in vivo</i> bacterial colonization. Infect and Immun.
February 12	Brokaw et al. (2022) A Recombinant Alpha-Like Protein Subunit Vaccine (GBS-NN Provides Protection in Murine Models of Group B <i>Streptococcus</i> Infection. JID 226:177-87.
February 19	Discuss a paper with a non-science friend and then write about it. (no class)
February 26	Noto et al. (2022) Iron deficiency linked to altered bile acid metabolism promotes <i>Helicobacter pylori</i> -induced inflammation-driven gastric carcinogenesis. J Clin Invest. 2022;132(10):e147822.
March 4	Noto et al. (2022) Iron deficiency linked to altered bile acid metabolism promotes <i>Helicobacter pylori</i> -induced inflammation-driven gastric carcinogenesis. J Clin Invest. 2022;132(10):e147822., turn in paper topics by 5 pm.
March 11	Spring Break – no class
March 18	Dong et al. (2022) The K18-Human ACE2 Transgenic Mouse Model Recapitulates Non-severe and Severe COVID-19 in Response to an Infectious Dose of the SARS-CoV-2 Virus. J of Virology.
March 25	Killingley et al. (2022) Safety, tolerability and viral kinetics during SARS-CoV-2 human challenge in young adults. Nature Medicine 28:1031-1041.
April 1	Kurz et al. (2022) Exercise-induced engagement of the IL-15/IL-15R α axis promotes anti-tumor immunity in pancreatic cancer. Cancer Cell 40:720-737.
April 8	Ten simple rules for structuring papers (no class, participation over Moodle)

April 15	Lee et al. (2022) Immunoprotecting Effects of Exercise Program against Ovarian Cancer: A Single-Blind, Randomized Controlled Trial. <i>Cancers</i> 14.
April 22	Techniques
April 29	No Class - work on final paper (I will be available for questions if needed.)
May 3	Papers are due by 5.00 pm

MCB Curriculum Policies

For non-academic campus assistance and support:

- See Office of Diversity, Equity and Access (ODEA) information at the end of this document.

Student Advocacy Resources:

- For student-centered advocacy programs and services visit: mcb.illinois.edu/undergrad/advising/resources.

Contacting MCB Course Personnel:

- MCB course personnel are more than happy to assist students.
- Emails to instructors, TAs, or course coordinators will only be answered if they come from an @illinois.edu account. We will only use this account in order to protect your educational information and profile. As a student, please remember that when you email a staff member, it is important to include all pertinent information so that we can assist you in the most efficient and effective manner possible. This information includes:
 - The course rubric in the subject line
 - Your full first and last name
 - Your NetID (the first part of your illinois.edu email account)
 - Your UIN (9 digit number that can be found on your ICard)
 - The course that you are concerned about (the course personnel often work with multiple courses)
 - Your section letter/number
 - The previous email "thread" or previous communicated information pertinent to the situation
- Your cooperation will help us respond much more quickly to your concerns.

Policies:

- Unfamiliarity with policies is not a defense for not knowing what they cover.

Adding the Course after the Semester Starts:

- We understand that the University has an add deadline 10 days into the semester, but the University lets individual courses and/or programs determine their policies for late adds. We feel that students who choose to add a course late do so at their own discretion with knowledge that there may be points lost in the process.

Religious Observances and Practices:

- Students are required to submit the Request for Accommodation for Religious Observances Form (which can be found at www.odos.illinois.edu/.../Religious_Observance_Accommodation_Request_Form.docx) to their instructors and the Office of the Dean of Students requesting accommodation by the end of the second week of the course. Requests that are not submitted within this time frame may not be granted. Information about accommodations can be found in the Student Code: <http://studentcode.illinois.edu/>.

DRES Accommodations:

- We are committed to providing a learning environment where our students can succeed. If you require special accommodations, please contact us and the Disability Resources and Educational Services (DRES) as soon as possible. To contact DRES, you may visit 1207 S. Oak Street, Champaign, call 217.333.4603, or email disability@illinois.edu. We will try to meet all accommodations once the process has started. Please note that accommodations are not retroactive to the beginning of the semester, but begin the day you contact your professor, instructor or coordinator with a current letter of accommodation from DRES.
- If a student believes that they need DRES accommodations, they should contact DRES at disability@illinois.edu.

Class Absences:

- Regular class attendance is expected of all students at the University. (http://odos.illinois.edu/studentAssistance/absence/revised_code.asp)
- If you find yourself ill, you must submit confirmation of a visit with a medical practitioner within 24 hours of your absence. The confirmation cannot be provided by a relative, even if the relative is a practitioner.
- The Office of the Dean of Students will only provide informative letters to instructors for protracted illness of 3 or more days, certain emergencies and to be present during the serious illness of immediate family members (parents, legal guardian, spouse/partner, siblings, children, or grandparents). These letters do not excuse you from class but merely provide information for the instructor to consider with regard to excusing the absence and permitting make-up work. Students must request absence

letters from the Office of the Dean of Students after the student has returned to class but not more than 10 business days after the last date of absence.

- Absences that may be excused without a letter include circumstances beyond the student's control such as medical treatment, surgery related to prolonged illness or injury, pregnancy, legal matters, citizenship or naturalization processes, or acts of nature which cause destruction to a primary residence or disrupt air travel. All will require documentation.
- Absences that may also be excused without a letter include a conference or job, graduate or professional school interviews, though a best effort should be made to schedule these events to minimize class attendance disruption. All will require documentation.
- Absences planned for the items listed in previous bullet point must be communicated to your instructor or course coordinator at least two weeks in advance of the absence. Failure to do so may result in the loss of opportunity to reschedule the missed class period and the portion of the grade associated with this class period.
- Absences that will not be excused include family events such as reunions or weddings, or presence during serious illness of extended family members (aunt, uncle, niece, nephew, or cousin).
- Unplanned absences may result in the loss of opportunity to reschedule the missed class period and, therefore, the portion of the grade associated with this class period.
- Absences will be handled according to individual course policy.

Grades:

- Each course has a grade scale. The grade you earn in the course will be based on the points that you earn. Effort is reflected in points earned. We will adhere to the grade scale when assigning grades in order to avoid capriciousness and to adhere to fairness and equity for all students.

Academic Integrity:

- The Code of Policies and Regulations Applying to All Students will be applied in all instances of academic misconduct committed by students. This applies to all exams, presentations, assignments and materials distributed or used in this course. You can review these policies at the following website: <http://admin.illinois.edu/policy/code/index.html> and specifically here: <http://studentcode.illinois.edu/article1/part4/1-401/>
- Science cannot exist without honesty. The faculty and staff in MCB require students, as scientists-in-the-making, to hold the highest standards of scientific and academic conduct. Any form of cheating on any graded work in courses is unacceptable.
- We require that all graded work be entirely your own, and that anything you write using the words of other writers be correctly attributed. Some specific points follow.
- On exams, the answers that you turn in for grading must be your own, formulated during the exam from your own understanding of the material and without any supporting information, be it written, verbal or electronic. Copying the work of another student, or allowing another to copy your work, or copying work from any

other source, is unacceptable. Since we cannot always monitor you as you complete your work, we must rely upon appearance of your work from which to judge. If the work you submit resembles that of another student or another source too closely, we may conclude that it was not your original work. Always make a conscious effort to complete your work on your own and to protect it from the view of others, in order to ensure that it will be seen as your own. Failure to adhere to these standards for any portion of an exam may result in a grade of zero for the entire exam or quiz for all persons involved.

- Texting, or the use of a cell phone or any other device for any purpose, during a quiz or exam is prohibited. Doing so may earn you a zero or a more extreme penalty on the quiz or exam at the discretion of the instructor.
- Use of any social or electronic media to share information, request information or make confidential information public is prohibited. Any use of this type may earn you a zero on the exam or a more extreme penalty at the discretion of the instructor.
- On written or electronic assignments, the answers that you turn in for grading must be written in your own words, formulated from your own understanding of the material. While you may be working with other students in the course, you must formulate and submit your own answers. Copying or paraphrasing the work of another student, or allowing another to copy or paraphrase your work, is unacceptable. Since we cannot monitor you as you complete your work, we have only the appearance of your work from which to judge. If the work you submit resembles that of another student too closely, we may conclude that it was not your original work. Always make a conscious effort to complete your work on your own and to protect it from the view of others, in order to ensure that it will be seen as your own. You must also make a conscious effort to protect your passwords and accounts. Failure to adhere to these standards may result in a grade of zero for the entire assignment for all persons involved.
- On written or electronic assignments, if you use a statement taken directly from any book or other publication, including the course textbook, you must provide a citation. That is, you must put the text in quotes and put the author of the publication in parentheses after the quotation. Failure to do so will result in zero credit for that answer. Further, using only the words of another author as your entire answer or as the majority of your answer to any question is never sufficient to earn credit. If the majority of your work has been taken directly from a publication, you are likely to receive no credit for the work, since you would not be demonstrating knowledge beyond the ability to copy. Even if you quote another, your answer must be substantially your own words, drawn from your own understanding of the material.

Student Resources/Where to go for Help:

We Care at Illinois

- For sexual misconduct support, response and prevention visit: wecare.illinois.edu

Title IX makes it clear that violence and harassment based on sex and gender are Civil Rights offenses subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, etc. If you or someone you know has been harassed or assaulted, you can find the appropriate resources here: http://oiiir.illinois.edu/sites/prod/files/SexualMisconduct_ResourceGuide.pdf

Safety and Emergency

University Police Department, Emergency, 9-911; Non-emergency, 217-333-8911

University Fire Department Emergency, 9-911

Crisis Line, 217-359-4141

Emergency Dean, 300 Turner Student Services Bldg., 610 E. John St., 217-333-0050

Counseling Center, 110 Student Services Bldg., 610 E. John St., 217-333-3704

McKinley Health Center, General Information, 217-333-2701

McKinley Mental Health Center, 1109 S. Lincoln, 217-333-2705

Dean of Students, 300 Turner Students Services Bldg, 610 E. John St., 217-333-0050

Local Sexual Assault Center, RACES, 217-384-4444

Women's Resources Center, 703 South Wright Street, 2nd Floor, 217-333-3137

Rape Crisis 24-hour Hotline, 217-384-4444

Suicide & Psychological Emergency, Suicide Prevention Team, 217-333-3704

SafeRides (free nighttime campus ride program), 217-265-RIDE (265-7433)

SafeWalks (free walking escort service by Student Patrol), 217-333-1216

Student Services and Advocacy

Office of the Dean of Students, 300 Student Services Bldg., 610 E. John St., 217-333-0050

Classroom Support, Teaching Skills, and Instructional Strategies

Center for Innovation in Teaching & Learning, 249 Armory Building, 217-333-1462

Counseling Services

Counseling Center, 110 Student Services Bldg., 610 E. John St., 217-333-3704

McKinley Mental Health Center, 1109 S. Lincoln Ave., 217-333-2701

Psychological Services Center, 3rd Floor, 505 E. Green St., 217-333-0041

Disability Services

Disability Resources and Educational Services (DRES), 1207 S. Oak St., 217-333-1970

Lesbian, Gay, Bisexual, Transgender Resource Center

LGTB Resource Center, 323 Illini Union, 1401 W. Green St., 217-244-8863

Veterans Services

Veteran Student Support Services, Office of the Dean of Students, 610 E. John St., 217-333-0050

Center for Wounded Veterans in Higher Education, 908 W. Nevada St., 217-300-3515

General Study Skills Assistance

Office of Minority Student Affairs, 130 Student Services Bldg., 610 E. John St, 217-333-0054

Office of Minority Student Affairs Tutoring Services, 701 S. Gregory Dr., Suite 1, 217-333-7547

Writer's Workshop, 251 Undergraduate Library, 1402 W. Gregory Dr., 217-333-8796

**Additional academic assistance may be available through individual departments

Health Resources

Health Education, McKinley Health Center, 1109 S. Lincoln Ave., 217-333-2701

Alcohol & Other Drug Office, 2nd Floor Counseling Center, 610 E. John St., 217-333-7557

Sexual Health Educator, McKinley Health Center, 1109 S. Lincoln Ave., 217-333-2714

Dial-A-Nurse, McKinley Health Center (24-hour), 1109 S. Lincoln Ave., 217-333-2700

Health Resource Center, McKinley Health Center, 1109 S. Lincoln Ave., 217-333-6000

Health Resource Center, Room 40 Illini Union, 1401 W. Green St., 217-244-5994

McKinley Health Center, General Information, 1109 S. Lincoln Ave., 217-333-2701

Sexual Harassment/Assault & Acts of Intolerance/Hate Crimes

Office of the Dean of Students, 300 Students Services Bldg., 610 E. John St., 217-333-0050

The Office of Diversity, Equity and Access (ODEA):

- For non-academic support visit: diversity.illinois.edu
 - Discrimination & Harassment Prevention
 - Title IX
 - Accessibility & Accommodations
 - Inclusive Illinois