

LAND ACKNOWLEDGEMENT

UBC's Point Grey Campus is located on the traditional, ancestral, and unceded territory of the xwməθkwəyəm (Musqueam) people. The land it is situated on has always been a place of learning for the Musqueam people, who for millennia have passed on their culture, history, and traditions from one generation to the next on this site.

COURSE INFORMATION

Course Title	Course Code Number	Credit Value
Contemporary Biochemical Research	BIOC 304	3

PREREQUISITES

CHEM 213

COREQUISITES

BIOC303

COURSE LOCATION AND TIME

Time (Day(s), Hour)	Room
Tue Thu 11:00-12:30	CHEM D300

COURSE CHAIR

Course Chair	Contact Details
Calvin Yip (Pronouns: he/him/his)	calvin.yip@ubc.ca

COURSE INSTRUCTOR(S)

Course Instructor(s)	Contact Details	Office Location	Office Hours
Ethan Greenblatt (Pronouns: he/him/his)	ethan.greenblatt@ubc.ca	LSC 5401	TBA



Hugh Kim (Pronouns: he/him/his)	hughkim@dentistry.ubc.ca	LSC 4303	TBA
Sheila Teves (Pronouns: she/her/hers)	sheila.teves@ubc.ca	LSC 5501	TBA
Calvin Yip (Pronouns: he/him/his)	calvin.yip@ubc.ca	LSC 5301	TBA

LEARNING OUTCOMES

This team-taught course will provide students with exposure to the latest technologies and approaches used in current biochemistry and molecular biology research. Key learning objectives include:

- Develop a solid understanding of designing experiments
- Develop proficiency in interpreting original data obtained from different biochemical and molecular biology experiments
- Be comfortable reading primary research articles

Specific topics covered in BIOC304 are listed below:

Dr. Yip (Proteostasis and the autophagy pathway)

- (a) Proteostasis, protein degradation pathways, lysosomes..... 1
- (b) Regulation of macroautophagy, autophagy assays 2
- (c) Atg proteins, ubiquitin-like conjugation pathways 2
- (d) Autophagy and human health 1

Dr. Greenblatt (Modern methods in genomics and gene expression analysis)

- (a) Introduction to modern sequencing technologies.....1
- (b) From raw sequences to assembled genomes.....1
- (c) Transcriptional control - chromatin and RNA expression.....1
- (d) Post-transcriptional control - RNA localization and modifications.....1
- (e) Translational control.....1

Dr. Kim (Cell signaling and the cytoskeleton)

- (a) Introduction to hypothesis testing; imaging proteins in cells 1
- (b) Quantifying and manipulating proteins in cells..... 1
- (c) Molecular biology of the cytoskeleton..... 1



- (d) Overview of the major cell signaling pathways 1
- (e) Platelet structure and function 1

Dr. Teves (CRISPR-Cas9 gene editing technology and applications)

- (a) Introduction to CRISPR-Cas9 1
- (b) Designing gene editing experiments with CRISPR-Cas9 1
- (c) Applications of CRISPR-Cas9 beyond gene editing 1
- (d) CRISPR-Cas9 in research part 1 1
- (e) CRISPR-Cas9 in research part 2 1

COURSE OUTLINE

BIOC304 is a lecture-based course. Two 1.5-hour lectures will be given each week. Lecture slides will be uploaded to the course Canvas site before each lecture. It is expected that students preview them ahead of class. In-person attendance of the lectures are required and lecture recordings are only available for some lectures. The instructors are not responsible for technical issues associated with recordings.

A Piazza-based online forum has been set up discussing questions that come up in the course. If used appropriately, asking and answering questions on this forum can significantly enhance learning experience. Please be respectful to others when posting questions. Please only discuss questions related to the lecture mater, class logistics, and problems sets, and keep complaints off this platform. Any concerns or suggestions about the course should be directed to the course instructors through e-mail or personal meetings. While one is encouraged to answer questions on Piazza, try to guide others to the answer as opposed to giving out the answer straight up.

COURSE SCHEDULE

C. Yip	Tuesday, January	10	
	Thursday, January	12	
	Tuesday, January	17	
	Thursday, January	19	
	Tuesday, January	24	
	Thursday, January	26	
	Tuesday, January	31	Exam #1



E. Greenblatt	Thursday, February	2		
	Tuesday, February	7		
	Thursday, February	9		
	Tuesday, February	14		
	Thursday, February	16		
	<i>Tuesday, February</i>	<i>21</i>	<i>Reading break (no class)</i>	
	<i>Thursday, February</i>	<i>23</i>	<i>Reading break (no class)</i>	
	Tuesday, February	29	Exam #2	
	H. Kim.....	Thursday, March	2	
		Tuesday, March	7	
Thursday, March		9		
Tuesday, March		14		
Thursday, March		16		
Tuesday, March		21	Exam #3	
S. Teves.....		Thursday, March	23	
	Tuesday, March	28		
	Thursday, March	30		
	Tuesday, April	4		
	Thursday, April	6		

**Exam #4 (held during final exam period
– date, time, location TBA)**

COURSE MATERIALS

There is no textbook for this course. All course material will be posted throughout the term via Canvas.

GRADING SCHEME

Category	Grade Weight
Exam #1 (Dr. Yip’s section)	25 %



Exam #2 (Dr. Greenblatt's section)	25 %
Exam #3 (Dr. Kim's section)	25 %
Exam #4 (Dr. Teves' section)	25 %

GRADING AND COURSE POLICY

1. Assessments

- There will be **four closed-book** exams to assess your understanding of the course material.
- Each exam will cover material from only **one section** and will be worth **25%** of the course grade. **The duration of each exam will be 60 minutes.**
- Exam #1, Exam #2, and Exam #3 will be held during regular scheduled lecture time in person in CHEM D300. Exam #4 will be held in person during the final exam period (location and time to be announced).
- Marks for Exam #1, Exam #2, and Exam #3 will be posted on Canvas. Exams will **not** be returned. Students can request to review their exams after exam marking is complete.
- There will be **NO** make-up/deferred exams. **Students who missed an exam because of medical, emotional, or other problems must contact the course chair (Dr. Yip – calvin.yip@ubc.ca) ASAP. All cases will be assessed by the course chair, the instructor, and the department's teaching committee. Only those who received academic concession will be granted the opportunity to take an oral make-up exam.** Otherwise, a mark of 0% will be recorded for the missed exam.
- You can access your final course grade online at the Student Service Centre after all four exams are complete and graded.

2. Examination Policies

- UBC policies will be strictly followed during the writing of exams. Refer to the [Academic Honesty and Standards section](#) in the UBC calendar for more information.
- Past examinations will **not** be made available.

Students with disabilities and ongoing medical conditions have the option to request an accommodation for the course assessments after registering with the Centre for Accessibility. If

you are eligible for exam accommodations, you will need to write your exams with the Centre for Accessibility. To book an exam, notify the course chair or instructor by email and register with the Centre for Accessibility **at least one week in advance of the midterm date, or at least 7 days before the start of the examination period for a final exam.**

If the instructor is sick: We will all do our best to stay well, but if one of the us falls ill then they will not come to class. If that happens, all efforts will be made to communicate that to students in a timely manner prior to class time, usually via an announcement in Canvas and/or through e-mail. Depending on the situation, the lecture may take place over zoom, or the class may be cancelled.

ACADEMIC MISCONDUCT

UBC and the Department of Biochemistry and Molecular Biology take the issue of academic misconduct very seriously; the honest assessment of student learning is key to both the success of the university and success for individual students. Cheating, in any form, undermines the value of a degree and can have serious consequences for your continued academic success. As such it is important to know what your responsibilities are, what constitutes misconduct and how you can avoid it. With some effort and forethought no student should ever have to find themselves facing discipline for academic misconduct; inform yourself as to the expectations placed on you and what your responsibilities are. UBC definition of academic misconduct can be found in the UBC Calendar and additional information is available in this UBC resource link.

What consequences can arise from academic misconduct?

The severity of the discipline can range from a letter of reprimand or a zero on the assignment in question all the way to expulsion from the University. Perhaps the most common outcome in these cases are grades of zero in the course in which the misconduct occurred.

EQUITY DIVERSITY AND INCLUSION (EDI) POLICIES

It is our goal that students from all diverse backgrounds and perspectives be well-served by this course, that students' learning needs be addressed both in and out of class, and diversity that the students bring to this class be viewed as a resource, strength and benefit. We make a commitment to present materials



and activities that are respectful of diversity: gender identity, sexuality, disability, age, socioeconomic status, ethnicity, race, nationality, religion, and culture. We will foster a climate within the classroom where students of diverse backgrounds and identities feel comfortable sharing their opinions and experience with varied topics throughout the class. We (like many people) are learning about diverse perspectives and identities. If something was said in class (by anyone) that made you feel uncomfortable or if you observe a situation where someone else is made to feel uncomfortable, please talk to us about it. This includes concerns about any class-related interactions that lead to feelings of exclusion or marginalization. We welcome and encourage your feedback on how we can better cultivate a sense of inclusion in our course. This can be done through meetings, email or anonymous feedback through canvas. We aim to do our best to address each situation as it arises and effect meaningful changes moving forward. For more information visit our [departmental EDI webpage](#).

STUDENT RESOURCES

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions. Details of the policies and how to access support are available on the [UBC Senate website](#).

Mental Health Resources

In case you are struggling with mental health, or are feeling stressed or anxious, [UBC Counselling services](#) provides information about a number of resources for students to use. Additionally, UBC students receive [mental health coverage of up to \\$1500](#) under the AMS Health & Dental Plan (more information about coverage [here](#)).

[Here2Talk](#) is available for BC post-secondary students to talk with trained counsellors 24/7 (via voice call or text messages). If you are a student living in UBC residence, [Counsellors in Residence](#) can also be a valuable resource to provide mental health support. If you have a UBC email address, [Therapy Assistance](#)



Online (TAO) is a free online resource that provides tools to manage stress, relationship problems, substance use, etc.

COVID RELATED POLICIES

For UBC's latest response to COVID-19, please visit covid19.ubc.ca. For our in-person meetings in this class, it is important that all of us feel as comfortable as possible engaging in class activities while sharing an indoor space. Non-medical masks that cover our noses and mouths are a primary tool to make it harder for COVID-19 to find a new host. The higher the rate of vaccination is in our community overall, the lower the chance of spreading this virus. You are an important part of the UBC community. Please arrange to get vaccinated if you have not already done so. **If you're sick, it's important that you stay home – no matter what you think you may be sick with (e.g., cold, flu, other).**

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