

# Faculty Development Plan

Name, Physiology and Developmental Biology

## Introduction

Wherever I have been, I have taken the attitude that if I help the team succeed, I will succeed. In graduate school and my postdoctoral fellowship, this meant that I was willing to help others and take on mentoring opportunities or other responsibilities in the lab. Fulfilling these responsibilities, in turn, helped my research progress, increased my ability to teach and mentor, and provided leadership opportunities. I believe that this attitude will be even more essential as a professor at BYU, an institution that has a direct and specific mission to “assist individuals in their quest for perfection and eternal life.” BYU succeeds when the graduating students leave having gained valuable skills in their chosen field, an ability to critically think about the world around them, and, most importantly, a clear vision of how the gospel fits into their expanded world view. Thus, to help BYU succeed, I need to become a leader in my field, an effective teacher in the lab and the classroom, and a positive role model for my students. The following goals are designed to help me reach these objectives.

## Teaching

### ***Self Assessment:***

My first semester teaching Cell Biology (PDBIO 360) went well. I enjoy teaching and find it to be extremely fulfilling. The students also appreciated the class, many indicating in the final review that they came into the class dreading it, but left thoroughly enjoying it. I feel that my biggest weakness as a teacher is knowing what the students already know when they come into my class to teach at the right level. I often assume they know too much, and thus start ahead of where they are. I also can improve how I incorporate gospel topics into the course. Overall, I feel like I am a good teacher and will continue to make important improvements to my teaching.

### ***Goals and Plans:***

1. **Create and implement six review assignments to increase mastery.** Students indicated in their course reviews that there was so much focus on primary literature that it detracted from the material. I plan to reduce the number of papers from 13 to 10, and replace them with review assignments with questions from the previous two weeks of class. This will allow the students to review the material, and creates a formative assignment for them to gauge their progress.
2. **Find ways to seamlessly incorporate gospel topics into class.** Incorporating gospel topics into class is essential to maximize the unique benefits of BYU. I will increase the number of gospel messages in class and identify specific examples I can use to integrate gospel topics into the material seamlessly.

- 3. Implement short writing activities throughout lectures to help improve student engagement.** I currently pose questions that I have students discuss in their groups. Although this increases the number of opportunities for students to meaningfully participate in class, I worry that the group discussion can be dominated by a few individuals. I will add writing assignments to allow every student chances to apply the material being taught to specific use cases.

### ***Progress:***

My first semester teaching Cell Biology went well. I received a 4.6 composite student rating, above the department average of 4.4 and the historical course average of 4.2. That said, there are always ways to improve. The most common student critiques centered around opportunities to participate and the lack of material review. I have addressed both these concerns in my goals. Several students also noted some minor issues in the course schedule. I had already noted these and have addressed them in the attached syllabus.

### ***Resources Needed:***

I am blessed to teach a course with strong design principles and many of the materials already prepared. Dr. Alder has been kind enough to share them with me, which has helped limit the amount of time I have had to spend generating my own materials. Thus, I have been able to focus on adapting the lectures to my style and building off of what he has done. I do not anticipate needing additional resources.

## **Scholarship**

### ***Self Assessment:***

I have developed a highly interdisciplinary research program incorporating computational, genomic and molecular techniques. I believe that this will provide many opportunities, as well as challenges, as I establish my long term research program and direction. First, my ability to analyze complex datasets has and will provide many opportunities for collaborations. The danger here is that in my eagerness to help others, I can sometimes stretch myself too thin, resulting in my own research suffering. I must find the right balance working with others while pursuing my own research interests. My interdisciplinary research also presents some problems accessing students with diverse skill sets, as the BYU department structure creates some barriers to reaching out to students in other disciplines. I will need to make a concerted effort to reach out to other programs, especially the bioinformatics major. By far my biggest concern is obtaining the funding necessary to maintain my research program. As the research community has grown, and federal funding has not, grants are increasingly difficult to acquire. I will need to find and apply for funding from as many different resources as I can.

### ***Goals and Plans:***

1. **Build a research pipeline that results in 3-4 papers per year, with 1-2 from my lab and 1-3 from collaborations.** In order to do this, I have created six major projects in my lab of varying scopes. I expect that some of these projects will be completed quickly while others will take some time. I will also continue to attend scientific conferences in my field to see the major areas of research and develop new ideas and collaborations.
2. **Increase my h-index to 10 by third year review and 12 by CFS.** It is important that I focus on both the quantity and quality of publications, the h-index requires both. My h-index when I started at BYU was a six based on eight publications. Therefore, in order to increase my h-index, I will need to publish several more quality papers.
3. **Obtain significant external funding for my research.** My research cannot be maintained over the long term without additional sources of funding. I will apply for at least 2 grants this year, one from the American Heart Association (AHA), and an R15 or R01 from the NIH. I anticipate that these grants will need to be resubmitted with revisions next year. I will also apply for two additional grants, one from the Childrens Heart Foundation and one from the AHA. Finally, I will also work with Conrad Monson to identify other private organizations that may be interested in funding my research. Future years will involve at least 3 applications per year as a PI or Co-PI to as many different sources as possible.
4. **Regularly receive external and internal funding for undergraduates in my lab.** One of the strengths of BYU is the mentoring opportunities for undergraduates. In addition to the ORCA grants available through the university, students in my lab will be eligible for summer fellowships from the AHA. I will have students apply for both of these programs each year.
5. **Create a strong mentoring program in my lab that helps undergraduate and graduate students become productive scientists.** For my research program to succeed, it is essential that my students become productive scientists. I cannot do it on my own. I will implement regular opportunities for students to self evaluate and/or be evaluated by me to measure their progress in the lab, including both written assignments and interviews. I will also continue to adapt my lab organizational structure to identify the most productive model for my specific needs.

### ***Progress:***

My research is already underway in my lab. Thanks in large part to the help of Arminda Suli, I was able to get my fish facility up and running smoothly. I now have 15 students working in the lab. They have been divided into teams, with each team working on a specific project. We have regular lab meetings, which alternate between reviews of papers relevant to our research and reports by the students on their progress. I also implemented a mid-term and end-of-term interview with each student where we

discuss their progress. In addition to my own research, I have published as a collaborator on a paper with Jeff Tessem in the nutrition department and with Amnon Schlegel at the University of Utah. I am currently finishing a manuscript for my own research that will be submitted this summer.

### ***Resources Needed:***

The university has provided a start up package that is tight, but workable. I have all of the equipment I expect I will need in the lab, and the college and university have plenty of computational resources. The only areas of concern are long-term data storage for my genomic datasets and consistent labor in the lab. Discussions are ongoing in the college and department to provide these resources. Overall, the university has been very supportive of my research.

## **Citizenship**

### ***Self Assessment:***

My goal at BYU is not only to succeed, but to help the university succeed. This will require me to do my best to establish myself as a leader in my field, to collaborate both inside and outside of BYU, and to serve on department committees. Over my career, I believe that I have made good connections with my peers in the developmental biology and heart communities. I have also established several collaborations here at BYU. However, I have not made enough connections in the bioinformatics and statistics groups here at BYU. Building these connections will help me expand my research capabilities as I develop novel analysis techniques. I also believe that getting involved in the publication and grant review processes will help me as I strive to fund and publish my own research.

### ***Goals and Plans:***

1. **Continue actively participating in the B2B consortium.** The B2B consortium is an NIH funded group of researchers seeking to use a combination of human genetics and model organism genomics to gain insights into the causes of congenital heart defects. As a postdoctoral fellow, I served on the bioinformatics committee, giving me many opportunities to work with some of the leaders in my field. Even though I am now here at BYU, I have been asked to continue to participate in the consortium. This will pay for many of my sequencing experiments, and will continue to give me chances to work with others outside of BYU.
2. **Review 2-3 articles per year.** I have decided to create this goal out of a need for finding balance. I look forward to reviewing articles in my field, as it helps other researchers publish good work, and helps me see the latest advancements and keep my critical eye sharp.

3. **Participate in the Early Career Reviewer (ECR) program.** The ECR program is an NIH initiative to allow young investigators to participate in grant review study sections. Participating in this program will help me see how the review process works, aiding my own grantsmanship, and build relationships with others in my field. The program requires that I have two publications as an independent researcher, so I will apply once this criterion is met.
4. **Actively serve on the PDBIO curriculum committee and review ORCA grant applications.** My department citizenship assignments include serving as a member on the department curriculum committee and to review ORCA grant applications each fall. I will actively participate in both of these assignments.

### ***Progress:***

I have established several collaborations within my department, with faculty members of the Nutrition and Chemical Engineering Departments, and outside of the university. I am also an active member of the Curriculum Committee. As part of this assignment, I have helped review the Learning Objectives Document for the PDBIO department, and have accepted an assignment to review the graduate curriculum for the PDBIO program. This review will be completed this summer.

### ***Resources Needed:***

I do not anticipate that any resources will be needed.

## **Conclusion**

The above goals in teaching, scholarship and citizenship are designed to address my weaknesses and build on my strengths as I learn and grow into my position here at BYU. My teaching goals will help me hone my skills as an instructor. My scholarship goals are centered around establishing a strong and consistent research pipeline. And my citizenship goals will help me stay actively involved in the BYU and scientific communities of which I am a part. Thus, these goals will work together to help me become a role model and scholar who can “assist students on their quest for perfection and eternal life.”

## **Scholarship Strategies Project**

I have developed a highly interdisciplinary research program incorporating computational, genomic and molecular techniques. I believe that this will provide many opportunities, as well as challenges, as I establish my long term research program and direction. First, my ability to analyze complex datasets has and will provide many opportunities for collaborations. The danger here is that in my eagerness to help others, I can sometimes stretch myself too thin, resulting in my own research suffering. I must find the right balance working with others while pursuing my own research interests. My interdisciplinary research also presents some problems accessing students with diverse skill sets, as the BYU department structure creates some barriers to reaching out to students in other disciplines. I will need to make a concerted effort to reach out to other programs, especially the bioinformatics major. By far my biggest concern is obtaining the funding necessary to maintain my research program. As the research community has grown, and federal funding has not, grants are increasingly difficult to acquire. I will need to find and apply for funding from as many different resources as I can.

### ***Goals:***

1. Submit three grant applications (two to the American Heart Association, one to the NIH).
2. Work with students to submit 6 undergraduate fellowship applications (ORCA and American Heart Association).
3. Submit one publication from my lab for review/publication.
4. Have students present their research at a meeting.

### ***Strategies:***

My goals will require extensive writing. Therefore, my goals will center around creating regular time for writing and creating opportunities for students to present.

1. Set aside regular protected time for writing (Monday – Thursday 8-10 am).
2. Set aside regular time (Friday mornings from 8-10 am) for conducting literature searches.
3. Take students to the Society for Developmental Biology Southwest Regional Meeting.

### ***Evaluation:***

All of these goals have clearly measurable outcomes. It basically boils down to physically turning something in. I will discuss the submitted applications and publications, as well as the student presentation at the southwest meeting with my department chair.

## Citizenship Project

My goal at BYU is not only to succeed, but to help the university succeed. This will require me to do my best to establish myself as a leader in my field, to collaborate both inside and outside of BYU, and to serve on department committees. Over my career, I believe that I have made good connections with my peers in the developmental biology and heart communities. I have also established several collaborations here at BYU. However, I have not made enough connections in the bioinformatics and statistics groups here at BYU. Building these connections will help me expand my research capabilities as I develop novel analysis techniques. I also believe that getting involved in the publication and grant review processes will help me as I strive to fund and publish my own research.

### *Goals/Activities:*

1. **Participate in at least two graduate committees.** This will help me develop opportunities for collaboration and expand my horizons in my field.
2. **Review 2-3 journal articles.** This will provide me opportunities to stay up to date on developments in my area of research and improve my own paper submissions.
3. **Continue to actively participate on the curriculum committee.** Work in this area will help my ability, and the department as a whole, improve how and what we teach the students.
4. **Organize a brown-bag lunch for members of Life Sciences to meet with members of the statistics department to identify potential areas of collaboration.** This activity will help build a bridge between departments in different colleges to advance research in both fields.

# PDBIO 360 - Cell Biology

Fall 2016 Section 002: W111 BNSN on M W from 4:00 pm - 5:50 pm

## Instructor/TA Info

### Instructor Information

Name: Name

Office Location: LSB 3018

Office Phone: 801-422-8970

Email: jhill@byu.edu

**Office Hours: Thu 2:00pm-4:00pm, or by appointment**

### TA Information

Name: Trisha Wheelwright

Office Location:

Email: trishalynn.wheels@gmail.com

**Office Hours:**

Name: Christian Carr

Office Location:

Email: christianlcarr8@gmail.com

**Office Hours:**

## Course Information

### Overview

The purpose of PDBIO 360 is to help you learn the foundational concepts and develop the critical thinking skills necessary to analyze and interpret cell biology data throughout your schooling and career.

The overarching idea here is that much of the details or “facts” that you will learn in this class will be updated or changed as the field progresses. Therefore, *merely* memorizing facts fails to prepare you for your career. Think of a cancer doctor at the end of his/her career. How much does cancer treatment today resemble treatment in 1980, when they likely graduated medical school? There is much greater benefit in building the foundation that will allow you to continue to learn throughout your schooling and career. This, in turn, involves learning the vocabulary and basic concepts underlying various cell functions, and then adding on top of that the critical thinking skills necessary to assimilate new information to strengthen and improve that model.

In order to accomplish this goal, approximately 60% of the class will be dedicated to mastering the vocabulary and base concepts in cell biology, including how proteins are made, transported and degraded, and how cell accomplish various tasks such as growing, moving, dividing and dying. The other 40% of the course will be dedicated to learning how to

critically analyze the primary literature, design and interpret experiments, and to synthesize multiple concepts to create novel hypotheses. Tests and other assignments are also designed around these concepts. For example, approximately 40% of test questions will be data interpretation style questions.

PDBIO 360 is not an easy course. It takes consistent hard work to understand the material and complete the assignments. However, you can succeed if you put in the effort to learn. I have found that successful students generally do the following:

1. Attend *and actively participate* in every class
2. Are active members of their groups
3. Go to office hours with questions
4. Prepare for class by reading the notes or paper ahead of time

The key to this course is to take responsibility for your own education. I am here to help, but I can't if you don't come to me first. As Dumbledore said, "Help will always be given at {BYU} to those who ask for it."

## Prerequisites

Molecular Biology (MMBIO 240) is HIGHLY recommended.

## Materials

The material in this class represents the latest and most up-to-date information possible. Informational material will be provided through PowerPoint presentations with notes. Pay attention to these notes, as they will contain important information that may not be covered in depth in class. You will be responsible for any information in the slides and/or slide notes. The recommended text *Molecular Biology of the Cell* is available on course reserve in the library. It is a great resource for further reading, especially if you are struggling to master a particular concept. Relevant readings in this text can be found in the class schedule.

A large part of this course will involve reading the primary literature. Papers assigned in this class will be provided through Learning Suite. It is up to you to decide if you want to read them electronically or to print them out.

## Classroom Procedures

The course is organized on a weekly cycle of activities that are designed to take advantage of the team-based learning format. During the second week, you will be divided into groups of 4-5. These groups will remain the same throughout the semester. You **cannot** change groups. Each class will start with approximately 40-50 minutes of lecture/discussion on the designated topic of cell biology. During these sessions, there will be many opportunities to participate in discussions with your group members, so plan on sitting with your group everyday. The second hour of class on Wednesdays will be used to discuss a paper or a review of the last two weeks of material. The second hour the following Monday will be used for group work on the assignment, which will be due the following Wednesday.

## Grading Policy

The grading scale in this syllabus is the maximum scale that will be used. I reserve the right to lower it if I deem it necessary. All adjustments to the grading scale will be at my sole discretion. *Late Assignments will incur a 25% penalty if one day late, and a 50% penalty thereafter. Class participation assignments and tests cannot be turned in late without a note from your doctor or the disabilities office.*

**Grades will be determined as follows:**

**Problem Sets (20%):** Problem Sets will be due in class every Wednesday. There are two types of problem sets. Paper problem sets consist of four questions and are based on the primary article assigned previously, except for question 4, which contains new data and a novel question. The style of question is retained every week. Each answer should be written on a separate piece of paper and turned in during class on Wednesday (no exceptions). Paper problems sets are done as groups and members of the group will share the same score. Six review problem sets will also be given. They will consist of two open-ended questions from each lecture and are designed to make you synthesize and apply the material learned.

**Midterms (40%):** There will be three midterms given in the testing center. Each will contain multiple choice questions from topics discussed in lectures. Each Midterm will cover roughly 8 lectures of material and will not be comprehensive.

**Final Project (10%):** The final project will consist of a paper with a problem set similar to the problem sets done in your groups. However, this assignment must be done on your own.

**Final Exam (20%):** The final will be given in the testing center during finals week and will have two sections. One will be similar to the midterms, with questions from the last three lectures of class. The rest of the final will be comprehensive.

**Group Participation (5%):** Participation score will be determined by your group members at the end of the semester.

**Class Participation (5%):** There will be five short writing assignments during class randomly throughout the semester. These will be collected and scored for your participation grade.

## Participation Policy

Students will organize themselves into groups of 4-5. Each student is required to be an active part of their group. Group members will score each other at the end of the semester and these scores will be used to determine the participation score for each student (see grading policy).

## Attendance Policy

Attendance in class is not required. However, last semester I correlated attendance with midterm performance and found a very strong correlation. All material on the midterms and

Grades	Percent
A	93%
A-	90%
B+	87%
B	83%
B-	80%
C+	77%
C	73%
C-	70%
D+	67%
D	63%
D-	60%
E	0%

final exam will be covered in class. Not attending class will likely significantly hurt your performance in the class and ability to master the material.

Being absent does not excuse you from turning in assignments. Late Assignments will incur a 25% penalty if one day late, and a 50% penalty thereafter. Class participation assignments and tests cannot be turned in late without a note from your doctor or the disabilities office. If you know you will be absent, coordinate with your group and/or me to make sure the assignment is turned in.

## University Policies

### Honor Code

In keeping with the principles of the BYU Honor Code, students are expected to be honest in all of their academic work. Academic honesty means, most fundamentally, that any work you present as your own must in fact be your own work and not that of another. Violations of this principle may result in a failing grade in the course and additional disciplinary action by the university. Students are also expected to adhere to the Dress and Grooming Standards. Adherence demonstrates respect for yourself and others and ensures an effective learning and working environment. It is the university's expectation, and every instructor's expectation in class, that each student will abide by all Honor Code standards. Please call the Honor Code Office at 422-2847 if you have questions about those standards.

### Sexual Misconduct

As required by Title IX of the Education Amendments of 1972, the university prohibits sex discrimination against any participant in its education programs or activities. Title IX also prohibits sexual harassment-including sexual violence-committed by or against students, university employees, and visitors to campus. As outlined in university policy, sexual harassment, dating violence, domestic violence, sexual assault, and stalking are considered forms of "Sexual Misconduct" prohibited by the university.

University policy requires any university employee in a teaching, managerial, or supervisory role to report incidents of sexual misconduct that come to their attention through various forms including face-to-face conversation, a written class assignment or paper, class discussion, email, text, or social media post. If you encounter sexual misconduct, please contact the Title IX Coordinator at [t9coordinator@byu.edu](mailto:t9coordinator@byu.edu) or 801-422-2130 or Ethics Point at <https://titleix.byu.edu/report-concern> or 1-888-238-1062 (24-hours). Additional information about Title IX and resources available to you can be found at <http://titleix.byu.edu>.

### Student Disability

Brigham Young University is committed to providing a working and learning atmosphere that reasonably accommodates qualified persons with disabilities. If you have any disability which may impair your ability to complete this course successfully, please contact the University Accessibility Center (UAC), 2170 WSC or 422-2767. Reasonable academic accommodations are reviewed for all students who have qualified, documented disabilities. The UAC can also assess students for learning, attention, and emotional concerns. Services are coordinated with the student and instructor by the UAC. If you need assistance or if you feel you have been unlawfully discriminated against on the basis of disability, you may seek

resolution through established grievance policy and procedures by contacting the Equal Employment Office at 422-5895, D-285 ASB.

## Academic Honesty

The first injunction of the Honor Code is the call to "be honest." Students come to the university not only to improve their minds, gain knowledge, and develop skills that will assist them in their life's work, but also to build character. "President David O. McKay taught that character is the highest aim of education" (The Aims of a BYU Education, p.6). It is the purpose of the BYU Academic Honesty Policy to assist in fulfilling that aim. BYU students should seek to be totally honest in their dealings with others. They should complete their own work and be evaluated based upon that work. They should avoid academic dishonesty and misconduct in all its forms, including but not limited to plagiarism, fabrication or falsification, cheating, and other academic misconduct.

## Mental Health Concerns

Mental health concerns and stressful life events can affect students' academic performance and quality of life. BYU Counseling and Psychological Services (CAPS, 1500 WSC, 801-422-3035, caps.byu.edu) provides individual, couples, and group counseling, as well as stress management services. These services are confidential and are provided by the university at no cost for full-time students. For general information please visit <http://caps.byu.edu>; for more immediate concerns please visit <http://help.byu.edu>.

## Plagiarism

Intentional plagiarism is a form of intellectual theft that violates widely recognized principles of academic integrity as well as the Honor Code. Such plagiarism may subject the student to appropriate disciplinary action administered through the university Honor Code Office, in addition to academic sanctions that may be applied by an instructor. Inadvertent plagiarism, which may not be a violation of the Honor Code, is nevertheless a form of intellectual carelessness that is unacceptable in the academic community. Plagiarism of any kind is completely contrary to the established practices of higher education where all members of the university are expected to acknowledge the original intellectual work of others that is included in their own work. In some cases, plagiarism may also involve violations of copyright law. Intentional Plagiarism-Intentional plagiarism is the deliberate act of representing the words, ideas, or data of another as one's own without providing proper attribution to the author through quotation, reference, or footnote. Inadvertent Plagiarism-Inadvertent plagiarism involves the inappropriate, but non-deliberate, use of another's words, ideas, or data without proper attribution. Inadvertent plagiarism usually results from an ignorant failure to follow established rules for documenting sources or from simply not being sufficiently careful in research and writing. Although not a violation of the Honor Code, inadvertent plagiarism is a form of academic misconduct for which an instructor can impose appropriate academic sanctions. Students who are in doubt as to whether they are providing proper attribution have the responsibility to consult with their instructor and obtain guidance. Examples of plagiarism include: Direct Plagiarism-The verbatim copying of an original source without acknowledging the source. Paraphrased Plagiarism-The paraphrasing, without acknowledgement, of ideas from another that the reader might mistake for the author's own. Plagiarism Mosaic-The borrowing of words, ideas, or data from an original

source and blending this original material with one's own without acknowledging the source. Insufficient Acknowledgement-The partial or incomplete attribution of words, ideas, or data from an original source. Plagiarism may occur with respect to unpublished as well as published material. Copying another student's work and submitting it as one's own individual work without proper attribution is a serious form of plagiarism.

## Respectful Environment

"Sadly, from time to time, we do hear reports of those who are at best insensitive and at worst insulting in their comments to and about others... We hear derogatory and sometimes even defamatory comments about those with different political, athletic, or ethnic views or experiences. Such behavior is completely out of place at BYU, and I enlist the aid of all to monitor carefully and, if necessary, correct any such that might occur here, however inadvertent or unintentional. "I worry particularly about demeaning comments made about the career or major choices of women or men either directly or about members of the BYU community generally. We must remember that personal agency is a fundamental principle and that none of us has the right or option to criticize the lawful choices of another."

President Cecil O. Samuelson, Annual University Conference, August 24, 2010

"Occasionally, we ... hear reports that our female faculty feel disrespected, especially by students, for choosing to work at BYU, even though each one has been approved by the BYU Board of Trustees. Brothers and sisters, these things ought not to be. Not here. Not at a university that shares a constitution with the School of the Prophets." Vice President John S. Tanner, Annual University Conference, August 24, 2010

Date	Hour 1	Hour 2	Assignment Due
29-Aug Monday	Course Introduction	How to read a paper	
31-Aug Wednesday	Methods in Cell Bio 1: Microscopy	Working in groups	
7-Sep Wednesday	Methods in Cell Bio 2: Molecular Methods	Paper 1	
12-Sep Monday	Membranes/Compartmentalization of the cell	Group Work: Problem Set 1	
14-Sep Wednesday	The Nucleus: Nuclear Organization	Review 1	Paper 1 Problem Set
19-Sep Monday	The Nucleus: Transcriptional Regulation		
21-Sep Wednesday	The Nucleus: Nuclear Transport	Paper 2	Review 1 Problem Set
26-Sep Monday	The Mitochondria	Group Work: Problem Set 2	
28-Sep Wednesday	Protein Synthesis and Degradation: Translation and Ubiquitination	Review 2	Paper 2 Problem Set
3-Oct Monday	Protein Export: Endoplasmic Reticulum	Paper 3 (On Midterm)	
5-Oct Wednesday	Protein Export: Vesicle Budding	Paper 4	Review 2 Problem Set
10-Oct Monday	Protein Export: Vesicle Fusion	Group Work: Problem Set 4	
12-Oct Wednesday	Protein Export: Glycosylation and Golgi Transport	Review 3	Paper 4 Problem Set
17-Oct Monday	Protein Import: Endocytosis		
19-Oct Wednesday	Protein Import: Phagocytosis and Pinocytosis	Paper 5	Review 3 Problem Set
24-Oct Monday	Cytoskeleton: Microfilaments (actin)	Group Work: Problem Set 5	
26-Oct Wednesday	Cytoskeleton: Microtubules	Review 4	Paper 5 Problem Set
31-Oct Monday	Cytoskeleton: Intermediate Filaments and membrane skeleton	Paper 6 (On Midterm)	
2-Nov Wednesday	Cell Function: Adhesion	Paper 7	Review 4 Problem Set
7-Nov Monday	Cell Function: Molecular Motors	Group Work: Problem set 7	
9-Nov Wednesday	Cell Function: Motility	Review 5	Paper 7 Problem Set
14-Nov Monday	Cell Function: Polarity		
16-Nov Wednesday	Cell Cycle 1: Cycle Control	Paper 8	Review 5 Problem Set
21-Nov Monday	Cell Cycle 2: Mitosis	Group Work: Problem Set 8	
28-Nov Monday	Signal Transduction 1	Review 6	
30-Nov Wednesday	Signal Transduction 2	Paper 9 (On Midterm)	Paper 8 Problem Set
5-Dec Monday	Apoptosis		Review 6 Problem Set
7-Dec Wednesday	Applications of Cell Biology		Final Project due December 9 at 5:00 pm