# Cancer Biology and Biotechnology (BIOS 4015 & BIOL 7015) Fall, 2018: Final syllabus

**Course description:** The purpose of this course is to introduce the major concepts of cancer biology and state-of-the-art technologies. Although a recently published textbook introduces many of these topics, a major goal of the course is to enable students from any discipline at Georgia Tech to be adept in learning about cancer from primary literature and how to apply their skills to cancer research.

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with invited lecturers from Georgia Tech, Emory and elsewhere.

Teaching assistant: Yuehui Zhao (2018BIOL4015TA@gmail.com)

**Time and location:** Tuesdays and Thursdays, 3:00 pm - 4:15 pm; CULC 152

**Prerequisites**:BIOS 1107 AND (BIOS 1107L OR BIOS 1207L) OR BIOL 1510 OR BIOL 1511 or CHEM 1310

**Textbook and other required materials: The textbook for the course is *Molecular Biology of Cancer: Mechanisms, Targets, and Therapeutics, 4th Edition* by Lauren Pecorino** (Oxford University Press, 2016). An eBook version is available from the bookstore or the website <https://www.redshelf.com/> at a relatively modest rental price (~$40 for 180 day digital rental). The printed, paperback version can also be used, and the price appears to be about twice the rental (but you have a copy forever). The instructors have requested that the Georgia Tech library maintain a copy of this book on reserve.

**You will also need access to Learning Catalytics** (<https://www.pearsonhighered.com/products-and-services/course-content-and-digital-resources/learning-applications/learning-catalytics.html>) (the price for 6 months is $12; if you already have an account for another course, you do not need to have a separate account for this class). Learning Catalytics will be used for pre-class assessments as well as for some of the in-class discussions. Much of the textbook-level information will be taught in a “flipped” format and students will utilize the Pecorino textbook and Learning Catalytics. It is estimated that 1-2 hours will be required outside of class to prepare for EACH lecture, although some students might need to commit more time.

**Some of the in-class discussions will involve analysis of assigned research articles, so you will need to have access to online journal articles**. All of the articles that will be used in class will be from journals available via the Georgia Tech library and, in most cases, accessed using the web address:

<https://gatech-primo.hosted.exlibrisgroup.com/primo-explore/citationlinker?vid=01GALI_GIT&lang=en_US>

All GT students can log on for access to these materials. When you need to find research articles on your own, useful search tools are:

**Pub Med**: <http://www.ncbi.nlm.nih.gov/pubmed/>

**My NCBI:** to sign up for an account

<https://www.ncbi.nlm.nih.gov/account/?back_url=https%3A%2F%2Fwww.ncbi.nlm.nih.gov%2Fmyncbi%2F>

**Google Scholar**: <https://scholar.google.com/>

**Many of the supplemental materials for the course will be posted on the T-Square web site for this course, and course announcements will be made by e-mails to the class from that site:** The T-Square site for this course will have subfolders for the in-class activities, the team projects, exams, etc.

**Other useful sources of information**: The online video “Cancer: The Emperor of All Maladies” <http://www.pbs.org/show/story-cancer-emperor-all-maladies/> (if you have difficulty with that link, try: <http://www.pbslearningmedia.org/resource/8e81e1ad-e720-4550-b350-11ea5656d7b5/what-is-cancer-lesson-plan/> ) is a good overview that is presented at a layperson’s level of understanding of cancer and the issues it involves.

It might help you to look at the cancer research summaries that are posted on the web site for the Integrated Cancer Research Center (<http://www.icrc.gatech.edu>).

**Course format:** The availability of a reasonably priced textbook enables this subject to be taught via a largely “flipped” manner, with coverage of many of the concepts by the textbook and emphasis/expansion of some of the topics by in-class discussions, presentations by invited researchers, and other resources, plus team-based projects that culminate in an open “Festival of Research Ideas in Cancer Biology and Technology.” Thus, *the basic concepts will be covered by assigned readings in Molecular Biology of Cancer…* with pre-class and in-class exercises using Learning Catalytics to ensure the information is understood. *Discussion of selected topics by invited speakers and sometimes assigned research papers for discussion in class* will complement and build upon the information from the textbook. Ample time will be allocated for students to discuss the ideas raised by these presentations, and you are encouraged to think about questions such as: What is the underlying principle of cancer biology that is being addressed? What challenge is the new technology trying to solve? How does the new technology work? How might it be improved? Etc. *For the Festival, students will work in teams* to select a research paper that addresses an important facet of cancer and involves an interesting, and often novel, technology. The team will become expert in the subject by exploring the published research literature and then prepare an oral presentation that will explain it to the class and a poster that will be shown in the “Festival of Research Ideas in Cancer Biology and Technology” that is open to the entire campus. The poster will also include a concrete plan developed by the team for studies that would follow-up on those described in the paper.

**Grading:** Exams (2) covering textbook & in-class activities 40%;

Final exam (covering poster projects and related information) 20%

Pre-class preparation (5%) and in-class participation (5%) 10%

Team research project (Festival presentation, final poster, individual summary) 30%

Final grading scale: 90% and greater (A); 80-89% (B); 70-79% (C); 60-69% (D); Less than 60% (F)

**Additional information about exams and other course activities:**

**Exams (60% of final grade)**

>Two exams (20% of final grade each) will cover the information in the chapters stated on the syllabus and special topic discussions through and including the last class before the exam.

>The final exam (20% of final grade) will be on the information related to the team posters, but students should be prepared to handle basic questions about how the information is related to concepts presented elsewhere in the course. For example, if one of the posters concerns a new inhibitor of metastasis, you should be able to relate the information in the poster to a basic understanding of metastasis.

**Pre-class preparation and in-class participation (10% of final grade)**

**Pre-class preparation (5% of final grade):** Students will record their completion of the assigned reading by answering questions posted on Learning Catalytics. To receive credit: a) you need to complete the exercise no later than 30 min before the beginning of the class; and b) you need to answer half of the questions correctly (you are not being tested on the material at this point, this assesses how students are keeping up with the reading). You get full credit (5 points) if you do 75% of the exercises; 4 points for 60%; 3 points for 40%, etc.

**In-class participation (5% of final grade):** The discussion of research papers in class, the special topics presentations, and question-and-answer time after in-class presentations by student teams are intended to stimulate thoughtful and creative contemplation of cancer and how technology can be applied to cancer. To record your involvement, an “in-class participation” grade will be earned by filling in an “I participated” form that records each time that you have asked a thoughtful question or made a comment in class related to the material. You should download the form so you can fill it in when you have done this (it needs to be turned in to the TA during the same class). Each form that you turn in will be worth 1% (i.e., if you turn in 5 during the semester, you will qualify for full credit). It is recognized that for a large class like this one (~100 students), it might not be possible for everyone to participate as often as they want; therefore, if you have difficulty participating orally, you may still fill in the “I participated” form, but also answer the section that asks what the answer was to the question you wanted to ask—i.e., you will need to look up an answer to the question and cite the source of the information (a primary source, not merely a web site or wikipedia), and turn the form in to the TA at the next class. For a few of the invited speakers, we will distribute “I participated” forms in class so you receive credit for being present. These are intended to reward attendance and will not be announced before class.

**NOTE Graduate students taking BIOL7015:**  For one of the questions/comments you raise in class, look up two research papers on the topic and write a brief statement (several sentences will suffice) about what the paper contains that relates to your question/comment. If you have already done this in formulating the point you raised in class (for example, perhaps you have done a Pub Med search on your laptop as you formulated the question, or soon afterwards), then you can write the references on the form before you give it to the TA that evening. Otherwise, send it to the TA via e-mail before the next class. If you do not fulfill this extra requirement, your in-class participation grade will be reduced half (i.e., if you have a score of 5, you would only receive 2.5 points for it); therefore, be certain to do this before the end of the semester.

**Team research paper analysis and presentation at the Festival of Research Ideas in Cancer Biology and Technology (30% of final grade)**

The goal of this portion of the course is to give you a chance to work on a challenging problem in the area of cancer biology and technology.

**First week of class**: Students will divide into teams of approximately 5-6 members per team, and over the next two weeks you will pick a research paper that addresses some facet of cancer that involves technology. These must be relatively recent (i.e., within the last year or two), peer-reviewed, primary research papers (not reviews) that address an important problem in cancer detection, treatment, follow-up monitoring or other clinical need through development of, or novel application of, new technology. At the end of the syllabus is a list of some of the titles of papers used in this course previously. These are given as examples only—each team should find their own paper. If you have difficulty selecting a paper, consult the instructors as soon as possible.

**By Sept. 5**: Each team will notify the instructors of their proposed paper by filling in the “CBT team & topic” form (download template from T-Square) and sending it to the TA no later than Sept. 5. The instructors will notify you if the selection has been approved (or you need to find a more appropriate paper--this happens in about half of the cases) and when approved will notify you of the date that your team will present an in-class “flash-talk” (described below).

For the next several weeks, you will analyze the paper to understand everything about it as well as think about how its technology can be improved or extended. You are responsible for exploring the published research literature to broaden your understanding of the rational and need for the technology you have selected. We encourage you to discuss your ideas with the instructors and any other persons at Tech, Emory or other institutions who might be of assistance.

**Flash-talks (Sept. 25-Oct. 4)**: The flash talk will give a brief outline of the paper/project selected and some ideas about how the group plans to extent the work. A flash talk is a Powerpoint presentation with just the essentials summarized in 5 to 6 slides in 5 minutes followed by 5 to 10 minutes of discussion with the instructors and class about how it might be improved. Thus, the likely content of the slides in the flash talk would be (with one slide each): What is the cancer need (examples: to detect a particular type of cancer sooner; to treat a type of cancer more completely; to reduce side effects of a cancer treatment; others)? How does the new approach described in this paper propose to meet the need? What is the key evidence that it works? What do the authors (and/or you) suggest should be done next?

The date for your flash talk will be assigned by the instructors when your paper is approved. E-mail your flash talk to TA before noon on the day of your presentation so it can be uploaded before class and avoid wasting time getting it set up in class.

You will not be graded on the flash talks—it’s purpose (and the critique of the ideas in class) is to assist you in developing an excellent project and poster for the Festival.

**As soon as your team has presented their Flash talk and gotten advice from the instructors, begin to plan and prepare your poster for the Festival.** The poster template and examples from previous semesters will be posted on T-Square. **When you have a draft that you are comfortable with, schedule a meeting of your team with one of the instructors to show her/him the poster and get suggestions for improvement (do this as early as possible**—otherwise there might not be time to make any necessary revisions before the Nov. 5 deadline for the first drafts of your posters to be exchanged in class).

**By November 5**: Send a copy of the *first draft* of the poster for the Festival of Research Ideas in Cancer Biology and Technology to the TA. For the class on Nov. 6, bring 10 copies of your poster (each printed on a single 8 1/2 by 11 inch page) to class so they can be exchanged with students in the class for discussion. This exercise will identify additional revisions that are needed in the poster. After class (and over the next week), revise the poster and send it to the instructors as soon as possible during the week of November 7-9 (see below) so the instructors can review it and, if ready (many will require further revisions), approve it for printing.

**Between Nov. 7 and 9**: Send the *final version* of your poster to the TA and instructors for review before you are authorized to print the poster. Your draft will be reviewed by the instructors in the order that they are received, so send your “final” poster as soon as possible. This schedule should allow time for you to get our approval, or make any remaining changes deemed necessary, and print them before class on Nov. 13. When your final poster is approved, you will be given a “pre-paid” invoice to print the poster in the library Multimedia Studio.

**November 13:** Bring your poster to class so you can practice presenting it to others in the class.

**November 15**: Presentation of the poster at the Festival of Research Ideas in Cancer Biology and Technology. This will be held in the atrium of the Petit Institute of Bioengineering and Biosciences from 3 to 5 PM on Thursday, November 15. Someone (or more) from each team should arrive by 2:30 pm to set up the poster and someone should stay a little later than 5 pm to help take it down.

The Festival will be publicized to the cancer research community (some of whom will also be invited to present posters) as well as some classes that are related to the Festival’s content (e.g., the molecular cell biology class, Dr. McDonald’s graduate cancer class, and others), so there are usually ~100 attendees beyond the number in our class. Thus, your posters will be viewed not only by your student colleagues but also by professional cancer researchers (and likewise, you will see posters from some of their work). Any useful suggestions/comments that you receive should be used to revise your poster and its suggestions for improvement/application of the technology before you submit an electronic copy of the revised poster to the TA. The final version should be sent both as a Powerpoint slide and as a pdf file.

Note that although you are poster presenters—you are also poster viewers, so divide your time between being at your poster to discuss it with others and moving around to see the other posters. You will be responsible for knowing the information on the posters for the final exam, so you will find that preparation for the final exam will be easier if you visit them during the Festival (but don’t panic if you don’t see all of them because they will be posted on T-Square for you to view in preparation for the exam).

**November 30**: You will probably get ideas about how the poster can be improved based on feedback at the Festival. Therefore, make those revisions after the Festival, then submit the revised poster (electronically) to the TA so we can post them on T-Square for everyone to have access to the information to prepare for the final exam.

**December 4:** EACH individual member of the team is also responsible for sending a one-to-two page summary of the technology and its improvement/application (in his/her own words—this must be written by YOU and not cut-and-paste from the team’s report). More details about what must be included in this summary will be posted on T-Square. The purpose of this separate summary is to ensure that all team members work closely enough with the project that they can clearly describe its content, and it is also an opportunity for each team member to explain their role in preparing the final poster and any particular ideas that they might want to express that didn’t appear in the final version.

**Grading for this portion of the course:** All members of a project group will receive the same grade for the poster (worth 20% of your final grade; 15% for the poster itself, 5% for being an active participant in the presentation of the poster at the Festival); **each individual will get a separate grade (worth 10% total) for the independent one-page summary of the project and a description of your roles in preparing the poster and presenting it at the Festival.**

**NOTE: If a group member feels they do not fit in the original group they joined, or the group thinks a member is not fulfilling their share of the responsibilities for the team project, contact the instructors as soon as possible so a solution can be found.**  Since all members of a project group will receive the same grade for the poster, and likewise, each member will need to declare what has been their role in preparing the poster and presenting it at the Festival, it is in the best interest of everyone to resolve any conflicts of this sort as soon as possible. In exceptional circumstances, it might be necessary for a student to prepare a project alone.

**Bonus opportunities:** Additional instructions will be posted on T-Square, but the opportunities to earn bonus points include: a) up to 3 bonus points for attending outside seminar(s) on some aspect of cancer research and/or cancer-related technology (this will be discussed in class and a standard form to use in notifying the TA of your attending the seminars will be posted); and b) 1 bonus point if >75% of the class submits the online course evaluation.

**Extensions, Late Assignments, & Re-Scheduled/Missed Exams:** The requirements for the per-class and in-class participation activities allow for some to be missed; therefore, it should be unnecessary to grant extensions unless a student misses class for an extended period, such as due to illness. Likewise, preparation of the materials for the Festival involve a long period of effort, so the deadlines will not be altered unless there are exceptional circumstances. If you will miss an exam or other activity due to an “approved Institute activities” (e.g. field trips and athletic events, see http://www.catalog.gatech.edu/rules/4/ for more information), notify the instructor well in advance of the activity because we will probably arrange for you to fulfill the requirement before the scheduled date rather than afterward. If you miss due to illness and it is not possible to prepare a make-up, another assessment mechanism will be used for that portion of the final grade.

**Cancer Biology and Biotechnology (Biol 4015 & 7015): Syllabus with tentative list of special topics**

Class time: 3:00 to 4:15 pm; Location: 152.CULC

*Date (class day) Topic(s) Instructor(s)*

|  |  |  |
| --- | --- | --- |
| Aug. 21 (T)  Aug. 23 (Th) | Introduction to cancer, course overview & excerpts from “Cancer: The Emperor of All Maladies”  Introduction to cancer, Pecorino, Chap. 1.  Research teams meet | Yuhong Fan, PhD (GT Biosci)  & Al Merrill, PhD (GT Biosci)  Al Merrill, PhD (GT Biosci) |
| Aug. 28 (Tu)  Aug. 30 (Th) | DNA structure and stability: mutations vs repair (Pecorino, Chap. 2)  Team science  Regulation of gene expression (Pecorino, Chap. 3) | Al Merrill, PhD (GT Biosci)  Mary Lynn Realff, PhD (GT MSE)  Yuhong Fan, PhD (GT Biosci) |
| Sept. 4 (Tu)  Sept. 6 (Th) | Growth factor signaling and oncogenes (Pecorino, Chap. 4)  Team science  The cell cycle (Pecorino, Chap. 5) | Al Merrill, PhD (GT Biosci)  Mary Lynn Realff, PhD (GT MSE)  Yuhong Fan, PhD (GT Biosci) |
| Sept. 5 | Teams send CBT team & topic form to TA |  |
| Sept. 11 (Tu)  Sept. 13 (Th) | Growth inhibition and tumor suppressor genes (Pecorino, Chap. 6)  Resolve any issues regarding selection of paper  Apoptosis (Pecorino, Chap. 7)  Flash talk demonstration | Al Merrill, PhD (GT Biosci)  Instructors  Yuhong Fan, PhD (GT Biosci)  Instructors |
| Sept. 18 (Tu)  Sept. 20 (Th) | Cancer stem cells and the regulation of self-renewal and differentiation pathways (Pecorino, Chap. 8)  **First exam** (Percorino chapters 1-6) | Yuhong Fan, PhD (GT Biosci)  Instructors |
| Sept. 25 (Tu)  Sept. 27 (Th) | Flash talks begin (Teams 1-5)  Flash talks continue (Teams 6-10) | Instructors  Instructors |
| Oct. 2 (Tu)  Oct. 4 (Th) | Flash talks continue (Teams 11-15)  Completion of flash talks (Teams 15-18, or more if necessary)  Metastasis (Pecorino, Chap. 9) (continued on Oct. 11, if necessary) | Instructors  Instructors  Yuhong Fan, PhD (GT Biosci) |
| Oct. 9 (Tu)  Oct. 11 (Th) | **Fall recess. No class**  Angiogenesis (Pecorino, Chap. 10) | Al Merrill, PhD (GT Biosci) |
| Oct. 16 (Tu)  Oct. 18 (Th) | Nutrition and hormone effects on the genome (Chap. 11)  Special topic: Diet can affect cancer!  Tumor immunology and immunotherapy (Pecorino, Chap. 12)  Special topic: Update on cancer immunotherapy | Al Merrill, PhD (GT Biosci)  Omer Kucuk, MD (Emory)  Al Merrill, PhD (GT Biosci)  Kenny Offermann, MD/PhD  (www.Salutramed.com) |
| Oct. 23 (Tu)  Oct. 25 (Th) | Infectious agents and inflammation (Percorino, Chap. 13)  Special topic: Engineering immunotherapy  Technology & drug & diagnostics development (Percorino, Chap.14)  Special topic: Promising developments in ovarian cancer | Al Merrill, PhD (GT Biosci)  Susan Thomas, PhD (GT ME)  Al Merrill, PhD (GT Biosci)  John McDonald, PhD (GT Biosci) |
| Oct. 30 (Tu)  Nov. 1 (Th) | **Second exam** (Percorino chapters 7-14)  Special topic: Personalized and image-guided cancer treatment | Instructors  Eva Lee, PhD (GT ISyE) |
| Nov. 7-9 | Send your final drafts of the posters to the TA (via e-mail) |  |
| Nov. 6 (Tu)  Nov. 8 (Th) | In class discussion of first draft posters  Special topic: Cancer nanotechnology | Instructors  Mostafa El-Sayed, PhD (GT Chem/Biochem) |
| Nov. 13 (Tu)  Nov. 15 (Th) | Final preparations for Festival (bring poster to class)  **Georgia Tech Festival of Research Ideas in Cancer Biology and Technology, IBB Atrium** (3 to 5 pm) (set-up at 2:30 pm) | Entire class  Entire class |
| Nov. 20  **Nov. 22** | Follow-up discussion of Festival  **No class Thanksgiving holiday** | Instructors |
| Nov. 27 (Tu)  Nov. 29 (Th) | Special topic: Developmental defects and pediatric cancer in the nervous system  Special topic: Targeted Epigenetic Inhibition | Yuan Zhu, PhD  (Children's National Medical Center)  Adegboyega Oyelere, PhD (GT Chem/Biochem) |
| Nov. 30 (Fri) | Revised posters due by e-mail to TA |  |
| Dec. 4 (Tu)  Last class | Course wrap-up: Discuss format of the final exam  Individual written reports due before, or in class | Instructors |
| Dec. 6 (Th) | **Final exam,** 2:40 PM ‐ 5:30 PM | Instructors |

**Student-Faculty Expectations**

At Georgia Tech we believe that it is important to continually strive for an atmosphere of mutual respect, acknowledgement, and responsibility between faculty members and the student body. See http://www.catalog.gatech.edu/rules/22/ for an articulation of some basic expectations – that you can have of me, and that we have of you. In the end, simple respect for knowledge, hard work, and cordial interactions will help build the environment we seek. Therefore, we encourage you to remain committed to the ideals of Georgia Tech, while in this class.

**Student Use of Mobile Devices in the Classroom**

This course will make frequent usage of laptop computers and mobile devices so they are not prohibited; however, they may not be used in a manner that would be distracting to other students in the class, such as to watch non-course related videos, facebook pages, etc.

**Academic Integrity**

Georgia Tech aims to cultivate a community based on trust, academic integrity, and honor. Students are expected to act according to the highest ethical standards. For information on Georgia Tech's Academic Honor Code, please visit http://www.catalog.gatech.edu/policies/honor-code/ or <http://www.catalog.gatech.edu/rules/18/>.

Any student suspected of cheating or plagiarizing on a quiz, exam, or assignment will be reported to the Office of Student Integrity, who will investigate the incident and identify the appropriate penalty for violations.

Some of the issues involved in academic integrity are:

1. Plagiarism is not allowed. Plagiarizing is defined by Webster’s as “to steal and pass off (the ideas or words of another) as one's own; use (another's production) without crediting the source.”

In simpler terms: When you use any phases, sentences, etc. verbatim from another source, they must be identified by quotation marks and citation of the source. In scientific writing, it is generally preferable to rephrase information from other sources and cite the source rather than use the same text, even when you offset the text with quotation marks. When you show diagrams, models and other materials that are not your own, the sources must also be identified.

These rules apply both to published information and information that you might receive from another student, website, previous class report, etc.

Plagiarizing will be dealt with according to the GT Academic Honor Code.

2. Students are encouraged to collaborate in some aspects of the preparation of oral and written critiques, such as the early stages where you are achieving an understanding of the assigned papers; however, the final critiques must be written by each student alone.

For team oral presentations, students may collaborate in all aspects of the work, indeed, it is expected that all will contribute equally to the final product and that they will share the single grade that is awarded for the ppt presentation. Students may use copyrighted figures, etc. from publications in the ppt presentation (if appropriate citations are given) because the ppt will only be posted on the access restricted WebCt website. However, if the team uses multiple copies of any copyrighted items (such as the pdf file of a copyrighted article), each student must download their own copy from the Georgia Tech library website rather than for one student to distribute the pdf.

In the event the assigned paper has been used by a previous class, students are not allowed to use any of the ppt slides in whole or part that were prepared by the other class.

3. Unless specifically identified as group work; quizzes, tests, take–home-tests, homework, etc. are to be completed alone.

4. For Quizzes/Tests: Cheating off of another person’s test or quiz is unethical and unacceptable. Cheating off of anyone else’s work is a direct violation of the GT Academic Honor Code, and will be dealt with accordingly. In exams, as much as possible, sit with ample space between you and other students to minimize the possibility of seeing other’s work.

5. Because the exams for this course change every semester, students may use old tests as study tools.

**Campus Resources for Students**

In your time at Georgia Tech, you may find yourself in need of support. Below you will find some resources to support you both as a student and as a person.

Academic support

•Center for Academic Success http://success.gatech.edu

o 1-to-1 tutoring http://success.gatech.edu/1-1-tutoring

o Peer-Led Undergraduate Study (PLUS) http://success.gatech.edu/tutoring/plus

o Academic coaching http://success.gatech.edu/coaching

•Residence Life's Learning Assistance Program

https://housing.gatech.edu/learning-assistance-program

o Drop-in tutoring for many 1000 level courses

•OMED: Educational Services (http://omed.gatech.edu/programs/academic-support)

o Group study sessions and tutoring programs

•Communication Center (http://www.communicationcenter.gatech.edu)

o Individualized help with writing and multimedia projects

•Academic advisors for your major

http://advising.gatech.edu/

**Accommodations for Individuals with Disabilities**

If you are a student with learning needs that require special accommodation, contact the Office of Disability Services at (404)894-2563 or http://disabilityservices.gatech.edu/, as soon as possible, to make an appointment to discuss your special needs and to obtain an accommodations letter. Please also e-mail me as soon as possible in order to set up a time to discuss your learning needs.

**Personal Support:** Georgia Tech Resources

•The Office of the Dean of Students: http://studentlife.gatech.edu/content/services; 404-894-6367; Smithgall Student Services Building 2nd floor

o You also may request assistance at

https://gatechadvocate.symplicity.com/care\_report/index.php/pid383662?

•Counseling Center: http://counseling.gatech.edu; 404-894-2575; Smithgall Student Services Building 2nd floor

o Services include short-term individual counseling, group counseling, couples counseling, testing and assessment, referral services, and crisis intervention. Their website also includes links to state and national resources.

O Students in crisis may walk in during business hours (8am-5pm, Monday through Friday) or contact the counselor on call after hours at 404-894-2204.

•Students’ Temporary Assistance and Resources (STAR): http://studentlife.gatech.edu/content/need-help

o Can assist with interview clothing, food, and housing needs.

•Stamps Health Services: https://health.gatech.edu; 404-894-1420

o Primary care, pharmacy, women’s health, psychiatry, immunization and allergy, health promotion, and nutrition

•OMED: Educational Services: http://www.omed.gatech.edu

•Women’s Resource Center: http://www.womenscenter.gatech.edu; 404-385-0230

•LGBTQIA Resource Center: http://lgbtqia.gatech.edu/; 404-385-2679

•Veteran’s Resource Center: http://veterans.gatech.edu/; 404-385-2067

•Georgia Tech Police: 404-894-2500

**Statement of Intent for Inclusivity**

As members of the Georgia Tech community, we are committed to creating a learning environment in which all of our students feel safe and included. Because we are individuals with varying needs, we rely on your feedback to achieve this goal. To that end, we invite you to enter into dialogue with us about the things we can stop, start, and continue doing to make our classroom an environment in which every student feels valued and can engage actively in our learning community.

**Additional information:**

**Can you use an older edition of the textbook (for example, the 3rd edition)?** The 3rd edition is similar to the 4th edition, as summarized generally below. However, considering how quickly this class moves along and the relatively low cost of the 4th edition, the 4th edition is worth the extra cost. If you will have difficulty affording the textbook, the library will have a copy on reserve and/or you can contact the instructors about other possible remedies.

**Table of Contents for Molecular Biology of Cancer: Mechanisms, Targets, and Therapeutics (Fourth Edition) by Lauren Pecorino (Oxford Press, 2016, ISBN: 9780198717348) and comments about how the topics covered in this chapter compare to where they were presented in the 3rd edition:**

1: Introduction (same # for 3rd edition)

2: DNA structure and stability: mutations versus repair (same # for 3rd edition)

3: Regulation of gene expression (same # for 3rd edition)

4: Growth factor signaling and oncogenes (same # for 3rd edition)

5: The cell cycle (same # for 3rd edition)

6: Growth inhibition and tumor suppressor genes (same # for 3rd edition)

7: Apoptosis (same # for 3rd edition)

8: Cancer stem cells and the regulation of self-renewal and differentiation pathways: focus on colon cancer and leukemias (same # for 3rd edition)

9: Metastasis (same # for 3rd edition)

10: Angiogenesis (not a separate chapter for 3rd edition)

11: Nutrient and hormone effects on the genome (same # for 3rd edition)

12: Tumour immunology and immunotherapy (some in #10 and #13 in 3rd edition)

13: Infectious agents and inflammation (not a separate chapter for 3rd edition, some in #10)

14: Technology and drug and diagnostics development (some overlap with #12 & 13 for 3rd edition)

**Examples of papers that have been presented in the Festival of Research Ideas in Cancer Biology and Technology by previous classes (these are examples only—teams should find other papers rather than use any of these):**

#1. An approach to suppress the evolution of resistance in BRAFV600E mutant cancer

Journal: Nature Medicine Volume: 6 Page: 929-937 Year: 2017

#2. Targeting cancer cell integrins using gold nanorods in photothermal therapy inhibits migration through affecting cytoskeletal proteins

Journal: PNAS Volume 114 Page 5655-5663 Year 2017

#3. Ultrasensitive Detection of Cancer Prognostic miRNA Biomarkers Based on Surface Plasmon Enhanced Light Scattering

Journal: ACS Sens. Volume 2, issue 5 Page 635-640 Year 2017

#4. IL8-CXCR2 pathway inhibition as a therapeutic strategy against MDS and AML stem cells.

Journal: Blood Volume: 125, issue 20 Page: 3144-3152 Year: 2015

#5. Anticancer drug-loaded quantum dots engineered polymeric nanoparticles: Diagnosis/therapy combined approach.

Journal: European Journal of Pharmaceutical Sciences Volume 107 Page 230-239

Year 2017

#6. Oncolytic Virotherapy Promotes Intratumoral T Cell Infiltration and Improves Anti-PD-1 Immunotherapy

Journal: Cell Volume: 170, issue 6 Page: 1109-1119 Year 2017

#7. Development of a T-cell Receptor Mimic Antibody against Wild-Type p53 for Cancer Immunotherapy

Journal: Cancer Research Volume 77, issue 10 Page 2699-2709 Year 2017

#8. Photo-controlled aptamers delivery by dual surface gold-magnetic nanoparticles for targeted cancer therapy

Journal: Materials Science and Engineering Volume 80 Page 88-92 Year 2017

#9. Active targeting of chemotherapy to disseminated tumors using nanoparticle-carrying T cells

Journal: Science Translational Medicine Volume 7 Page 291-294 Year 2015

#10. Intraoperative diagnostics and elimination of residual microtumors with plasmonic nanobubbles

Journal: Nature Nanotechnology Volume 11 Page 525-532 Year 2016

#11. MiR-320e is a novel prognostic biomarker in colorectal cancer

Journal: British Journal of Cancer Volume 113, issue 1 Page 83-90 Year 2015

#12. Quantifying Post- Laser Ablation Prostate Therapy Changes on MRI via a Domain-Specific Biomechanical Model: Preliminary Findings

Journal: PLOS one Volume 11, issue 4 (online) Year 2016

#13. Nuclear Membrane-Targeted Gold Nanoparticles Inhibit Cancer Cell Migration and Invasion

Journal: ACS Nano Volume 11, issue 4 Page 3716-3726 Year 2017

#14. Pretargeted Positron Emission Tomography Imaging That Employs Supramolecular Nanoparticles with in Vivo Bioorthogonal Chemistry

Journal: ACS Nano Volume 10, issue 1 Page 1417-1424 Year 2016

#15. Precision Tumor Recognition by T Cells With Combinatorial Antigen-Sensing Circuits

Journal: Cell Volume 164 Page 770-779 Year 2016