Course Description

Students will explore the current state of the art in immuno-oncology: the therapeutic approach designed to activate a patient’s own immune system against cancer. This approach has recently garnered significant excitement as previously incurable cancers are seeing remarkable remissions. The course will provide a brief overview of cancer and the immune system, with a focus on the novel treatments of checkpoint inhibitors and chimeric antigen receptor transgenic therapies. This is a second-year colloquium course and requires the students to have either completed or to be concurrently enrolled in introductory biology.

Required Course Materials


Other materials: none

Course Objectives and Expected Learning Outcomes:

By participating in the class, students will be able to:

• Understand the basic cause, progression and treatments of cancer in relation to the immune system
• Appreciate the process of cancer development, drug development and clinical treatments
• Consider the ethical implications of novel drug development

Schedule of Topics and Activities

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Activity</th>
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</thead>
<tbody>
<tr>
<td>8-25-21</td>
<td>What is cancer? Focus on solid tumors</td>
<td>In-class Discussion</td>
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<tr>
<td>9-1-21</td>
<td>What is cancer? Focus on liquid tumors</td>
<td>In-class Discussion</td>
</tr>
<tr>
<td>9-8-21</td>
<td>Key components of the immune system</td>
<td>In-class Discussion</td>
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<tr>
<td>9-15-21</td>
<td>The internal fight against cancer: Activation</td>
<td>In-class Discussion</td>
</tr>
<tr>
<td>9-22-21</td>
<td>The internal fight against cancer: Suppression</td>
<td>Chapter 1 and model</td>
</tr>
<tr>
<td>9-29-21</td>
<td>Chapter 1: James Allison and CTLA-4</td>
<td>Chapter 1 and model</td>
</tr>
<tr>
<td>10-6-21</td>
<td>Chapter 2: Jedd Wolchok and CTLA-4</td>
<td>Chapter 2 and model</td>
</tr>
<tr>
<td>10-13-21</td>
<td>Chapter 3: Axel Hoos and CTLA-4</td>
<td>Chapter 3 and model</td>
</tr>
<tr>
<td>10-20-21</td>
<td>Chapter 6: Susanne Topalian and PD-1</td>
<td>Chapter 6 and model</td>
</tr>
<tr>
<td>10-27-21</td>
<td>Chapter 15: Patrick Hwu and CAR-Ts</td>
<td>Chapter 15 and model</td>
</tr>
<tr>
<td>11-3-21</td>
<td>Chapter 16: Carl June and CAR-Ts</td>
<td>Chapter 16 and model</td>
</tr>
<tr>
<td>11-10-21</td>
<td>Chapter 17: Michel Sadelain and CAR-Ts</td>
<td>Chapter 17 and model</td>
</tr>
<tr>
<td>11-17-21</td>
<td>Laurence Zitvogel and the microbiome</td>
<td>Chapter 25 and model</td>
</tr>
<tr>
<td>11-24-21</td>
<td>No class, Thanksgiving break</td>
<td></td>
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<tr>
<td>12-1-21</td>
<td>Immunotherapy summary and future directions</td>
<td>Discussion</td>
</tr>
</tbody>
</table>

Attendance and Class Participation Policies

MCB 295A is an active colloquium where students are expected to attend class ready to discuss the week's reading and participate in the related activities. As such weekly attendance and participation are required. Exceptions will be made for conflicts due to University-authorized commitments (pre-approved by the
UA Dean of Students), or holidays observed by organized religion with which you are affiliated provided the instructor is contacted before the discussion is missed, proper documentation is provided, and a make-up assignment is completed within one week of the absence. At the instructor’s discretion, some form of accommodation may be made in the event of extraordinary circumstances such as serious illness, accident, or family emergency.

The UA’s policy concerning Class Attendance, Participation, and Administrative Drops is available at: http://catalog.arizona.edu/policy/class-attendance-participation-and-administrative-drop

The UA policy regarding absences for any sincerely held religious belief, observance or practice will be accommodated where reasonable, http://policy.arizona.edu/human-resources/religious-accommodation-policy.

Absences pre-approved by the UA Dean of Students (or Dean Designee) will be honored. See: https://deanofstudents.arizona.edu/absences

Required Course Activities, Assignments/Exams

In-Class Discussion and Activities (12): Students will participate in discussions and work on related problem sets. Students will turn in weekly assignments based on these activities.
- Each assignment will be graded for content and is worth 5 points. Total points: 60

Active Learning activity (12): Students will work on class materials after class, and turn-in these assignments in the following class.
- Each assignment will be given participation points worth 3 points. Total points: 36

Final Paper: One 2-page paper is due at the end of the semester, to be focused on either Checkpoint inhibitors or CAR-T cells. The paper should cover the basic science (how does it work, what is it designed to do), clinical translation (in clinical trials, how well does it work, and under what circumstances), and any toxicities observed.
- Margins, .5-1 inch, font: arial, 12, double spaced.
- Due date is shown on calendar, to be uploaded to d2l assignments (note that the essay will be run through Turn It In to verify originality).
- Total points: 104

Grading Scale and Grade Policies

There is no curving. Make-ups will only be given in cases of documented emergencies or Dean of Students-excused absences and must be requested within 48 hours of the assignment date. A maximum of 2 make-ups will be allowed.

Grades will be awarded as follows:

<table>
<thead>
<tr>
<th>Grade</th>
<th>Cutoffs</th>
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<tbody>
<tr>
<td>S (superior)</td>
<td>180-200</td>
</tr>
<tr>
<td>P (pass)</td>
<td>120-179</td>
</tr>
<tr>
<td>F (fail)</td>
<td>&lt; 119</td>
</tr>
</tbody>
</table>

Requests for incomplete (I) or withdrawal (W) must be made in accordance with University policies, which are available at http://catalog.arizona.edu/policy/grades-and-grading-system#incomplete and http://catalog.arizona.edu/policy/grades-and-grading-system#Withdrawal respectively.

Late Assignments Policy: All assignments are due either during the class period they are assigned (in-class discussions) or on the date listed on d2l for the final paper.

Extra credit policy: There will be no extra credit

Classroom Behavior Policy

To foster a positive learning environment, students and instructors have a shared responsibility. We want a safe, welcoming, and inclusive environment where all of us feel comfortable with each other and where we can challenge ourselves to succeed. To that end, our focus is on the tasks at hand and
not on extraneous activities (e.g., texting, chatting, reading a newspaper, making phone calls, web surfing, etc.).
Students are asked to refrain from disruptive conversations with people sitting around them during discussion. Students observed engaging in disruptive activity will be asked to cease this behavior. Those who continue to disrupt the class will be asked to leave lecture or discussion and may be reported to the Dean of Students.

Threatening Behavior Policy
The UA Threatening Behavior by Students Policy prohibits threats of physical harm to any member of the University community, including to oneself. See http://policy.arizona.edu/education-and-student-affairs/threatening-behavior-students.

Accessibility and Accommodations for Students with Disabilities
At the University of Arizona, we strive to make learning experiences as accessible as possible. If you anticipate or experience physical or academic barriers based on disability or pregnancy, you are welcome to let me know so that we can discuss options. You are also encouraged to contact Disability Resources (520-621-3268) to explore reasonable accommodation.
If our class meets at a campus location: Please be aware that the accessible table and chairs in this room should remain available for students who find that standard classroom seating is not usable.

Academic Integrity Policies
Students are encouraged to share intellectual views and discuss freely the principles and applications of course materials. However, graded work/exercises must be the product of independent effort unless otherwise instructed. Students are expected to adhere to the UA Code of Academic Integrity as described in the UA General Catalog.
See: http://deanofstudents.arizona.edu/codeofacademicintegrity http://deanofstudents.arizona.edu/academic-integrity/students/academic-integrity.
The University Libraries have some excellent tips for avoiding plagiarism, available at http://new.library.arizona.edu/research/citing/plagiarism.

Selling class notes and/or other course materials to other students or to a third party for resale is not permitted without the instructor’s express written consent. Violations to this and other course rules are subject to the Code of Academic Integrity and may result in course sanctions. Additionally, students who use D2L or UA e-mail to sell or buy these copyrighted materials are subject to Code of Conduct Violations for misuse of student e-mail addresses. This conduct may also constitute copyright infringement.

UA Nondiscrimination and Anti-Harassment Policy
The University is committed to creating and maintaining an environment free of discrimination; see http://policy.arizona.edu/human-resources/nondiscrimination-and-anti-harassment-policy
Our classroom is a place where everyone is encouraged to express well-formed opinions and their reasons for those opinions. We also want to create a tolerant and open environment where such opinions can be expressed without resorting to bullying or discrimination of others.

Additional Resources for Students
UA Academic policies and procedures are available at http://catalog.arizona.edu/policies
Student Assistance and Advocacy information is available at http://deanofstudents.arizona.edu/student-assistance/students/student-assistance

Confidentiality of Student Records

Subject to Change Statement
Information contained in the course syllabus, other than the grade and absence policy, may be subject to change with advance notice, as deemed appropriate by the instructor.