

**CANCER BIOLOGY**  
**BIOS 597    Fall 2003**

**Lecture Time:**        Tuesday & Thursday, 11:00 – 12.15 p.m.  
**Location:**            Room 1728 Wood Hall  
**Textbook:**            The Biological Basis of Cancer  
                               Robert McKinnell et al., Cambridge University Press, 1998.

**Instructor:**         Leonard Beuving, Ph.D.  
**Office:**                3173 Wood Hall  
                               372-4458 (Home Office)  
                               beuving@wmich.edu

**Office Hours:**      Tuesday & Thursday – 12:30 – 1:30 p.m.  
                               Other times by appointment

**Course Objective:**    To acquaint students with the biological principles of cancer as well as  
                                   the human dimensions of the disease and its therapies.

**Tentative Lecture Schedule**

<b>Date</b>	<b>Topic (x)</b>	<b>Text Chapters</b>
<b>Week 1</b>		
Tues, Sep 2	Introduction to course (1)	Preface & 1
Thurs, Sep 4	Clinical features & pathology of cancer (2)	1
<b>Week 2</b>		
Tues, Sep 9	Phenotypic characteristics of cancer cells (3)	1
Thurs, Sep 11	Phenotypic characteristics of cancer cells (3)	1
<b>Week 3</b>		
Tues, Sep 16	Role of differentiation and apoptosis (3)	2
Thurs, Sep 18	Biology of metastasis (4)	2
<b>Week 4</b>		
Tues, Sep 23	Biology of metastasis (4)	2
Thurs, Sep 25	Carcinogenesis – Chemical (5)	3
<b>Week 5</b>		
Tues, Sep 30	Carcinogenesis – Chemical (5)	3
Thurs, Oct 2	Carcinogenesis – Radiation (5)	3
<b>Week 6</b>		
Tues, Oct 7	<b>Exam 1</b>	3
Thurs, Oct 9	Carcinogenesis - Viral (6)	3
<b>Week 7</b>		
Tues, Oct 14	Cancer genetics (7)	4
Thurs, Oct 16	Oncogenes (8) <b>(Exam 1 corrections due)</b>	5
<b>Week 8</b>		
Tues, Oct 21	Growth factors and signal transduction (9)	5
Thurs, Oct 23	Cell cycle regulation and apoptosis (9)	5

<b>Date</b>	<b>Topic</b>	<b>Text Chapters</b>
<b>Week 9</b>		
Tues, Oct 28	Tumor suppressor genes (9)	5
Thurs, Oct 30	Continuation (9)	
<b>Week 10</b>		
Tues, Nov 4	<b>Exam 2</b>	
Thurs, Nov 6	Epidemiology (10)	7
<b>Week 11</b>		
Tues, Nov 11	Epidemiology with regards to life style (11)	7
Thurs, Nov 13	Host tumor interactions <b>(Exam 2 corrections due)</b>	
<b>Week 12</b>		
Tues, Nov 18	Principles of chemotherapy (12)	
Thurs, Nov 20	Mechanisms of cytotoxic drug action (13)	8
<b>Week 14</b>		
Tues, Nov 25	Continuation (13)	8
Thurs, Nov 27	<i>Thanksgiving Break</i>	
<b>Week 15</b>		
Tues, Dec 2	Review	
Thurs, Dec 5	<b>Exam 3</b>	
<b>Week 16</b>		
<b>Mon, Dec 8</b>	<b>Final Exam: 10:15 am - 12:15 1728 Wood Hall</b>	

### **Presentations for extra credit**

Most students may make a 10 minute oral presentation to the class using PowerPoint as a visual aid for 30 points. Topics not on the posted list, must be approved by Dr. Beuving at least 2 weeks before the time slot you have chosen. A list of suggested topics and their presentation dates will be posted outside of my office; sign up for your time and likely topic. Only one person may use a topic. An outline of the talk or printout of the PowerPoint slides must be distributed to the class. Some exam questions will be based on these presentations.

Alternatively, you can prepare a 15 slide PowerPoint presentation and submit a two slide per page printout for me. These will be worth 15 extra credit points. These topics must be approved by me and will be due by Tuesday November 25, 2003.

In each case the content of your presentation should include:

- A title slide
- A statement of the objective
- A description for the historical rationale behind the objective
- A description of the relevant basic cellular or organismal biology
- The methodological approaches used
- The findings or current understanding about the objective
- Your sources

**Exam Policies:**

1. Students will place all written materials and carrying containers against the walls; this includes all electronic communication devices, unless I give you specific written permission. You will sit in every other seat.
2. Exams will be multiple choice with some questions requiring written answers. Questions will be taken from lecture material, text and assigned supplementary materials, and student presentations.
3. You may keep your exam questions (I suggest you mark each of your answers). Your answers will be posted on the course's WEB site as soon as we can manage.
4. A grade of zero will be recorded for any exam not taken unless a note from a community caregiver corroborates the student's inability to take the exam. A make-up exam (different from the original) may be taken within 3 school days after the missed exam. Arrangements for this exception must be made within a day after the original exam.
5. In order to aid learning, the correct answer with explanation and specific source ( eg., Page 135 of McKinnell or Slide 7 of Lecture 5 ) to each missed question can be submitted by the date stated in the syllabus. One-half of the original credit will be awarded. This privilege will not be applied to make-up exams, the third midterm nor the final exam.

**Grading:**

Exams: There will be three (3) exams with objective questions, each worth 100 points, and a comprehensive final exam worth 150 points.

Extra Credit: Sources include Student Presentations worth up to 30 or 15 points depending on the type of presentation and my evaluation. In addition, one half credit will be awarded for each submitted corrected question on Exams 1 and 2. Your grade will be based on a percentage of accumulated total points relative to total exam points as indicated below:

Percentage of Total Points	Grade
100-92	A
91-87	BA
86-78	B
77-72	CB
71-66	C
65-57	DC
56-50	D
49 and below	E

**Class Policies:**

Attendance: Attendance is not required; however, exam questions will cover material presented in class that is not contained in the book or lecture notes.

Do not allow a cell phone to "ring". If you must answer, please leave the room.

### **Academic Ethics:**

You are responsible for making yourself aware of and understanding the policies and procedures in the Undergraduate (pp. 271 - 272) or Graduate (pp. 24-26) Catalogs that pertain to academic integrity. These policies include cheating, fabrication, falsification and forgery, multiple submission, plagiarism, complicity and computer misuse. If there is a reason to believe you have been involved in academic dishonesty, you will be referred to the Office of Student Judicial Affairs. You will be given the opportunity to review the charge(s). If you believe you are not responsible, you will have the opportunity for a hearing. You should consult with me if you are uncertain about an issue of academic honesty prior to submission of an exam or test.

### **Frequently Used Information Sources:**

1. Cooper, G. *The Cell, A Molecular Approach*. 2<sup>nd</sup> edition, ASM Press, 2000.
2. Ruddle, K. *Cancer Biology*. 3<sup>rd</sup> edition, Oxford University Press, 1995.
3. Alberts, et al. *Molecular Biology of the Cell*. 4<sup>th</sup> edition, Garland Press, 2002.
4. Kumar, R. et al. *Basic Pathology*. 6<sup>th</sup> edition, W.B. Saunders, 1997.

### **Useful Websites**

1. <http://homepages.wmich.edu/~beuving> User ID-cancerbiology; Password: chloeb
2. <http://www-medlib.med.utah.edu/WebPath/webpath.html>
3. <http://www.cancer.gov/> Seek; "cancer information"
4. <http://press2.nci.nih.gov/sciencebehind/> Using menu "Understanding", Read: Cancer, Angiogenesis, The Immune Response
5. <http://www.ncbi.nlm.nih.gov/query.fcgi>
6. <http://syllabus.syr.edu/BIO/tpfondy/bio501/>

**CANCER BIOLOGY Fall 3003**  
**Presentation Sign Up**

<b>Date</b>	<b>Topic Suggestion</b>	<b>Name e-mail</b>
9/16	<b>Do sunscreen lotions protect your skin from cancer risk?</b> Schroeder, S. Bench Marks 3(3) 2003	
9/18	<b>What are stem cells and how can they be used in cancer therapy?</b> <a href="http://stemcells.nih.gov/infocenter/">//stemcells.nih.gov/infocenter/</a>	
9/23	<b>Can inhibitors of the mortality enzyme "telomerase" suppress cancer growth?</b> Asai, A.: Cancer Res. July,2003; Reuters Health: 2003,7-16	
9/25	<b>Metastasis gene may be useful in diagnosis and treatment of liver cancer.;</b> <a href="http://www.cancer.gov/templates/--">//www.cancer.gov/templates/--</a> ; Ye Q: Nat Med 2003;9:416	
9/30	<b>Usefulness of PSA as a tumor marker.</b> <a href="http://bmj.com/cgi/content/full/320/7232/424">//bmj.com/cgi/content/full/320/7232/424</a>	
10/2	<b>Drugs that block extracellular matrix breakdown may inhibit angiogenesis:</b> Marimistat, AG3340, CO1-3, Neovostat	
10/7	<b>Exam 1</b>	
10/9	<b>Prostate cancer progression related to E-cadheren and metalloproteinase levels.</b> <a href="mailto:suss.men@mdanderson.org">/suss.men@mdanderson.org</a>	
10/14	<b>Gene expression profiles predict survival of lymphoma patients after chemotherapy.</b> <a href="http://www.cancer.gov/newscenter/geneexpression">//www.cancer.gov/newscenter/geneexpression</a> Rosenwald,A.:NEJM2002;346(25)1937-	
10/16	<b>Colon cancer gene SLC5A8 and others.</b> Markowitz,S. PNAS, July 2003; Velculescu,V. Science May 9,2003.	
10/21	<b>Signal transduction-targeting cancer at the molecular level;</b> Be focused for presentation. <a href="http://www.novartis oncology.com/utills/print/page/signaltransduction">//www.novartis oncology.com/utills/print/page/signaltransduction</a> Buchdunger,E. J.Pharmacol.Exp.Ther. 2000;295:139-145	
10/23	<b>Explain the relevance of the MYC oncogene to human cancer.</b> <a href="http://www3.ncbi.nlm.nih.gov/htbin-post/Omim/dispim?19008">//www3.ncbi.nlm.nih.gov/htbin-post/Omim/dispim?19008</a>	
10/28	<b>What is the p53 tumor suppressor gene and how can it be used to test for potential chemical carcinogens?</b>	
10/30	<b>Cyclin-dependent kinase modulator for the prevention and treatment of human neoplasms.</b> Sanderowicz, A.: Cancer Chemother Pharmacol. 2003(52)61-73---See Flavopiridol and UCN-01	
11/4	<b>Exam 2</b>	

<b>Date</b>	<b>Topic Suggestion</b>	<b>Name e-mail</b>
11/6	<b>What are cancer clinical trials and why are they needed?</b> <a href="http://www.cancerbacup.org.uk/reports/ct/ct10.htm">//www.cancerbacup.org.uk/reports/ct/ct10.htm</a>	
11/11	<b>Herceptin: How does it work?</b> <a href="http://www.breastcancer.org.uk/Breastcancer/Drugtherapy">//www.breastcancer.org.uk/Breastcancer/Drugtherapy</a>	
11/13	<b>Sources and impact of fatigue in cancer.</b> <a href="http://www.cancerbacup.org.wk/reports/fatigue-mac.htm">//www.cancerbacup.org.wk/reports/fatigue-mac.htm</a>	
11/18	<b>Cancer vaccines: Advances give hope in future therapy.</b> <a href="http://ccr.cancer.gov/news/press/JNCI_cancervaccines.asp">//ccr.cancer.gov/news/press/JNCI_cancervaccines.asp</a>	
11/20	<b>Estrogen receptors; tamoxifen and raloxifine.</b> See NCI <a href="http://sciencebehind/estrogen/estrogen01.htm">/sciencebehind/estrogen/estrogen01.htm</a>	
11/25	<b>Aromasin: New breast cancer therapy for post menopausal women.</b> <a href="http://www.breastcancer-can.org.uk/Breastcancer/DrugTherapy/A">//www.breastcancer-can.org.uk/Breastcancer/DrugTherapy/A</a>	
12/2	<b>Finasteride reduces prostate cancer risk---How?</b>	

#### **Other Topic Suggestions**

Is there a significant relationship between hormone replacement therapy and breast cancer?  
[//www.cancerbacup.org.uk/reports/breast-hormones-mac.htm](http://www.cancerbacup.org.uk/reports/breast-hormones-mac.htm)

Angiogenesis is required for successful metastasis. Furge, K.: PNAS 98(19) 10722;  
[//www.vai.org/vari/labs/webb.asp](http://www.vai.org/vari/labs/webb.asp)

Is there a relationship between SNPS and cancer? [/sciencebehind/snps\\_cancer/snps\\_cancer](http://sciencebehind/snps_cancer/snps_cancer)

Immuno control may cause shrinkage of melanoma. Phan, CQ., PNAS 2003 June 23 p2009. Dudley, M.: Science 2002; vol 298:850

Inhibition of COX-2 reduces the incidence of some cancers.

Vaccine may protect against cervical cancer

Overexpression of N-myc in neuroblastomas

Is cell transformation related to the interaction of the JAK/STAT signal transduction pathway with cyclin-CDK function? Chen; Drosophila Dev Cell 4: 179, 2003. [//ccr.nci.nih.gov/news/frontiers/July\\_2003.pdf](http://ccr.nci.nih.gov/news/frontiers/July_2003.pdf)