Bio12: Cell Structure and Function

Fall 2018

M, W, F 8:50-9:55 AM
X-hour, when used: Th 9:05-9:55 AM
Room 200, Life Sciences Center (LSC)
Instructor: Prof. Roger Sloboda
Lab Instructor: Dr. Katie Price
Teaching Science Fellow: Scott Grubman
Graduate Teaching Assistants: Chris Geiger, Marina Kirkland, Hoon Lee, Zach Spencer, Tamar Wheeler

“A scholar approaches a task for the sake of himself or herself, not for that of someone else, as the schoolgirl or schoolboy does.” -George Herbert Palmer, ~1912, as quoted in The Secret History of Wonder Woman by Jill Lepore (quote updated ever so slightly, yet importantly, by Prof. S.)

Bio 12 Learning Objectives:

1. Learn the vocabulary of cell biology and become conversant with its use.

2. Understand the structure and function of the basic components of eukaryotic cells (i.e. cells with nuclei) including molecules, macromolecules, membranes, organelles, and the soluble components of the cytoplasm.

3. Learn how cells are viewed and studied, including approaches from the fields of microscopy, biochemistry, molecular biology, and genetics (note that prior knowledge of any of these fields is not required to be successful in Bio 12).

4. Understand how the cell is organized (the interplay between cytoskeleton, organelles and membranes), produces energy (glycolysis, mitochondria and chloroplasts) divides (mitosis), moves (cilia, flagella, amoeboid movement, and motility of intracellular particles), and communicates with the outside world (membrane receptors and signal transduction).

5. Be able to apply this information to experimental settings in which one or another of the above (i.e. #4) are altered (either by the environment, mutation, drugs, experimental manipulation, or disease) and predict a logical outcome.

Office Hours:

Prof. Sloboda will hold office hours on Wednesdays from 3 – 5 PM and Thursdays from 2 – 4 PM in LSC 222. He will also be available most of the day on the Tuesdays prior to exams. In addition, please feel free to contact him if you would like to chat about something alone, or if the times above are not convenient for you. He will do his best to accommodate your needs.

Scott Grubman, our Teaching Science Fellow, will hold review sessions as follows:

Weeks with no exam: Sunday 8 – 9 PM and Thursday 7 – 8 PM (location TBD)
Weeks with exams: Sunday 8 – 9 PM and Tuesday 7 – 8 PM (location TBD)

Scott’s office is 123 LSC (email: Scott.M.Grubman@dartmouth.edu). Should you wish to meet with Scott either individually or as a group, please sign up for a time at http://calendly.com/scott-grubman.
The lab TAs will announce their office hours and contact information in their respective lab sections.

If Prof. Sloboda’s office hours become crowded, we may move to another room in the LSC. If this happens, he will put a note on his office door redirecting you. If a conflict arises and he is unable to hold office hours, he will reschedule that time and let everyone know via e-mail and/or an announcement in class. Note also that he is generally available before and after class, unless he is running to or arriving from a meeting. The scheduled optional review sessions are also good times to have your questions answered.

→ Even if you have no questions, it is a good idea to attend those sessions for practice, i. e. try answering yourself the questions other people ask as a kind of self-check for how you are doing.

Also, by hearing the other questions that are asked, you will realize others may have the same misunderstanding about the material that you do, i. e. that you are not alone! Finally, it is very, very important that you get your questions answered in a timely fashion. Thus, Prof. S. is happy to meet at other times if he is free, via a pre-arranged appointment, or you can post a question, anonymously if you wish, to him (and the rest of the class, again, anonymously) via Piazza (you can find a link to this site on the left side of the course home page on Canvas). Piazza will be monitored by Scott, the TAs, and Prof. S. We will respond to questions posted on Piazza as quickly as possible. Note, however, that we may not answer a Piazza question if the response needed would be too complex to type, in which case we will figure out another way to get your question(s) answered.

CLASS SCHEDULE

How do we view cells?

1. W 9/12 Course Logistics & Introduction to Cell Architecture Chapter 1

   Please note: There is material on Canvas providing background information on the basic chemistry you all should know in order to be successful in Bio 12. I strongly urge all of you, even if you feel confident with chemistry, to look over this material during the first week of class, and come to office hours and/or the optional review session next week if you have any questions or concerns. All of the classes in the list below (class 4 and beyond) will assume mastery of this basic knowledge.

2. Th 9/13 Microscopy I Chapter 18
3. F 9/14 Microscopy II Chapter 18

How do we analyze cells?

4. M 9/17 Protein Structure & Function Chapter 2
5. W 9/19 Experimental Approaches I Chapter 18
   Th 9/20 Optional Review with practice questions
6. F 9/21 Experimental Approaches II Chapter 18

How are cell compartments built?

7. M 9/24 Thermodynamics & Enzymes Chapter 3
8. W 9/26 Membrane Composition and Structure Chapter 4
9. Th 9/27 Transport Across Membranes I Chapter 4
9. F 9/28 Transport Across Membranes II Chapter 4

M 10/1 Optional Pre-Exam Review/Q & A
How do cells generate and utilize energy?

11. Th 10/4 Glycolysis & Aerobic Respiration Chapters 3, 5
12. F 10/5 Chloroplasts and Photosynthesis Chapter 6

How do proteins know where to reside and function in the cell?

13. M 10/8 Protein Sorting I Chapter 8
14. W 10/10 Protein Sorting II Chapter 8
   Th 10/11 Group discussion of a paper from the literature: KDEL, the ER retention signal
15. F 10/12 Protein Sorting III Chapter 8

How do cells receive, integrate and process information?

16. M 10/15 Signal Transduction I Chapter 15
17. W 10/17 Signal Transduction II Chapter 15
18. Th 10/18 Optional Review/Q & A
19. F 10/19 Signal Transduction III Chapter 15
   M 10/22 Optional Pre-Exam Review/Q & A

W 10/24 EXAM 2, 8:00-9:50 AM, Emphasis on Classes #11-19; please note the start time for this exam, and the room location: Oopik Auditorium.

How do cells regulate cell shape and motility and interact with other cells to form tissues?

20. Th 10/25 Cytoskeleton – Intermediate Filaments; Tissues Chapter 7 & 9
21. F 10/26 Cytoskeleton – Actin I Chapter 9
22. M 10/29 Cytoskeleton – Actin II Chapter 9
23. W 10/31 Cytoskeleton – Microtubules I Chapter 9
   Th 11/1 Optional Review/Q & A
24. F 11/2 Cytoskeleton – Microtubules II, and group discussion of a paper from the literature: the bacterial cytoskeleton Chapter 9

How do cells reproduce?

25. M 11/5 The Cytoskeleton in Action during Cell Division Chapter 14
26. W 11/7 The Cell Cycle I
27. Th 11/8 Group discussion of a paper from the literature: the discovery of cyclin, a Nobel Prize winning experiment Chapter 14
28. F 11/9 The Cell Cycle II Chapter 14

What happens when cell biology fails to operate properly?

29. M 11/12 What happens when cell systems fail? Chapter 16

Optional Final Exam Review Session ➔ TBA

FINAL EXAM, SUNDAY, 11/18: 8:00-11:00 AM, Emphasis on Classes #20-29; room to be assigned
Once again, some resources for assistance with class material:

1. Office hours (see page 1).

2. X-hour question answering sessions with Prof. Sloboda: Come to these sessions (1) and answer the questions posed by Prof. S., and also come with a list of questions to ask so that you understand the material as the course progresses. Never wait until just before an exam to obtain answers; if you do, you will likely have become hopelessly overwhelmed and frustrated by then. The best way to do well is to stay current with the material.

2. Ask questions. If you would like to ask a question outside of class/office hours, please use Piazza. You can find a link on the left side of the course page on Canvas; the first time you will be prompted to set up a username and password. You can post questions to the thread anonymously if you wish (anonymous to the class but not to me), and you can also answer student questions yourself, also anonymously (this is a good thing to do if you know the answer; note that one of us will confirm student answers as being correct, etc.). Please check the thread before posting a question, as your question may have already been asked (this is why we will not respond to questions of a general nature posed by regular e-mail, so as not to have to answer the same question many times over). If your question requires a great deal of information in the response, or if it would be difficult to type a coherent answer, we may ask you to come to office hours or see one of us before or after class instead. We may also address such questions during class time.

3. Scott, our teaching science fellow, having taken Bio 12 very recently, is a great source of information about course content, etc. as well.

4. Course Teaching Assistants: Your lab TA is a Ph.D. student in the Molecular and Cellular Biology graduate program and thus is also an excellent resource for information.

5. Review previous class sessions. Each class session, including review sessions, will be recorded, and these will be available via the Echo360 link on the course page in Canvas.

6. Join a study group through the Academic Skills Center, or form your own.

7. Come to review sessions, office hours, etc. and ask, hear, respond etc. to the give and take that occurs.

Textbook – *Cell and Molecular Biology*, by Gerald Karp, 7th or 8th edition

Cell and Molecular Biology: Concepts and Experiments, 8th Edition (7th Edition is OK as well) by Gerald Karp et al. The text is suggested for those who wish one, but it not required.

There are only two options for this textbook in the 8th edition version:

1. Loose-leaf (ring binder) version  
   ISBN: 978-1-118-88614-4  
   832 pages  
   $115.62 at Amazon

2. E-text  
   ISBN: 978-1-118-88384-6  
   832 pages  
   ~$83.60 at Amazon
An important note about the textbook:

It is not required.

Everything you need to know will be covered in class. Prof. S. does not look through the text for obscure bits of information and then ask you questions about these on exams. Use the text, if you purchase one, as a reference to enhance and clarify your understanding of the material we discuss in class. Also, please note the following: If you intend to apply to med school, vet school or graduate school, then you may find having the text will be useful as a familiar source of information when you begin to review what you have learned in preparation for the MCAT or GRE exams.

Additional Textbooks on Reserve

For those wishing to supplement the lectures and the assigned readings in Karp, a number of other cell biology textbooks are on reserve in Dana Biomedical Library, 37 Dewy Field Road. The list can be found here: <http://libcat.dartmouth.edu/search/p?SEARCH=grotz>.

Grading

Exam 1 100 pts
Exam 2 100 pts
Final Exam 100 pts
Lab grade 100 pts
Writing Assignments 50 pts
Class participation 50 pts

Exams will include a mixture of testing your mastery of the information and applying your knowledge to new situations and asking you to predict an outcome. Before each exam Prof. S. will post questions and answers from previous exams on Canvas to give you an idea what to expect.

Barring documented illness, failure to take an exam (or attend a lab section, see more below) at the scheduled time will result in a grade of zero.

➔ Important information about grades in Bio 12:

You are not competing against each other for grades in Bio 12. Let me be very clear about that and reiterate this point: You are not competing for grades in this class with anyone but yourself. All grades, up until the final letter grades are decided, are recorded as numerical grades, from 0% to 100%. We do not assign letter grades to individual exams, as there are other component that determine the final letter grade, in addition to the exam grades.

Here are three important points to note about grades in Bio 12:

[i] A grade of 90% or above will always be at least an A-. No one is ever penalized for learning the material. Thus, it is entirely possible for everyone in the class to receive a grade of A- or A, if everyone in the class scores a grade of 90% or greater on an exam. However, my experience suggests to me that this will not happen (see page 9 of this syllabus).

[ii] In order to receive a D, you have to achieve a final grade of at least 50%. In other words, a final grade less than 50% is an E, as is a grade of less than 50% on an exam.
This next point is really important, and note that it has two parts:

[iii] The median grade [for both sections of Bio 12, although the exams for each section of Bio 12 are different and are graded independently of each other] will be a B.

a. This statement means that if the median of an exam is 62%, then a grade of 62% for that exam would be equivalent to a B. If the median is 29%, then a grade of 29% for that exam is a B. Note, therefore, that part (a) of rule [iii] negates rule [ii] above.

b. If the median grade is 94% then a grade of 94% for that exam is an A/A-. Note, therefore, that part (b) of rule [iii] negates rule [iii] itself.

A word about the meaning of the word ‘median’. The median grade in a grade distribution is that grade above which half the class scored and below which half the class scored. Thus, the median of this grade distribution, 47, 55, 59, 76, 82, 90, 94, is 76. The mean (i.e. the average), however, is 71.9. The median of 27, 31, 59, 76, 76, 82, is also 76; the mean for this distribution is 61.0. Sorry, but every term, some students have a tough time interpreting what is meant by the term “median grade.”

Here is a list of the grade distribution for a recent fall offering of Bio 12 (50 total):

<table>
<thead>
<tr>
<th>Grade</th>
<th>Count</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>17</td>
</tr>
<tr>
<td>A-</td>
<td>3</td>
</tr>
<tr>
<td>B+</td>
<td>2</td>
</tr>
<tr>
<td>B</td>
<td>20</td>
</tr>
<tr>
<td>B-</td>
<td>4</td>
</tr>
<tr>
<td>C+</td>
<td>1</td>
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<tr>
<td>C</td>
<td>2</td>
</tr>
<tr>
<td>C-</td>
<td>0</td>
</tr>
<tr>
<td>D</td>
<td>0</td>
</tr>
<tr>
<td>E</td>
<td>1</td>
</tr>
</tbody>
</table>

In this distribution, the median is 3.0 (B), and the mean is 3.3 (B+). 84% of the class received a grade of B or better.

Finally, audio and video recordings of each class will be available, accessed via the Echo360 link on the Bio 12 Canvas page. This means the slides and associated clicker questions, accompanied by the audio portion of class, will be available on Canvas for you to re-review when you are studying.

Class Participation:

Class participation will be assessed as follows. For in class questions related to the material being covered, you will need to have a computer, a tablet, or a cell phone. Your device must be rigged to interact with a program called Poll Everywhere. Once set up, you can use your laptop, tablet, or phone to answer questions during class. Your responses to questions posed in class will be used to assess class participation, as well as provide you with practice thinking about and answering questions. Note that I will not be tracking whether you answer a question right or wrong, only whether or not you participated by providing an answer. With respect to the Honor Principle, it is a clear violation to bring someone else’s computer, tablet, or phone to class for them, and use it to provide answers as if the person were present. It is also a violation to provide, remotely, answers for yourself or anyone else from some position in the known universe other than the Bio 12 classroom.

To use Poll Everywhere, the first step is to set up a Poll Everywhere account prior to class on Thursday the 13th. To do this log into https://www.polleverywhere.com/login with your Dartmouth email address and follow the prompts. You cannot register using anything other than Your.Name@Dartmouth.edu for an email address.

Next, if you have a smartphone, this will be the easiest and most convenient device to use. Download the Poll Everywhere app and use the app each day:
a. iOS: https://itunes.apple.com/us/app/poll-everywhere/id893375312

If you are not able to use a smartphone to respond, you may use another internet-enabled device such as a tablet or a laptop instead. For these, the URL is: https://www.polleverywhere.com/biol12. You will need to log into the site at the beginning of class each day.

Class will meet 28 times, not counting the first class, exams, and the optional review sessions. You can miss 10% (three classes) of the classes without losing any class participation points. Therefore, if you come to class every day, you earn 50 class participation points. If you come to 25 of 28 classes, you earn 50 points. If you attend 21 classes, you will receive 42 pts; if you attend 15 classes, you will receive 30 pts, etc.

Writing Assignments:

There will be two, very short (one page each) writing assignments this term. The first will be two paragraphs long, and the second will be one page long (but no more). You will prepare a draft of each assignment by the first due date, it will be peer reviewed anonymously by two of your fellow students by a second due date, you will revise your assignment as necessary and submit it by the final due date. All of this (submission, peer review, resubmission) will occur on line at a site called MyReviewers.org. More details about these assignments will be provided in class in a few days.

Grading Policy for Exams:

The following points summarize the grading procedures with respect to exams:

[1] After an exam has been graded and returned, a copy of the answer key will be posted on Canvas. Review this answer key and be sure you understand the errors in your exam and why you made them. If you do not understand what you did wrong, you are very likely going to make the same mistake again on the next exam.

[2] The number of points given for each answer is final. If, after reviewing your answers and comparing them to the posted answer key, you find an arithmetic error or detect an omission by the grader for one of the questions, you must observe the following procedures to correct the error:

  a) Do not write on the exam. Exams that have been written on will not be corrected. Any alteration of the answers between the time when the graded exams were returned to students and the time when the exam was submitted for error correction constitutes a breach of the Academic Honor Principle and will not be tolerated. To deter this practice, we scan exams before grading them.

  b) Prepare a typed cover page with your name and HB number.

  c) If you find an addition error, indicate on the cover page that an addition error has occurred. Specify the page and question number(s), if applicable.

  d) If you determine that your answer contains all of the information indicated in the key, but you did not receive full credit, simply indicate the number of the question on your cover page and state in one or two short, descriptive typed sentences the facts that make your answer correct. The citation of a text page, diagram, or reference to a lecture date/number would also be helpful.

  e) Attach the typed cover sheet to your complete exam and return it to the Bio12 drop box outside Room 202 in LSC before the deadline noted below. The error correction process will
take a few days. You will be notified of the place and time to pick up your exam after the
correction is completed.

We will not accept questions regarding errors in grading after the deadlines noted below. Nor will we
accept requests that are not typed. Sorry for these rules, but if we do not impose them, things get a bit
out of hand, especially toward the end of the term.

These are the deadlines for having a grading error corrected:

First Exam: 12:00PM (Noon) 15 October
Second Exam: 12:00PM (Noon) 5 November

We will not accept questions regarding errors in grading after these deadlines. There will be no
such process for the final exam, as the final exam is, after all, final.

Academic Honor Principle:

The Dartmouth College Student Handbook states "Fundamental to the principle of independent
learning are the requirements of honesty and integrity in the performance of academic assignments, both
in the classroom and outside. Dartmouth operates on the principle of academic honor, without proctoring
of examinations. Students who submit work which is not their own or who commit other acts of academic
dishonesty forfeit the opportunity to continue at Dartmouth."

There are a number of situations in which a student in Biology 12 might be tempted to violate the
Academic Honor Principle. These situations include (but are not limited to) the following:

a) Examinations must be completed without reference to written materials other than those provided with
the exam pages and must be completed without communication with anyone else (the only permissible
exception is that students may request clarification of any exam question from Prof. S., which is why he
makes himself available during the exams). The answers that you provide must be entirely your own
work. This means you talk to no one, you do not prepare notes that you leave on the floor at your seat,
you do not write notes on the palm of your hand (or elsewhere on your body or clothing), you never leave
notes or texts in the rest room to consult during an exam, and you never, ever use any sort of electronic
device to obtain information during the course of an exam. And yes, all these things have occurred in
past offerings of Bio 12 (I have been here a while...).

b) Our policy permits the re-submission of exams for correction of errors made during the grading
process. Any alteration of the answers on an exam made between the time the graded exams were
returned to the student and the time when the exam was submitted for correction constitutes a clear,
premeditated, and egregious breach of the Academic Honor Principle. To deter this practice, we
photocopy exams before grading them.

c) It goes without saying, but I have to say this again. When submitting a writing assignment it is a
violation of the Honor Principle to submit, in whole or in part, an assignment that was submitted by
another person during a past offering of Bio 12.

d) Laboratory experiments are performed in pairs or groups, and we strongly encourage student
collaboration. This includes data collection, analysis, and visual presentation of the data (graphs/tables).
However, the writing of the text of the lab reports and the preparation of the data obtained in the form of
figures, tables, etc. submitted for grading must represent the original work of the student submitting that
report. While we encourage collaborative discussion of your data, all writing must be done independently
and individually. Do not share computer files of work (including graphs and tables) to be submitted for
grading! Although you are encouraged to discuss lab data with your lab partner(s) and with other
students in the class, you must prepare the text and graphical content of each lab report you submit for
grading yourself. A student misrepresenting the work of another as his or her own would be in violation of the Academic Honor Principle, as is likely the student who provided that information. Thus, it is possible that the Committee on Standards will find the student providing the original file also to be in violation of the Honor Principle.

Honesty is the foundation of the academic pursuit of knowledge. In recognition of this, the staff of Bio 12 will not overlook any violations of the Academic Honor Principle. Indeed, the Faculty Handbook of Dartmouth College states explicitly that College faculty members are obligated to report potential violations of the Academic Honor Principle to the Committee on Standards.

Note to Students with Physical or Learning Disabilities:

I encourage students with disabilities, including invisible disabilities such as chronic illnesses and learning disabilities, to arrange for accommodations that might be helpful. Please meet with me soon, preferably during the first week of class, to discuss possible accommodations that have been approved by the folks at Student Accessibility Services. All discussions will be confidential, although the Academic Skills Center may be consulted to discuss the details of the accommodation recommended.

Religious Observances:

Some students may wish to take part in religious observances that occur during this academic term. If you have a religious observance that conflicts with your participation in this course, please speak with me as soon as possible to discuss appropriate accommodations.

How to be Successful in Bio 12 (see more at the study strategies link on the Canvas home page):

1) Preview the topic to be discussed the night before class. If using the textbook, look at the figures, read the figure legends, and get a general feel for the vocabulary to be introduced and the topics to be covered in the upcoming class. If not, review the data to be discussed (slides on Canvas). In either case, jot down any questions you have to focus your attention in lecture.

2) Attend lectures on time (class will start promptly at 8:50 AM), take notes on the material discussed in class, and ask questions about the things you do not understand. Make sure you have answers to the questions you wrote down the previous night.

3) That very same afternoon or evening, familiarize yourself with the topics discussed and review your notes, while things are still fresh in your mind. Correct or add points to your notes as you go along. And please note the following. The study of how effective learners learn things indicates that certain activities promote learning and retention much better than simply re-reading your notes and/or the textbook and convincing yourself that the material is familiar to you. And note that on an exam, I am not going to show you your notes and ask you if they look familiar…

If you would like to learn more about the most effective strategies for studying and learning (and the research underlying these recommendations), have a look at the book entitled *Making it Stick: The Science of Successful Learning* by Brown, Roediger III, and McDaniel. One effective study strategy is called retrieval practice. The actual act of retrieving information (like working on practice exam questions, responding to a clicker question, or to a verbal question posed in class or at a study group or a review session, etc.) helps you to solidify your knowledge/memory and enhances your ability to retrieve that information in the future. Thus, I encourage you to build the study habit of retrieval practice into your own personal study routine.

4) Review the notes and reading assignments from the previous week’s classes sometime during the weekend.
5) Be curious and ask questions in class, in office hours, in lab, and with fellow students, etc. Also ask yourself questions and challenge yourself to understand the material.

6) Test your own knowledge by putting away your notes and drawing out structures and pathways from memory. Your goal is to be able to accurately re-create the details and mechanisms we discuss in class, and understand them. Do not just try to do this as a mental exercise (i.e. in your head). Do it on paper, as you would be doing it in an exam, and then compare your attempt with your notes and the textbook.

7) Attend all classes and review sessions and come to office hours, even if you have nothing to ask.
Laboratory Section Information:

Below is a calendar outlining each laboratory session for the term and relevant assignment due dates. This calendar will also be available electronically through the Lab Section Canvas site and can be integrated with your other courses for the term. Be sure to check the Canvas regularly throughout the term for any changes to this calendar.

<table>
<thead>
<tr>
<th>Lab</th>
<th>Date</th>
<th>Assignment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lab 1 – Microscopy</td>
<td>September 18-20</td>
<td>Laboratory Quiz In-lab microscopy assignment</td>
</tr>
<tr>
<td>Lab 2 – Ion Chromatography</td>
<td>September 25-27</td>
<td>Laboratory Quiz Ion Chromatography Summary Assignment</td>
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<tr>
<td></td>
<td>No Lab October 2-4</td>
<td></td>
</tr>
<tr>
<td>Lab 3 – Gel Electrophoresis</td>
<td>October 9-11</td>
<td>Laboratory Quiz Protein Gel Summary Assignment</td>
</tr>
<tr>
<td>Lab 4 – Hill Reaction</td>
<td>October 16-18</td>
<td>Laboratory Quiz Lab Report</td>
</tr>
<tr>
<td></td>
<td>No Lab October 23-25</td>
<td></td>
</tr>
<tr>
<td>Lab 5 – Cell Motility</td>
<td>October 30-November 1</td>
<td>Laboratory Quiz Lab Abstract</td>
</tr>
<tr>
<td>Lab 6 – Experimental Design</td>
<td>November 6-8</td>
<td>Methods Assignment Lab Report</td>
</tr>
</tbody>
</table>

How to determine your laboratory section:

On the first day of class you will be directed to fill out an online survey to determine your lab section based on your academic schedule. Conflicts of an academic nature will take priority, followed by work and extracurricular activities.

It should go without saying, but we need to say it anyway. You must represent to us your schedule accurately and truthfully, otherwise you are in violation of the Honor Principle. Your lab section assignment will be the same for the entire term and it is your responsibility to ensure that you will be in attendance for all sessions. Be sure to check all exams and X-hours for your other classes throughout the term. This term there will be five lab sections; the students in these sections will be derived from both sections of Bio 12:

Section 1: Tuesday 2:15-6:15pm  
Section 2: Tuesday 6:30-10:30pm  
Section 3: Wednesday 2:15-6:15pm  
Section 4: Wednesday 6:30-10:30pm  
Section 5: Thursday 6:30-10:30pm

You must submit information relative to your lab assignment by Friday, 14 September. You can find the link where you do this here:  https://dartmouth.instructure.com/courses/29946/quizzes/23408