Bio 336/391M - TUMOR BIOLOGY (Spring '11)

Last updated: Jan. 28, 2011

Instructor:

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General Info:

MWF, 12:00 - 1:00
Burdine Hall, Room 108
Bio 336 - unique number 50115
Bio 391M - unique number 51120

Office Hours:

Tuesdays, 9:00 - 10:30
Fridays, 10:30 - 12:00

Final Exam: Thursday, May 12, 9:00-12:00 noon

Prerequisites for Bio 336 (for undergraduates):

Biology 325 (Genetics), and either Biology 330 (Animal Virology) or 360K (Immunology), all with a grade of at least C.

Assigned Readings:

Readings will be assigned for each lecture and will consist primarily of review papers taken from a variety of scientific journals (e.g., Cell, Science, Nature, Nature Cancer Reviews, Oncogene, Seminars in Cancer Biology).
All assigned reading will be freely available on the internet and links to the readings and/or PDF files will be posted on this site. Some readings will be from on-line textbooks, including Cancer Medicine.

While there is no required textbook, you are strongly encouraged to seek out relevant texts as needed.
A very good recent textbook is Robert Weinberg's The Biology of Cancer.

Some on-line textbooks that are very useful include:
Molecular Biology of the Cell (Alberts)
The Cell (Geoffrey Cooper)
Molecular Cell Biology (Lodish)
Retroviruses (Coffin, et al.)
Any good biochemistry text, such as Biochemistry (Stryer)
Any good genetics text such as Modern Genetic Analysis or Introduction to Genetic Analysis
All of these are available to you fee of charge at BOOKS at PubMed

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Exams, Grading, Attendance: Grades will be based on three in-class exams and a final exam (dates below). Final grade distributions will be adjusted (i.e., "curved") based on overall class performance; grades for undergraduate (Bio 336) and graduate (Bio 391M) sections will be determined separately. Attendance may be taken periodically during the course and greater than three unexcused absences may result in final grade penalty at the discretion of the instructor.

Exam 1: 100 points Feb. 16, in class.
Exam2: 100 points Mar. 23, in class.
Exam 3: 100 points Apr. 11, in class.
Final Exam: 200 points May 12, 9-12 am.
Total: 500 points*

Half of the final (100 points) will be from the last quarter of the class (the material between the third exam and the end of the course), and half will be cumulative over the entire course.

*In addition, up to three unannounced quizes may be given during the semester. These will count for a maximum of 20 points each beyond the 500 exam points.

Spring 2011 academic calendar from the Registrar's office: Important dates

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Course schedule:

1 W, Jan. 19 Brief Course Overview

Intro: Powerpoint PDF

Reading: Hanahan and Weinberg (Cell Vol. 100, 57-70, January, 2000) The

Hallmarks of Cancer

2 F, Jan. 21 Introduction to Cancer Pathology

Lecture 2: Powerpoint PDF

Reading: In Cancer Medicine, Chapter 29: Principles of Cancer Pathology, read the following sections:

° Principles of cancer pathology
° Solid tumor structure and tumor stroma generation
° Role of the surgical pathologist in the diagnosis and management of the patient
° Role of the cytopathologist
°Summary and Conclusions

WebPath Neoplasia Images: Neoplasia Index

Additional reading (not required):

Under the Microscope: doctors, lawyers, and melanocytic neoplasms pdf

Molecular Mechanism of Cancer Pain. Nature Reviews Cancer pdf

Can Dogs Smell Cancer? link

3 M, Jan. 24 Cancer Pathology, continued. We may start the next topic....

Lecture 3: Powerpoint PDF

Reading: Read the following sub-sections in Cancer Medicine: Invasion and Metastasis

- **Tumor-Host and Tumor-Stromal Interactions**
- **Adhesion**
- **Proteolysis**
- **Tumor Cell Migration**
- **Angiogenesis**
- **Metastasis as a Therapeutic Target**

Dissemination and growth of cancer cells in metastatic sites. Nature Reviews Cancer 2002.

4 W, Jan. 26: Tumor Invasion and Metastasis.

5 F, Jan. 28: Tumor Invasion and Metastasis, continued.

Sentinel lymph node mapping videos: 1 2 3

6 M, Jan. 31: Stem Cells and Cancer.

Lecture 4 (stem cells): Powerpoint PDF

Reading:

Stem cells, cancer, and cancer stem cells. Reya, et al. Nature Cancer Rev. 2001

Cancer Stem Cells Jordan, et al. New England Journal of Medicine, 2006

A human colon cancer cell capable of initiating tumor growth in immunodeficient mice O'Brien, et al. Nature, Jan. 4, 2007.

7 W, Feb. 2: Stem Cells and Cancer, continued.

8 F, Feb. 4: Carcinogens and Cancer Epidemiology

9 M, Feb. 7: Cancer Epidemiology, continued.

10 W., Feb. 9: Cancer Treatment and Pharmacology; Multidrug Resistance

11 F., Feb. 11: Cancer Treatment and Pharmacology; Multidrug Resistance, cont.

12 M, Feb. 14: The Discovery of Oncogenes

13 W., Feb. 16: Exam 1 - in class

14 F., Feb. 18: Discovery of Oncogenes, continued.

15 M., Feb. 21: Retroviruses and Cancer; HTLV-1, and Introduction to the Ubiquitin Proteolysis System

16 W., Feb. 23: ....continued

17 F., Feb. 25: Src - The Protein; Introduction to Receptor Tyrosine Kinases

18 M., Feb. 28: Polyoma Middle T and Receptor Tyrosine Kinases

19 W., Mar. 2: Oncogenic Receptor Tyrosine Kinases

20 F., Mar. 4: The Ras Oncoprotein

21 M., Mar. 7: Ras, continued.

22 W., Mar. 9: Tumor suppressors

23 F., Mar. 11: Tumor suppressors and introduction to Retinoblastoma

---------- Mar. 14-18 Spring Break ----------

24 M., Mar. 21: Rb, continued

25 W., Mar. 23: EXAM 2, in class

26 F., Apr. 25: Rb, continued.

27 M., Mar. 28: p53 part 1

28 W., Mar. 30: Human papillomaviruses and cervical cancer

29 F., Apr. 1: ....continued

30 M., Apr. 4: Apoptosis

31 W., Apr. 6: ....continued

32 F., Apr. 8:

33 M., Apr. 11: EXAM 3 - in class

34 W., Apr. 13: Immortality and telomeres

35 F., Apr. 15: ....continued

36 M., Apr. 18: Angiongenesis and von Hippel-Lindau disease

37 W., Apr. 20: Genetic Instability and DNA repair pathways in Cancer

38 F., Apr. 22: Genetic Instability and DNA repair pathways in Cancer

39 M., Apr. 25: Micro RNAs and cancer

40 W., Apr. 27: Molecular Profiling of tumors

41 F., Apr. 29: Molecular Profiling of tumors

42 M., May 2: Emerging topics

43 W., May 4: Emerging topics

44 F., May 6:

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