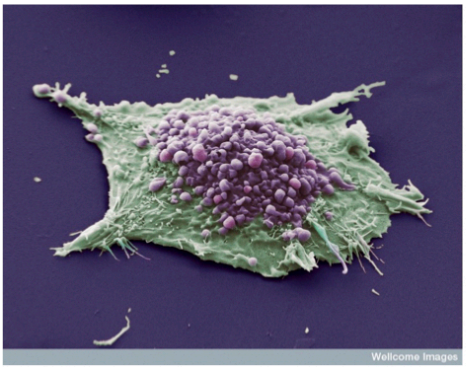

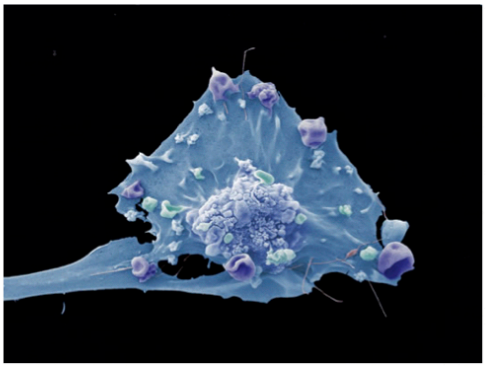
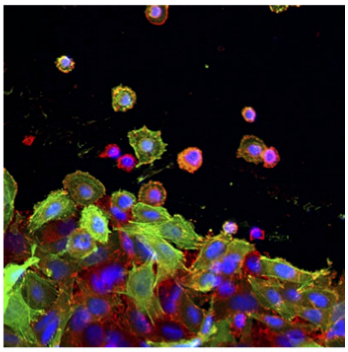

BIOL 4260 – Cellular Mechanisms – SPRING 2017 – Focus on Cancer

Course Description

This course will use a case study approach to examine recent advances in cancer biology. The overall goal is to examine specific regulatory or mechanistic events that underlie aberrant cell proliferation and their associated molecular components that may serve as new therapeutic targets. This exemplifies the transition from "basic" to "translational" research. We will explore novel treatment options under development and consider their relative strengths and weaknesses. We will also discuss new findings illustrating the increasing complexity of this disease; for example, tumor suppressors that also function as oncogenes. Assigned reading will come from the primary scientific literature. As such, a major objective of this course will be to provide an opportunity, to learn how to critically read, interpret, and evaluate primary research papers. Although no textbook will be used, relevant background material can be found in the Lodish et al Molecular Cell Biology text used in BIOL 3000 which is the sole course prerequisite for BIOL 4260.

Course Objectives

The overall goal of BIOL 4260 is for you to gain experience in critically reading and assessing the primary scientific literature and to learn to think like an experimental molecular cell biologist addressing "translational research" in cancer biology. By the end of this course you will be able to:

1. Critically read and assess, interpret, and present the data and conclusions posed in primary research articles.
2. Describe and explain the pertinent molecular and cellular processes that underlie the specific cancers and neoplastic processes under discussion.
3. Describe and explain how specific genes and/or their mRNA or protein products can be validated as therapeutic targets to develop new treatment options and approaches.
4. Identify the strengths and weaknesses of different drug discovery approaches utilized to develop new therapeutic options for different types of cancer.
5. Develop the ability to work collaborative in a "team setting".

Meeting Times and Location 9:30 – 10:45 AM Tues., Thurs., GIL 141

Instructor Information

Mike Wormington, Associate Professor of Biology. My hometown is Overland Park, Kansas, and I attended the University of Kansas (Go Jayhawks!) where I earned my BA with Honors in Biology and my PhD in Biochemistry. I was an NIH Postdoctoral fellow at the Carnegie Institution for Science, Dept. of Embryology, in Baltimore, MD. I joined the UVa Biology faculty in 1989 and have taught Cell Biology since 1992 and Cellular Mechanisms at various times in recent years. My longstanding research interest is the regulation of gene expression during oogenesis and embryogenesis and the interplay between genetic and metabolic reprogramming in cancer stem cells. My wife Susan, is the Art Director at UVa's Darden School of Business. Our two daughters and sons-in-law and our three grandchildren keep us busy. What do I do for fun? I'm a Lieutenant Colonel and search and rescue mission pilot and the director of operations for the Virginia wing of the Civil Air Patrol, which is the civilian auxiliary of the US Air Force.

Office: PLSB 206 Phone: 982-5803 email: ww2t@virginia.edu
Office Hours: 2PM – 4PM Weds. & by appointment

Collab Website

The BIOL 4260 Collab Course site is an important resource that you will use to access assigned readings. The Resources section will contain pdf files of assigned readings and any pertinent powerpoint slides for each case study. Each reading assignment will have an associated list of questions that will serve as the basis for class discussions. Since this will be a discussion-based course, you will be expected to complete the assigned reading and go over the pertinent questions *before* the class in which they will be covered.

Evaluation and Grading

This is a discussion-intensive class. Therefore, class attendance and active participation are essential. You will be working in small groups to discuss and present the assigned papers. Initially you will be using a set of specific questions that I will prepare beforehand as guidelines for your discussions and presentations. As the course progresses, your group will have to come up with the questions to guide the class through the assigned papers. Finally, your groups will choose your own papers based on your collective interests and guide class discussions of them. You will be evaluated based on your participation and contributions to both your individual group and entire class discussions and exercises. There will be no formal exams. Additional details will be provided once the course is underway.

Important College Dates

- Add Deadline: Weds. Feb. 1
- Drop Deadline: Thurs. Feb. 2
- Spring Break: Tues. Mar. 7 & Thurs. Mar. 9 (No class)
- Withdrawal Deadline: Weds. Mar. 15

Case Studies for Spring 2017 (not necessarily all inclusive nor in chronological order)

Targeting a rogue transcription factor in acute myeloid leukemia

Drug repurposing to target resistant BCR-ABL1 in chronic myeloid leukemia

The dark side of $p21^{CIP}$

The enigma of Rb

Vitamin C targeting KRAS & BRAF colon cancer

p53 gain of function mutations alter the proteasome

Channeling K^+ to fight cancer

Targeting BiP to treat melanoma

Drugging the “undruggable” Ras