

RADI 6091-2 Special Topics
ImmunoPET Imaging
Spring 2020

CLASS DAYS and TIME: January 6 - May 8, 2020 Wednesdays from 9 to 10 am
CLASSROOM: McDermott Clinical Sciences Building /Research Imaging Institute McD:2.534
COURSE FACULTY: Sidath C. Kumarapperuma, PhD – Course Director
OFFICE LOCATION and HOURS: McDermott Building 2.408, by appointment
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COURSE DESCRIPTION AND OBJECTIVES

This Special Topics course will provide an introduction to Molecular Imaging, Positron Emission Tomography (PET) Imaging, and ImmunoPET Imaging with an emphasis on the applications of novel ImmunoPET Imaging techniques. This type of medical imaging provides detailed visual information of what is happening inside the body at the molecular and cellular level. Immuno-PET can non-invasively investigate kinetics of immune responses to further understand their role in cancers, infectious diseases and inflammation. ImmunoPET allows to visualize the disease progression and/or how the disease responds to therapy in 3D. While other diagnostic imaging procedures—such as x-rays, computed tomography (CT) and ultrasound—predominantly offer anatomical information, Molecular Imaging allow physicians to visualize the *function* and, enable quantitative measurement of its chemical and biological processes. This course will appreciate the novel Immuno-PET imaging approaches that are being developed in pre-clinical disease models and how they can be translated into clinics. The format will allow students to develop skills of in-depth critical analysis and will involve a combination of student presentations of current data and discussions of the historical development and evolution of new directions in PET imaging research.

Pre-requisites – None

Semester credit hours – 1 credit hour

By the end of this course, each student should be able to:

- Obtain understanding in both technical and scientific abilities.
- Be familiar with procedures and technologies related to the modalities under study.
- Critically review research literature and synthesize scientific data.
- Communicate their understanding of the topics both in oral and written formats effectively.

COURSE ORGANIZATION

The main teaching modalities used in this course include:

- Reading and critical analysis of scientific literature.
- Develop scientific thinking and experiment planning based on research.
- Develop presentation skills in oral and written formats.

Materials – Equipment and supplies required for their project will be based on individual student's needs.

Computer Access – Computer will be offered by faculty if needed. It is also suggested the student have a laptop to use for their assignments.

Reading Assignments – Assignments will be suggested by the faculty. Students should be actively engaged in paper reading and analysis weekly, if not daily, on their research topic.

Class requirements –

Paper presentations – Students will prepare a 40-minute oral presentation (e.g. PowerPoint) on the assigned paper or papers in consultation with the faculty. Student presentations should include:

1. A single page summary highlighting the significance of the paper (to be emailed to the faculty along with a PDF copy of the original article at least one day before the presentation. Format: PDF, page size: letter, margins: all sides 1 inch, font size: 11).
2. A thorough and relevant introduction of the background for the topic, including but not limited to the literature citations in the assigned papers being presented.
3. Presentation and explanation of the rationale for the overall hypothesis being tested.
4. A clear description of the hypothesis itself.
5. Clear descriptions and explanations of the experimental approaches used for testing the hypothesis and conclusions made in the paper.
6. The presenter should be prepared to answer the question: "What should be the next step?".

Discussions - Each student is expected to read all the papers and prepare for an in-depth discussion of each paper(s), regardless of who is presenting the paper(s). Following the 40 min presentation, students will be randomly selected to further discuss individual figures and experimental results in detail, to critically analyze the results and propose alternative experiments if the original experiments failed to adequately support the authors' conclusions. These activities will help the students to develop the skills for identifying potential pitfalls of a given experimental approach and for proposing alternative strategies later in their scientific career.

List of articles for class: To be announced

ATTENDANCE

Attendance is mandatory. Students are expected to attend all classes and to be on time. In cases of illness or other serious event, the student is responsible for all materials presented on that day. There will be no makeups for missed lectures.

TEXTBOOK

None. Web resources including online journals and E-books will be used.

GRADING POLICIES AND EXAMINATION PROCEDURES

The grade scale used is Satisfactory (S) and Unsatisfactory (U). It is the prerogative of the course director to determine if grades of Honors (H), Incomplete (I) or In Progress (IP) are warranted.

Grading System

Satisfactory (S) = 70-100% Unsatisfactory (U) = < 70%

REQUESTS FOR ACCOMODATIONS FOR DISABILITIES

In accordance with policy 4.2.3, **Request for Accommodation Under the ADA and the ADA Amendments Act of 2008 (ADAAA)**, any student requesting accommodation must submit the appropriate request for accommodation under the American with Disabilities Act (ADA, form 100). to his/her appropriate Associate Dean of their School and a copy to the ADA Coordinator. Additional information may be obtained at <http://uthscsa.edu/eo/request.asp>.

ACADEMIC INTEGRITY AND PROFESSIONALISM

Any student who commits an act of academic dishonesty is subject to discipline as prescribed by the UT System Rules and Regulations of the Board of Regents. Academic dishonesty includes, but is not limited to, cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an exam for another person, signing attendance sheets for another student, and any act designed to give unfair advantage to a student or the attempt to commit such an act. Additional information may be obtained at,

<http://catalog.uthscsa.edu/generalinformation/generalacademicpolicies/scholasticdishonestypolicy/>

TITLE IX AT UTHSCSA

Title IX Defined: Title of the Education Amendments of 1972 is a federal law that prohibits sex discrimination in education. It reads "no person in the United States shall, on the basis of sex, be excluded

from participation in, be denied the benefits of, or be subjected to discrimination under any education program or activity receiving Federal financial assistance.”

University of Texas Health Science Center San Antonio’s Commitment:

University of Texas Health Science Center San Antonio (UTHSCSA) is committed to maintaining a learning environment that is free from discriminatory conduct based on gender. As required by Title IX, UTHSCSA does not discriminate on the basis of sex in its education programs and activities, and it encourages any student, faculty, or staff member who thinks that he or she has been subjected to sex discrimination, sexual harassment (including sexual violence) or sexual misconduct to immediately report the incident to the Title IX Director. In an emergency, victims of sexual abuse should call 911. For non-emergencies, they may contact UPD at 210-567- 2800. Additional information may be obtained at <http://students.uthscsa.edu/titleix/>

EMAIL POLICY

Every student is issued a University email address and account at the time of enrollment. As a matter of University Policy, communications between students and faculty that occur using the student’s University e-mail address is considered official business. Therefore, **students are expected to check their university email inboxes on a regular basis** so that any announcements, instructions or information regarding this course will be received in a timely manner.

USE OF RECORDING DEVICES

Recording devices are allowed if approved by speaker or required for compliance with the Americans with Disabilities Act (ADA).

ELECTRONIC DEVICES

Cell phones must be turned off during all class meetings. Computers and electronic tablets are allowed only for participating in classroom activities (e.g., viewing slides presented in lecture or course materials).

TENTATIVE CLASS SCHEDULE

Week	Date (9-10 am)	Topic	Assignments	Instructor
Week 1	1/8/20	Introduction to Molecular Imaging	TBD	Dr. Kumarapperuma
Week 2	1/15/20	Introduction to Nuclear Medicine and PET imaging	TBD	Dr. Kumarapperuma
Week 3	1/22/20	Census - No Class		
Week 4	1/29/20	Introduction to Radiopharmaceuticals	TBD	Dr. Kumarapperuma
Week 5	2/5/20	Introduction to PET Probe Design	TBD	Dr. Kumarapperuma
Week 6	2/12/20	Discussion on Relevant Instrumentation	TBD	Dr. Kumarapperuma
Week 7	2/19/20	Discussion on other Molecular Imaging Techniques in comparison to PET	TBD	Dr. Kumarapperuma
Week 8	2/26/20	ImmunoPET in Cancer – I	TBD	Dr. Kumarapperuma
Week 9	3/4/20	ImmunoPET in Cancer – II	TBD	Dr. Kumarapperuma
Week 10	3/11/20	Spring Break – No Class		
Week 11	3/18/20	ImmunoPET in Cancer – III	TBD	Dr. Kumarapperuma
Week 12	3/25/20	ImmunoPET Beyond Cancer – I	TBD	Dr. Kumarapperuma
Week 13	4/1/20	ImmunoPET Beyond Cancer - II	TBD	Dr. Kumarapperuma
Week 14	4/8/20	TBD - Literature Review & Discussion	TBD	Dr. Kumarapperuma
Week 15	4/15/20	TBD - Literature Review & Discussion	TBD	Dr. Kumarapperuma
Week 16	4/22/20	TBD - Literature Review & Discussion	TBD	Dr. Kumarapperuma
Week 17	4/29/20	TBD - Literature Review & Discussion	TBD	Dr. Kumarapperuma
Week 18	5/6/20	Overall Review and Future Directions	TBD	Dr. Kumarapperuma