



The University of Chicago
Graduate Program in Medical Physics
Departments of Radiology and Radiation & Cellular Oncology
5841 S. Maryland Avenue
Chicago, IL 60637

Committee on Medical Physics

The 2nd Charles E. Metz, Ph.D.

Special Topics Course

“Fundamentals of Molecular Imaging”

Public Lectures



- **Molecular Imaging of the Immune System**
Thursday, November 30, 2017; 3 – 4:15 p.m.; Billings Auditorium P-117
- **Precision Health and Integrated Diagnostics**
Friday, December 1, 2017; 9:30 – 10:45 a.m.; KCBD Auditorium 1103



Invited Lecturer

Sanjiv Sam Gambhir M.D., Ph.D.

Virginia and D. K. Ludwig Professor of Cancer Research
Chair, Department of Radiology
Professor by courtesy, Departments of Bioengineering and
Materials Science & Engineering
Director, Molecular Imaging Program at Stanford (MIPS)
Director, Canary Center at Stanford for
Cancer Early Detection
Stanford University School of Medicine

These lectures are made possible by Becky Metz Mavon, Molly Metz, and the supporters of the Charles E. Metz, Ph.D. Memorial Endowed Fund.

Persons with a disability who need assistance, please call 773-834-7769

Lecture #19 - Molecular Imaging of the Immune System

Sanjiv Sam Gambhir MD, PhD, Stanford University

Time: 3-4:15pm

Date: Thursday, 11/30/2017

Place: Billings P-117

Medical Physics and Radiology Q&A and Discussion

Time: 4:15-5:00pm

Place: Kodak Conference Room: P-118

Strategies for imaging of the immune system in small animal models and in patients are rapidly expanding. The ability to track cell populations (e.g., T cells) as well as specific immune cell receptors (e.g., CD20, CD8) are leading to a greater understanding of the complexity of the immune system in action in living subjects. Particular emphasis on cancer immunotherapy will be highlighted. The ability to use PET imaging to predict and monitor response to therapy will be detailed. I will present some of our latest work in monitoring immune cells with positron emission tomography (PET) reporter genes in cancer patients. I will also discuss future directions for the field and new areas of needed research.

Lecture #20 - Precision Health and Integrated Diagnostics

Sanjiv Sam Gambhir MD, PhD, Stanford University

Time: 9:30-10:45am

Date: Friday, 12/1/2017

Place: KCB D 1103

Medical Physics and Radiology Q&A and Discussion

Time: 10:45-11:30am

Place: KCB D Conference Room: 1280

Most of the world's health care systems are focused on patients after they present with disease, and not before. While precision medicine uses personalized information to more effectively treat disease, the emerging field of precision health is situated to help assess disease risks, perform customized disease monitoring, and facilitate disease prevention and earlier disease detection. Currently an individual's health is evaluated only a few times a year if at all, making it difficult to gather the amount of information needed to implement precision health. The emergence of continuous health monitoring devices with combined *in vitro* and *in vivo* (integrated) diagnostics, worn on the body and used in the home, will enable a clearer picture of human health and disease. However, challenges lie ahead in developing and validating novel monitoring technologies, and in optimizing data analytics to extract meaningful and actionable conclusions from continuous health data. This presentation will show some of the emerging technologies for diagnostics with a focus on cancer and the challenges to making precision health a reality in the decades to come.