

## **CANCER BIOLOGY: GETTING STARTED 2017-2018**

Important URL links:

### **Cancer Biology Program**

<http://med.stanford.edu/cancerbiology.html>

### **SUNet ID**

<http://accounts.stanford.edu>

### **Encryption**

Encryption of computers and other devices is required:

<https://med.stanford.edu/datasecurity/>

### **AXESS**

Electronic records

<http://axess.stanford.edu>

### **Registrar's office**

Catalog of courses, policies, degree requirements, etc.

<https://registrar.stanford.edu/>

### **Honor Code and Fundamental Standards**

Read about academic integrity, plagiarism, the standard of conduct for students at Stanford, etc.:

<https://gradadmissions.stanford.edu/admitted-students/entering-stanford/honor-code-and-fundamental-standard>

## FIRST YEAR

### General resources:

<http://med.stanford.edu/cancerbiology/StudentResources.html>

**CCRTP Boot Camp:** Students must participate in this 4-day orientation to clinical and basic biology at the beginning of the first year.

<http://med.stanford.edu/cancer/training/ccrtp.html>

**Annual Retreat:** Students must attend the annual Cancer Biology Program conference, which provides an introduction to the research ongoing in laboratories in the program and an opportunity for networking with students and faculty in the program.

<https://med.stanford.edu/cancerbiology/events/AnnualScientificConference.html>

**First-Year Mentors:** Each first-year student will be assigned a first-year faculty mentor with whom he/she should meet to discuss rotation choices, classes, and any other areas of concern. Meeting at the beginning of the fall quarter and the end of the spring quarter before choosing a thesis laboratory are the minimum requirements.

**Fellowships:** Students are encouraged to apply for the National Science Foundation (NSF) and National Defense Science and Engineering Graduate (NSDEG) fellowships; discussions with their mentors and program directors will help decide if these applications should be submitted the first year. First-year mentors should provide feedback on the proposals. A special fellowship-writing program is held by senior Cancer Biology graduate students in the fall of the first year to help with preparation of the applications.

**Laboratory Rotations:** Students typically do 3 rotations in laboratories during the first year, to identify a laboratory of interest for their thesis work. Students need approval from the program before starting a rotation. Requests for only 2 rotations must be approved by the Directors. Rotations typically last one quarter, but it is possible to do two shorter rotations each lasting half a quarter, with permission from the Directors. At least 2 of the rotations must be done in laboratories of faculty affiliated with the program. Participating faculty:

<http://med.stanford.edu/cancerbiology/ParticipatingFaculty.html>

Rotations in the summer before the first year are possible:

<https://biosciences.stanford.edu/current/diversity/advance/>

Numerous faculty members present their research programs at the annual retreat and fall journal club to help first-year students select potential rotations. First-year mentors can also provide advice. Students are encouraged to meet with numerous potential rotation mentors, to help choose. A discussion session with second year students is also held at the beginning of the first quarter, and a database of past rotations is accessible to students:

<https://stanford.edu/~liirene/cbio-rotations/script.html>

No more than 2 students from the Cancer Biology program can rotate in the same lab at the same time.

An evaluation form must be completed by the student and the faculty member at the end of each rotation:

[http://med.stanford.edu/cancerbiology/StudentResources/\\_jcr\\_content/main/panel\\_builder\\_1/panel\\_0/download/file.res/LabRotationEvaluation.pdf](http://med.stanford.edu/cancerbiology/StudentResources/_jcr_content/main/panel_builder_1/panel_0/download/file.res/LabRotationEvaluation.pdf)

**Joining a laboratory:** At the end of the rotations, students will select a laboratory for thesis work, after discussion with their first-year mentors. The first-year mentor must sign a form to document this conversation. The choice of the lab must also be communicated to the program administrator and approved by the Directors. If the student decides to do his/her PhD as a joint student between two laboratories, there must be one primary faculty PhD advisor

Year 1 - thesis lab form choice: <http://med.stanford.edu/cancerbiology/StudentResources.html>

No more than 2 students from the Cancer Biology program can join the same lab the same year. At any given time, one lab cannot have more than 5 Cancer Biology students

**IDP:** Students must fill out Individual Development Plan forms with their thesis advisors within 30 days of joining the lab, typically during the summer quarter.

<https://biosciences.stanford.edu/current/idp/>

**Required Coursework:** A minimum of 135 units is required for receipt of the Ph.D. from Stanford\*. Students must register for 10 units every quarter<sup>&†</sup>.

<http://med.stanford.edu/cancerbiology/HOME/Curriculum.html>

<b>Fall<sup>#</sup></b>	Foundations	(5 units – BIOS 200)
	Molecular and Genetic Basis of Cancer	(4 units – CBIO 240 <sup>‡</sup> )
	Journal Club - Faculty presentations	(1 unit – CBIO 280)
	Seminar/pizza talk series <sup>#</sup>	(1 unit – CBIO 245)
<b>Winter</b>	Journal Club	(1 unit – CBIO 280)
	Seminar/pizza talk series	(1 unit – CBIO 245)
<b>Spring</b>	Cellular and Clinical Aspects of Cancer	(4 units – CBIO 242 <sup>‡</sup> )
	Journal Club	(1 unit – CBIO 280)
	Seminar/pizza talk series	(1 unit – CBIO 245)

Winter or Spring: MED 255 is the required Responsible Conduct in Research course (1 unit), and it is offered every quarter but it fills up very fast. Wake up early to be able to sign at up 8 AM!

\* Transfer students may receive credit for up to 45 units of appropriate graduate study elsewhere, and at least 90 units must be completed at Stanford toward the Ph.D.

<sup>&</sup> Register for Graduate Research (CBIO 399) as needed to maintain enrollment in 10 units each quarter, including summer, until you reach TGR status (135 units), and then register for CBIO 802 (zero units).

<sup>†</sup> For all courses, use L. Attardi or J. Sage as your advisor until you find a rotation lab.

<sup>#</sup> To avoid going over 10 units in the fall quarter, do not sign up for CBIO 245 or CBIO280; note that these two classes are still required for 1<sup>st</sup> (and 2<sup>nd</sup>)-year students, and attendance will be monitored.

<sup>‡</sup> CBIO 240 and CBIO 242 are the only two courses taken for letter grades.

Also note that attendance is always taken for CBIO 245 and CBIO 280, and only 1, exceptionally 2, missed classes per quarter will be allowed (for each quarter in which more than 2 classes are missed, then the student will have to take an additional quarter after their 2<sup>nd</sup> year).

**Elective Coursework:** A minimum of 10 units is required (total). A variety of courses are available as electives, according to the individual student's interests. If desired, different specialization tracks listed on the Cancer Biology Program website can be selected (e.g. Computational biology, Immunology etc.). In the first year, winter and spring quarters are ideal times to pursue elective coursework. A list of courses can be found here:

<http://med.stanford.edu/cancerbiology/HOME/Curriculum.html>

<https://explorecourses.stanford.edu>

## SECOND YEAR

**Annual Retreat:** Students must attend the annual Cancer Biology Program conference every year and they must present their work every year in the form of a poster or a talk. In most cases, second-year students will present a poster. Note that each student in the program is required to give at least one talk at the retreat during graduate school, and two talks are recommended.

**Qualifying Exam:** Each student must write a proposal based on his/her thesis work and defend it in front of a committee of 3 faculty members, in order to advance to candidacy. The qualifying exam must be done by the end of the winter quarter. Each student is responsible for scheduling his/her own examination to conform to the above deadline. If the deadline is missed, the Program will consider that the student failed the exam. At least 2 committee members must be from the Cancer Biology program; the committee must be approved by the Program Directors before it is finalized.

The exam itself consists of an NIH-style written grant proposal and an oral examination. The proposal is to be handed out to committee members no later than 10 days prior to the examination. The format of the proposal is 7 pages, including figures but excluding references, with 1.0 line spacing, Arial 11, and 0.5-inch margins. The first page is a Specific Aims page, and other sections include Background-Significance and Research Plan (including the discussion of alternative approaches). For the oral examination, the goals are for the student to demonstrate:

1. A broad knowledge and understanding of the field
2. A historical perspective, and identification of seminal contributions to the field
3. Knowledge of experimental procedures
4. Critical judgment in the evaluation of data and results
5. An ability to draw conclusions from proposed experiments and to propose alternatives

This is an “on-topic” exam where the student is expected to defend the work that he/she proposes for a thesis project. Just prior to beginning of the oral exam, the student’s advisor is expected to meet with the examination committee for a brief closed-door session without the student present. A copy of the student’s Stanford University transcript and laboratory rotation evaluations will be made available to the examination committee as well. The student’s advisor will not be present during the remainder of the examination. Once the advisor leaves the room, the qualifying examination committee will designate a Chair, who will be formally in charge of the proceedings and will decide when the exam is over. The student will then be invited into the room to begin his/her presentation. Generally, students prepare a 30-minute oral presentation that reviews the background, but largely focuses on the Specific Aims and the proposed experiments. When the Chair determines that the examination is completed (generally after about 60-90 minutes), the student is asked to leave the room and the committee deliberates in private about the student’s performance. A student’s performance will be deemed satisfactory or unsatisfactory by a simple majority vote of the qualifying examination committee. The student will be assessed on his/her written proposal, oral presentation, and mastery of the specific field of research including background literature and experimental techniques, and general knowledge about the broader field of cancer biology. The decision of the examination committee is conveyed orally to the student immediately following the exam. In addition, the Chair is responsible for summarizing the strengths and weaknesses of the written proposal and oral presentation on the examination form. The original examination form must be given to the Program Administrator.

If the qualifying examination committee deems the student’s performance unsatisfactory, the committee can request a revision or retake of the written proposal, the oral examination, or both, prior to the end of spring quarter, second year. If the student fails the second examination, he/she will be dismissed from the program.

Year 2 – Pass qualifying exam form: <http://med.stanford.edu/cancerbiology/StudentResources.html>

**Advancing to candidacy:** After a student has completed non-research Cancer Biology Program requirements, he/she qualifies for doctoral candidacy. Most students file for doctoral candidacy in the Summer Quarter of their second year.

Year 2 – Advance to candidacy form: <http://med.stanford.edu/cancerbiology/StudentResources.html>

**Fellowships:** Second-year students can still apply for fellowships, including the National Science Foundation (NSF) and National Defense Science and Engineering Graduate (NSDEG) fellowships. A special fellowship-writing program is held by more senior graduate students in the fall of the first year to help with preparation of the applications.

**Required Coursework:**

<b>Fall</b>	Journal Club - Faculty presentations	(1 units – CBIO 280)
	Seminar/pizza talk series	(1 units – CBIO 245)
<b>Winter</b>	Journal Club	(1 units – CBIO 280)
	Seminar/pizza talk series	(1 units – CBIO 245)
<b>Spring</b>	Journal Club	(1 units – CBIO 280)
	Seminar/pizza talk series	(1 units – CBIO 245)

Note that attendance is always taken for CBIO 245 and CBIO 280, and only 1, exceptionally 2, missed classes per quarter will be allowed (for each quarter in which more than 2 classes are missed, then the student will have to take an additional quarter after their 2<sup>nd</sup> year).

**Elective Coursework:** Students should continue to fulfill any elective requirements needed. A minimum of 10 units is required (total).

**Individual Development Plan (IDP):** Students must fill out IDP forms to make a plan for the next year's goals and schedule a time to discuss the form with their advisors.  
<https://biosciences.stanford.edu/current/idp/>

**Thesis Research:** Students will conduct research in their PhD labs.

**Thesis Committee:** Choosing a qualifying exam committee provides a good opportunity to select faculty members who will be able to provide key input into the project and may become members of a permanent thesis committee, although the student and his/her mentor can decide to choose different committee members for the thesis committee. We advise to not bring the thesis committee form to the qualifying exam so the student has more time to choose a thesis committee subsequently.

Students will select thesis committees of 3 individuals that they feel will best help them during the course of their thesis work. At least 2 committee members must be from the Cancer Biology program; the committee must be approved by the Program Directors before it is finalized. This can be the same set of faculty members present at the qualifying exam, or substitutions can be made. The thesis committee is best selected with the help of the student's thesis advisor.

## THIRD/FOURTH YEAR

**Grant Writing Academy and Senior Fellowships:** Many students will apply for a fellowship in the 3<sup>rd</sup> year, including NRSA (NIH). Stanford has a grant-writing academy to help:

<https://biosciences.stanford.edu/current/grants-fellowships/>

**Annual Retreat:** Students must attend the annual Cancer Biology Program conference every year and they must present their work every year in the form of a poster or a talk. Note that each student in the program is required to give at least one talk at the retreat during graduate school, and two talks are recommended. The 3<sup>th</sup> and 4<sup>th</sup> years are usually good times to give a talk.

**Pizza Talk Presentation:** Students must give at least one long-format pizza talk to gain experience in delivering a longer-format talk.

**Elective Coursework:** Coursework should be finished by the end of the Winter quarter in the 4<sup>th</sup> year. At this point, students should have a total of 135 units and will have achieved “TGR” status (Terminal Graduate Registration). Students may still take courses up to 3 units per quarter.

**Teaching:** Students may opt to do TAships, for teaching experience. They will need to secure approval from their PhD advisors before committing to a TAship.

Year 3/4 – Teaching Assistant form: <http://med.stanford.edu/cancerbiology/StudentResources.html>

**Individual Development Plan (IDP):** Students must fill out an IDP form to make a plan for the next year’s goals and schedule a time to discuss the form with their advisors.

**Thesis Research:** Students will perform thesis research.

**Thesis Committee Meeting:** In the 3<sup>rd</sup> year, students will still meet annually with their thesis committees to provide an update on research progress and to solicit feedback toward the goals of publications and thesis defense. Beginning in the 4<sup>th</sup> year, students must meet twice a year with their thesis committees.

## **FIFTH YEAR**

Some students may graduate in the 3<sup>rd</sup> or 4<sup>th</sup> year, as long as they have completed all the program requirements, but students should aim to wrap up in their 5<sup>th</sup> year.

**Responsible conduct of research:** Students must re-train every 4 years, so students who have not graduated yet must take MED 255 again or BIOS 258.

**Annual Retreat:** Students must continue to attend the required annual Cancer Biology Program conference and present their research. If a student has not given a talk in the years before, this is a requirement for graduation and it has to be done in the 5<sup>th</sup> year.

**Pizza Talk Presentation:** Students must give one long-format pizza talk to gain experience in delivering a longer-format talk. This is a requirement for graduation, so if it has not been done before the students have to do it in the 5<sup>th</sup> year.

**Individual Development Plan (IDP):** Students must fill out an IDP form to make a plan for the next year's goals and schedule a time to discuss the form with their advisors.

**Thesis Research:** Students will perform thesis research.

**Biannual Thesis Committee Meetings:** Students must meet twice a year with their thesis committees.

## **OVERALL REQUIREMENTS FOR GRADUATION**

**135 Credits for coursework, including required courses and electives of choice**

**Advancing to candidacy**

**One retreat talk (and posters the other years, starting in the 2<sup>nd</sup> year)**

**One Pizza Talk**

**One first-author paper submitted to a peer-reviewed journal**

**Written dissertation and oral defense**