

# CELLBIO 211| Systems Level Cancer Cell Biology



Mondays & Wednesdays  
Jan 22-Apr 24



1:00 – 2:30pm



Longwood Campus



Expose to wide range of topics  
Build scientific communications skills

## COURSE DESCRIPTION

This semester long course will explore molecular basis of cancer formation through introduction of a wide range of topics that highlight foundational research and concepts, current major findings, and future directions. You will learn how cancer cells reprogram metabolism to feed their own needs, and that in over 50% of human cancers mutations are present in genes encoding chromatin-associated proteins and protein complexes. To understand the impact of cancer genomes on individual proteins, biochemical complexes, or signaling networks, you'll interrogate the functional proteome, and you'll take a step back to understand how the properties of cellular systems might be perturbed in cancer. Deep dive into cancer cells will reveal that even within the same tumor, cells can display startling differences for many features making intratumor heterogeneity a major obstacle toward understanding and treatment of cancers. You will learn about small molecule probes and how they offer a unique opportunity to understand the biological rationale for potential cancer therapeutics, how immune cells employ different cellular and molecular mechanisms to eliminate transformed cells, and you will learn about the rapid pace of cancer drug development highlighting results from recent clinical trials that have led to transformative FDA approvals. The topics are organized into eight modules and led by one faculty member. Faculty joining us this Spring are experts in the various fields and will provide you with an integrated perspective on past, current, and future approaches in cancer biology research. Modules consist of three sessions – an introductory lecture that provides an overview of the topic, a keynote lecture that talks about recent discoveries in the field, and a group discussion that gives you the opportunity to synthesize the knowledge and think critically about the scientific questions in the field, while focusing on building and improving scientific communication skills through the practice of presentation, discussion, and peer evaluation & feedback.

## COURSE OBJECTIVES

- Understand foundational discoveries that led to major concepts in the field
- Describe the molecular basis of cancer formation
- Identify big open questions in the research areas around the course topics
- Synthesize and implement content knowledge while practicing your presentation skills
- Practice providing evaluation and feedback to your peers



introductory lecture



keynote lecture



small group discussion



Cancer Metabolism  
Naama Kanarek, PhD

Decoding Tumor Heterogeneity  
Kornelia Polyak, MD, PhD



Cancer Epigenetics  
Zuzana Tothova, MD, PhD

Using Chemistry to Conquer Cancer  
Jun Qi, PhD



Functional Proteomics  
Jarrod Marto, PhD

Immune Therapy in Cancer  
Stephanie Dougan, PhD



Cancer Cell Interactome  
Marc Vidal, PhD

Advances in Cancer Drug Development  
Geoff Shapiro, MD, PhD



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