Cover Sheet: Request 12258

PCB3xxx Cancer Biology

Info

Process	Course|New|Ugrad/Pro
Status	Pending at PV - University Curriculum Committee (UCC)
Submitter	David Oppenheimer oppenhe@ufl.edu
Created	1/26/2018 3:41:21 PM
Updated	8/24/2018 2:52:45 PM
Description of request	An introduction to the molecular and cellular basis of cancer. This course will take a mechanistic view of the dysregulation of cellular processes that occurs in cancer cells, including the mechanisms of action of anti-cancer drugs.

Actions

Step	Status	Group	User	Comment	Updated
Department	Approved	CLAS - Biology 011690003	Marta Wayne		4/5/2018
No document changes					
College	Conditionall Approved	CLAS - College of Liberal Arts and Sciences	Joseph Spillane	This course is conditionally approved by the College Curriculum Committee, with the following minor changes requested: 1) Use the approved telegraphic style for the course description, found at http://clas.ufl.edu/curriculum/do 2) under course objectives, change "understand" to something measurable, like 'describe'; 3) correct the grading scale to eliminate the use of the = sign.	5/6/2018
No document changes					
Department	Approved	CLAS - Biology 011690003	Nicole Gerlach		7/31/2018
No document changes					
College	Approved	CLAS - College of Liberal Arts and Sciences	Joseph Spillane		8/24/2018
No document changes					
University Curriculum Committee	Pending	PV - University Curriculum Committee (UCC)			8/24/2018
No document changes					
Statewide Course Numbering System					
No document changes					
Office of the Registrar					
No document changes					
Student Academic Support System					

Step	Status	Group	User	Comment	Updated
No document changes					
Catalog					
No document changes					
College Notified					
No document changes					

Course|New for request 12258

Info

Request: PCB3xxx Cancer Biology
Description of request: An introduction to the molecular and cellular basis of cancer. This course will take a mechanistic view of the dysregulation of cellular processes that occurs in cancer cells, including the mechanisms of action of anti-cancer drugs.
Submitter: David Oppenheimer oppenhe@ufl.edu
Created: 7/31/2018 2:47:30 PM
Form version: 3

Responses

Recommended Prefix PCB
Course Level 3
Number xxx
Category of Instruction Intermediate
Lab Code None
Course Title Cancer Biology
Transcript Title Cancer Biology
Degree Type Baccalaureate

Delivery Method(s) On-Campus
Co-Listing No
Co-Listing Explanation N/A
Effective Term Earliest Available
Effective Year Earliest Available
Rotating Topic? No
Repeatable Credit? No

Amount of Credit 3

S/U Only? No
Contact Type Regularly Scheduled
Weekly Contact Hours 3
Course Description An introduction to the dysregulation of cellular processes in cancer cells including the mechanisms of action of anti-cancer drugs.
Prerequisites BSC 2010 (C) & BSC 2010L (C) & BSC 2011 (C) & BSC 2011L (C)

Co-requisites None
Rationale and Placement in Curriculum Rationale for offering the course: Cancer will affect 1 out of 3 of us during our lifetime. The course will take a mechanistic view of cancer focusing on the myriad cellular processes that are impaired in cancer cells. Biology majors (many of whom are on the pre-medical track) have requested more medically-related electives, and this course fulfills that request. In addition, there are no similar courses taught on campus.
Place in the curriculum: This course is an elective for all tracks in the Biology major, the Zoology major and the Botany major.
Course Objectives Students who successfully complete this course will be able to:

- Describe how biological macromolecules are assembled and function.
- Describe how macromolecules are assembled into higher order structures.
- Explain how lipids are assembled into biological membranes, and illustrate the key membrane trafficking pathways.
- Compare how membrane trafficking in cancer cells and normal cells.
- Critically evaluate the cytoskeleton regulation pathways that are exploited by cancer cells during metastasis.
- Explain how mutations in oncogenes and tumor suppressor genes enable unrestricted cell division.
- Outline the metabolic pathways that cancer cells exploit for rapid growth.
- Predict signaling pathways that could be targets for novel anti-cancer drug development.

- Critically evaluate cancer prevention and treatment strategies.
- Illustrate how cancer cells escape programmed cell death, and predict how synthetic lethality can be exploited to specifically target tumor cells.

Course Textbook(s) and/or Other Assigned Reading Course Textbook:
Title: Becker's World of the Cell (9e)
Authors: Jeff hardin and Gregory Bertoni

Other assigned reading:
Current journal articles and review articles will be assigned for particular topics. These are likely to change from year-to-year to keep the content as up to date as possible. Some specific examples include:

Baenke, F., B. Peck, H. Miess and A. Schulze. 2013. Hooked on fat: the role of lipid synthesis in cancer metabolism and tumour development. Dis Model Mech 6: 1353-1363.

Goldenring, J.R. 2013. A central role for vesicle trafficking in epithelial neoplasia: intracellular highways to carcinogenesis. Nat. Rev. Cancer 13: 813-820.

Lappano, R. and M. Maggiolini. 2011. G protein-coupled receptors: novel targets for drug discovery in cancer. Nat Rev Drug Discov 10: 47-60.

Mello, S.S. and L.D. Attardi. 2017. Deciphering p53 signaling in tumor suppression. Curr. Opin. Cell Biol. 51: 65-72.

Quintela-Fandino, M., E. Arpaia, D. Brenner, T. Goh, F.A. Yeung, H. Blaser, R. Alexandrova, E.F. Lind, M.W. Tusche, A. Wakeham, P.S. Ohashi and T.W. Mak. 2010. HUNK suppresses metastasis of basal type breast cancers by disrupting the interaction between PP2A and cofilin-1. Proc. Natl. Acad. Sci. U S A 107: 2622-2627.

Luengo, A., D.Y. Gui and M.G. Vander Heiden. 2017. Targeting Metabolism for Cancer Therapy. Cell Chem Biol 24: 1161-1180.

Nijman, S.M. and S.H. Friend. 2013. Cancer. Potential of the synthetic lethality principle. Science 342: 809-811.

Weekly Schedule of Topics Date Topic Chapter

		Course Introduction	
Mon 1/8	1	Introduction to the course	
Wed 1/10	2	Introduction to Cancer	26
Fri 1/12	3	Proteins structure and function	3
		Background — Macromolecules	
Mon 1/15		Holiday — no classes	
Wed 1/17	4	Lipids and cancer — lipid signaling	3
Fri 1/19	5	Lipids and cancer — lipid metabolism	Supplemental reading (Hooked on Fat)
Mon 1/22	6	Membrane components	7.1, 7.3-7.4
		Membrane trafficking in cancer	
Wed 1/24	7	Membrane trafficking	12.1-12.7
Fri 1/26	8	Dysregulated vesicle trafficking systems in cancer cells	12.1-12.7,Supplemental reading (highways to cancer)
Mon 1/29	9		
Wed 1/31	10	The Proteasome and cancer	20, 24, Supplemental reading
Fri 2/2	11	EXAM 1	
		Oncogenes and Cell Signaling	
Mon 2/5	12	G-protein coupled receptors in development of cancer and metastasis	23, 26
Wed 2/7	13	Calcium signaling in cancer metastasis	23, 26
Fri 2/9	14	Protein Kinase-Associated Receptors	23, 26, Supplemental reading
Mon 2/12	15	Activation of tyrosine kinases in cancer	23, 26, Supplemental reading
Wed 2/14	16	Hormone signaling in cancer	23, 26, Supplemental reading
		Tumor Suppressors and the Cell Cycle	
Fri 2/16	17	Overview of the Cell Cycle	24

Mon 2/19	18	The retinoblastoma gene and cell cycle regulation	24, 26, Supplemental reading
Wed 2/21	19	The DNA damage checkpoint	24, 26, Supplemental reading
Fri 2/23	20	p53 and DNA damage	24, 26, Supplemental reading
Mon 2/26	21	BRC1, BRC2 and DNA damage	24, 26, Supplemental reading
Wed 2/28	22	EXAM 2	
		Metastasis and the Cytoskeleton	
Fri 3/2	23	Overview of the cytoskeleton	13
Mon 3/5		SPRING BREAK	
Wed 3/7		SPRING BREAK	
Fri 3/9		SPRING BREAK	
Mon 3/12	24	Cytoskeletal regulatory proteins	13, 14
Wed 3/14	25	Cellular motility and metastasis	14, Supplemental reading
Fri 3/16	26	Intermediate filaments and metastasis	13, Supplemental reading
		Extracellular Matrix and the Tumor Microenvironment	
Mon 3/19	27	Overview of the ECM	15
Wed 3/21	28	Regulators of the tumor microenvironment	15, Supplemental reading
		Cellular Metabolism and the Warburg effect	
Fri 3/23	29	Cellular metabolic homeostasis	5, 9, 10
Mon 3/26	30	The Warburg effect	9, 10, Supplemental reading
Wed 3/28	31	Exploiting the Warburg effect for cancer diagnosis and treatment	Supplemental reading
Fri 3/30	32	EXAM 3	
		Apoptosis and Synthetic Lethality	
Mon 4/2	33	The cell death pathway	24
Wed 4/4	34	Synthetic lethality: inducing the apoptosis in cancer cells	Supplemental reading
		Cancer Prevention and Diagnosis	
Fri 4/6	35	Carcinogens and DNA damage	26, Supplemental reading
Mon 4/9	36	Epidemiology and Cancer	26, Supplemental reading
Wed 4/11	37	Genomic Screening	26, Supplemental reading
Fri 4/13	38	Infectious agents that cause cancer	26
		Cancer Treatment Strategies	
Mon 4/16	39	Cancer resistance to chemotherapy	26, Supplemental reading
Wed 4/18	40	Immunological suppression of cancer	Supplemental reading
Fri 4/20	41	Cancer Drug discovery	Supplemental reading
Mon 4/23	42	Review	
Wed 4/25	43	EXAM 4	

Links and Policies UF Grading Policy
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Attendance Policy
https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

Quiz make up policy:
There will be no make-up quizzes for any reason. The lowest 10 quiz grades will be dropped.

Exam make up policy:
No make up exams will be given without prior permission or documentation of illness. In case of illness, a note from your physician is required. A personal matter requires a note from the Dean of Students (http://www.dso.ufl.edu/, 202 Peabody Hall).

Exam Review policy:
Exams are available for review for only two weeks after the exam. You may not review previous exams, other than Exam 4, after the semester has ended.

Students Requiring Accommodations
Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as

possible in the semester.

Course Evaluation
Students are expected to provide feedback on the quality of instruction in this course by completing online evaluations at https://evaluations.ufl.edu. Evaluations are typically open during the last two or three weeks of the semester, but students will be given specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results/.

Class Demeanor
Students are expected to arrive to class on time and behave in a manner that is respectful to the instructor and to fellow students. Please avoid the use of cell phones and restrict eating to outside of the classroom. Opinions held by other students should be respected in discussion, and conversations that do not contribute to the discussion should be held at minimum, if at all.

Materials and Supplies Fees
There are no additional fees for this course.

University Honesty Policy
UF students are bound by The Honor Pledge which states, “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: “On my honor, I have neither given nor received unauthorized aid in doing this assignment.” The Honor Code (https://www.dso.ufl.edu/sccr/process/student-conduct- honor-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Counseling and Wellness Center
Contact information for the Counseling and Wellness Center:
http://www.counseling.ufl.edu/cwc/Default.aspx, 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.
Grading Scheme There will be 4 Exams during the semester. Exams are not cumulative. Exams will cover the material presented in lecture as well as any assigned supplemental reading or web-based material. Students will be responsible for assigned reading even if it is not specifically covered during the lecture period. The tests will contain multiple-choice questions, and written answer questions. No student will be allowed to start an exam after the first student to complete an exam leaves the classroom. All tests and answer sheets will be collected at the end of the exam period. No additional time will be given to complete an exam. (If you begin an exam late, then you will have less time to complete it.)

Quizzes will be given during lecture and will be counted as 10% of the course grade (see Student Response System, below). The quizzes will cover the material presented during the previous lecture and the assigned reading for the current lecture.

Course grades will be determined by the scores of the 4 exams plus the quiz scores and activities scores as follows: Each exam will be 20% of the total course grade (4 exams, 20% each to total 80%). The quiz scores will count as 10% of the course grade, and in-class activities will count for 10% of the course grade. 80% of the course grade will be exam scores, 10% of the course grade will be quiz scores, and 10% of the course grade will be the activities scores to total 100% of the course grade.

A curve for each exam will be calculated as follows: The top three scores on each exam will be averaged, and the difference between that value and the maximum possible value of 100 points will be determined. This curve point value will be added to each exam. At the end of the semester, letter grades will be assigned based upon the percentage of the curved exam grades that you have earned during the semester (plus the quiz scores), using the cut-offs in the table, below. These cut-offs may be lowered at the discretion of the instructor, but they will not be increased.

% of total course points

Letter Grade

at least 90.00

A
at least 86.66, but less than 90.00

A-
at least 83.33, but less than 86.66

B+
at least 80.00, but less than 83.33

B
at least 76.66, but less than 80.00

B-
at least 73.33, but less than 76.66

C+
at least 70.00, but less than 73.33

C
at least 66.66, but less than 70.00

C-
at least 63.33, but less than 66.66

D+
at least 60.00, but less than 63.33

D
at least 56.66, but less than 60.00

D-
less than 56.66

E

Instructor(s) David Oppenheimer