

## CHEM 95 B: A Biography of Cancer

MWF 1:10 – 2:00 pm, Given C-443

University of Vermont

### CONTACT INFORMATION:

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Office Hours:  
Monday 10:00 – 11:30am  
Thursday 2:00 – 3:30pm

### TEXTBOOKS:

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Ken Burns, <i>Cancer: The Emperor of All Maladies</i>	<b>required</b>	cancerfilms.org
Mukherjee, <i>The Emperor of All Maladies: A Biography of Cancer</i>	recommended	9781439107959
		9781439181713 (e-book)
Weinberg, <i>One Renegade Cell: How Cancer Begins</i>	reference	9780465072767
King & Robins, <i>Cancer Biology</i>	reference	9780131294547
Weinberg, <i>The Biology of Cancer</i>	reference	9780815342205

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### COURSE DESCRIPTION:

What is cancer? How is it caused, and can it be prevented? What approaches have been used to treat cancer in the past, and how have they led to current treatments? We are frequently exposed to these questions in our lives, whether through the popular media or by a personal connection to cancer. In this course, a multidisciplinary approach will be used to describe the identity of cancer and to probe the history and success of cancer treatments. Some science background is desirable, but the course is intended to be accessible to non-specialists as well as those with declared science majors. Class time will be primarily devoted to discussing relevant sections of assigned texts, and student participation is expected. Some lectures will be replaced by tours of hospital laboratories, laboratory experiments, and student presentations.

Presenting a broad-based introduction to cancer requires the participation of people with a variety of expertise. You will hear from clinicians, oncologists, and pathologists from the UVM Medical Center, as well as chemistry, sociology, statistics, biochemistry, and pharmacology faculty members from the Colleges of Arts & Sciences, Engineering & Mathematical Sciences, and Medicine. The course is structured into subunits of several lectures each, dealing with discrete topics (for example, the history of cancer diagnosis and treatment; cancer biology and biochemistry; a modern model of cancer development; cancer pathology and diagnosis; current treatment; sociological impacts). I think this is exciting because you're hearing about cancer from the people who work with it on a daily basis. On the other hand, this rotating cast of characters might make it difficult to keep track of what's going on, and to know what's expected of you. To help provide some continuity, I will **attend every lecture** with you, regardless of whether I am the primary lecturer or not. In addition, I will hold **weekly office hours** (see above), so you will always have a resource to use as questions arise.

I am also available to meet by appointment, and I am usually available by e-mail. Other lecturers will let you know about their availability to answer your questions as the course progresses, but I will always be available to answer questions.

Four books (see above) will be used in this class. Siddhartha Mukherjee's book "*The Emperor of All Maladies: A Biography of Cancer*" is a good introduction to the field of cancer research and treatment. I like this book because it is written by a cancer physician, and it introduces some relatively complicated scientific topics in a way that non-specialists can understand. It also has themes of patient care and treatment that are absent from purely scientific texts. It's a good way to connect a lot of different cancer-related topics. Since the last time this course was taught, PBS has made a documentary based on *The Emperor of All Maladies*, and watching that documentary will be a required part of our class.

On the other hand, you will encounter some detailed scientific information in this course. Three **recommended books** will be available on reserve in Bailey-Howe Library to provide you with more background on these topics, and you may want to purchase these books too. Selected sections from these recommended books may be assigned to read as the course progresses. Other material (articles from magazines and newspapers; images of cells and cancer tissues; medical data) will also be available on the course's **Blackboard website**.

The amount of detailed material in this course might be a bit daunting. Consequently, three "**catch up**" **days** have been set aside throughout the semester, during which I will lead a group discussion of recent lecture material and will address any questions. No new material will be introduced during these lectures.

Not everyone who takes this course will end up doing cancer research. But I hope that you will leave with a new perspective on cancer, so that when someone asks you "What is cancer?" you will have a sense of the subtlety and complexity associated with the answer.

ASSESSMENT:

<b>Activity</b>	<b>Due</b>	<b>Points</b>
Lab report: Cancer Tissue and Microscopy Labs	Monday, October 21	100
Posts to Blackboard discussion before panel	Monday, November 7	50
Posts to Blackboard discussion after panel	Monday, November 14	50
Paper/presentation: mock tumor board	Friday, December 2 — Wednesday, December 7	120
Online quizzes (all Mondays)	September 12, 19, 26; October 3, 17; November 7, 28; December 5	40
Class participation	--	40
<b>Total</b>		<b>400</b>

These assessments are meant to address three key questions from the course:

1. *What does cancer look like?* Two laboratory experiences will replace lectures in September and October. The first one is a study of cancer tissues, informally called the "Cancer Museum"; you will be led through a laboratory containing many different types of actual cancer tissues that have been removed from patients. In the second one, you will work in two-person teams to compare normal and cancerous tissues using microscopy and staining. You are required to submit a **laboratory report** summarizing your responses to

guided questions from these experiences. Grading will be based on the content, length, and format of the report.

2. *How does cancer affect us?* A public panel discussion on health care and treatment issues will be scheduled in the evening outside of class at the beginning of November (class will be cancelled on this date). In addition to attending the panel, you are required to **write a minimum of a paragraph** describing questions you plan to ask the panel members and why those questions are important to you, and to **respond** to at least one other student's post. After the panel, you are required to **post another paragraph** indicating how the panel impacted your understanding of the material, and to **post another response**. Grading will be based on the content and length of the Blackboard posts and on participation during the panel.

3. *How is cancer treated?* The last section of the course deals with clinical presentation, diagnosis, and treatment. In this exercise, you will work in four-person teams to act as your own "tumor board" – the group of doctors in a hospital who assign a treatment regimen to a patient based on tissue biopsies, MRIs, and other information. The board is the point at which science transitions from the laboratory to real life. You will be supplied with actual information about a patient, and after discussing this information, your team will **present its treatment** to the class; the treatment will be discussed by the entire group, and the actual treatment that was assigned will be revealed. **Individual papers** will be submitted, which will summarize the tumor board assignment and will tie in as much specific information from the class as possible. Individual grades will be based on the extent of the presentation and paper and the amount of material included in the paper.

You will take **nine quizzes** during the course of the class. These short quizzes (2 – 3 questions each) are meant to help you keep pace with the material in the class. They will all be available on Blackboard on the Mondays indicated above, and they will only be based on the previous week's material, unless otherwise indicated in class. Your **lowest quiz score will be dropped** to arrive at the total number of quiz points.

A small number of points have been set aside for **class participation**, to include all aspects of the class. While it might not seem like much, these points can make the difference between one letter grade and another! You are encouraged to take class participation seriously and simply to ask questions when you have them.

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*The instructor reserves the right to change everything, with notice.*

