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MAR 10 2015
WSU Pullman

Washington State University
MAJOR CURRICULAR CHANGE FORM - - COURSE REVISION

- ☐ Please attach rationale for your request, a complete syllabus, and explain how this impacts other units in Pullman and other campuses (if applicable).
- ☐ Obtain all required signatures with dates.
- ☐ Provide original stapled packet of signed form/rationale statement/syllabus PLUS 10 stapled copies of complete packet to the Registrar's Office, campus mail code 1035.
- ☐ Submit one electronic copy of complete packet to wsu.curriculum@wsu.edu.

Requested Future Effective Date: Spring 2016 (term/year) Course Typically Offered: Spring

DEADLINES: For fall term effective date: **October 1st**; for spring or summer term effective date: **February 1st**. See instructions.

NOTE: Items received after deadlines may be put to the back of the line or forwarded to the following year. Please submit on time.

Current course [List course as it currently appears in the catalog]:

<u>MBioS</u>	<u>529</u>	<u>Selected Topics in Cell Biology</u>
course subject/crosslist	course no.	title
1 credit (<u> </u> - <u> </u>) Recommended Prep: MBioS 401 or an equivalent course providing a basic understanding of a typical eukaryotic cell.		
Credit hrs	lecture hrs per week	lab or studio hrs per week
		prerequisite

Requested Change(s): Check all that apply and list proposed change.

- ☐ Change subject: _____ ☐ Change course number: _____ ☐ Change credit to: _____
- ☐ Change lecture-lab ratio to: (-) ☒ Variable credit: 1-3 ☐ Repeat credit (cum. max. hrs): 3
- ☐ New/change crosslisting*: _____ ☐ Conjoint listing (400/500): _____
- Special Grading: ☐ S, F; ☐ A, S, F (PEACT only); ☐ S, M, F (VET MED only); ☐ H, S, F (PHARMACY, PHARDSCI only)
- ☐ Other (please list request): _____

NOTE: If only requesting a change to title, prerequisite, and/or description, please use a **Minor Curriculum Change** form.

- ☐ Title change: _____ ☐ Prerequisite change: _____
- ☐ Change catalog description to: V 1-3, May be repeated for credit; cumulative maximum 3 hours.

Selected topics in cell biology using current literature.

The following items require prior submission to other committees/depts. (SEE INSTRUCTIONS.)

- ☐ Request to meet Writing in the Major [M] requirement (Must have All-University Writing Committee Approval.)
- ☐ Request to meet UCORE in _____ (Must have UCORE Committee Approval >> See instructions.)
- ☐ Special Course Fee _____ (Must submit request to University Receivables)

Contact: <u>Kwan Hee Kim</u>	Phone number: <u>335-7022</u>	Campus mail code: <u>7520</u>
Email: <u>khkim@vetmed.wsu.edu</u>	Instructor, if different: <u>Kwan Hee Kim, Jonathan Jones</u>	

[Signature] MAR 9 2015
Chair/date

[Signature] 3-9-15
Dean/date

All-University Writing Com / date

Chair (if crosslisted/interdisciplinary)*

Dean (if crosslisted/interdisciplinary)*

UCORE Committee Approval Date

Catalog Subcommittee Approval Date

GSC or AAC Approval Date

Faculty Senate Approval Date

***If the proposed change impacts or involves collaboration with other units, use the additional signature lines provided for each impacted unit and college.**

Proposal to modify MBios 529 (Selected Topics in Cell Biology)

Rationale:

The SMB faculty has determined that it is advantageous to increase the flexibility of elective course offerings in the PhD in Molecular Biosciences degree program. Therefore, we will change MBios 529 from a strict 1 credit course to a variable 1-3 credit course. This change will make the course more accessible to graduate students in all CVM PhD programs and to students from other life science graduate programs at WSU. Students will be allowed to take the course for a maximum of 3 credits during their program of study. A sample syllabus for a 1 credit offering of the revised MBios 529 course is attached to this Major Curriculum Change form.

MBioS 529

Selected Topics in Cell Biology

1 Credit

Spring 2016

Instructors:

Kwan Hee Kim

BLS 345

Office Hours: by appointment

Phone: 5-7022

email: khkim@vetmed.wsu.edu

Jonathan Jones

BLS 202F

Office Hours: By appointment

Phone: 5-8724

Email: jcr.jones@vetmed.wsu.edu

Course meeting times and days: MWF 10:10-11:00 AM

Room: TBD

Description

Cell Biology is an area of scholarship that developed from the classical studies of histology and microscopic anatomy, beginning in the 18 th century. Recent advances in light microscopy analyses of live cells in vitro and in vivo have changed our concepts of how cells work and how the dynamics of their components contribute to cell and tissue phenotypes. This course will focus on the cytoskeleton components of cells, how they assemble and how they function in both development and disease.

Recommended Preparation: MBioS 401 or an equivalent course providing a basic understanding of the components of a typical eukaryotic cell.

Course Grading: Students are expected to read all notes and assigned papers and participate in class discussions. Grades will be based on the following assessments:

1. Participation -30 points. Class attendance is mandatory and students are expected to read all notes and assigned papers and be able to contribute to the class discussion of concepts and explain data in individual figures/tables and the authors' interpretations.
2. Immediate Feedback Quizzes – 30 points. Students are expected to study the notes and be able to participate in active learning classes.
3. Written and Oral presentations-40 points. Students will choose a paper from a topic list provided during the first week of class, write a brief News and Views type summary of it, and provide a brief oral presentation in class. Written and oral presentations (20 points each) will be assessed on the basis of clarity, appropriate coverage of the topic, and ability of the student to handle questions posed following the oral presentation.

Grading Overview:

Participation	30 pts
Immediate Feedback Quizzes	30 pts
Written Presentation	20 pts
Oral Presentation	20 pts
Total:	100 pts

Grade Distribution:

90-100 %	A
80-89%	B
70-79%	C
60-69%	D
<60%	F

Late Assignment Policy: It is expected that all assignments will be submitted in a timely fashion. Failure to do so will result in a 5-10pt reduction. Exceptions will, of course be made in the event of extenuating circumstances.

Learning objectives

At the end of this course students will be able to:

- a. Describe the basic features of a eukaryotic cell cytoskeleton.
- b. Demonstrate a working knowledge of state of the art microscopy techniques used to visualize live and fixed cells in vitro and in vivo.
- c. Understand how the cytoskeleton and its associated structures regulate cell structure and function in normal tissues and disease.

Learning Objective	How assessed
Describe the basic features of a eukaryotic cell cytoskeleton	In class discussion, Quizzes, presentations of assigned papers
Demonstrate a working knowledge of state of the art microscopy techniques used to visualize live and fixed cells in vitro and in vivo.	In class discussion, Quizzes, presentations of assigned papers
Possess a knowledge of how the cytoskeleton and its associated structures regulate cell structure and function in normal tissues and disease.	In class discussion, Quizzes, presentations of assigned papers

Assigned reading for class

1. <http://cellix.imba.oeaw.ac.at/cytoskeleton/filaments>
2. <http://www.rpi.edu/dept/bcbp/molbiochem/MBWeb/mb2/part1/actin.htm>
3. <http://www.rpi.edu/dept/bcbp/molbiochem/MBWeb/mb2/part1/microtub.htm>
4. <http://www.rpi.edu/dept/bcbp/molbiochem/MBWeb/mb2/part1/kinesin.htm>
5. http://en.wikipedia.org/wiki/Intermediate_filament

All students should read the above to remind themselves of the three cytoskeleton types, their composition, assembly mechanisms and the structure and functions of some of their associated proteins. The following are relatively recent reviews of the three cytoskeleton systems. There are many such reviews but these can be considered as a starting point and are written by leaders in their respective fields.

6. Stricker, J., Falzone, T. and Gardel ML. Mechanics of the F-actin cytoskeleton. J Biomech 2010 43:9–14.
7. Janke, C and Bulinski, J.C. Post-translational regulation of the microtubule cytoskeleton: mechanisms and functions. Nature Rev Mol Cell Biol 2011 12:773-786.
8. Herrmann, H., Strelkov, S.V., Peter Burkhard, P. and Ueli Aebi, U. Intermediate filaments: primary determinants of cell architecture and plasticity. J Clin Invest 2009 119:1772–1783.

Papers for student assignments

1. Legant et al. Multidimensional traction force microscopy reveals out-of-plane rotational moments about focal adhesions. PNAS 2013 110:881-886. [Contrast this with Lazarides, E. and Weber, K. Actin antibody: The specific visualization of actin filaments in non-muscle cells. PNAS 1974 71:2268-2272. The Lazarides paper is a classic - simple by our

- current standards but it opened up the era where antibodies are used to visualize a whole slew of cellular proteins].
2. Beaty et al. Talin regulates moesin-NHE-1 recruitment to invadopodia and promotes tumor metastasis. *J Cell Biol* 2014 205:737-751.
 3. Burnette et al. A contractile and counterbalancing adhesion system controls the 3D shape of crawling cells. *J Cell Biol* 2014 205:83-96.
 4. Uchimura et al. A flipped ion pair at the dynein-microtubule interface is critical for dynein motility and ATPase activation. *J Cell Biol* 2015 208:211-222.
 5. Lim et al. Opposing roles for JNK and Aurora A in regulating the association of WDR62 with spindle microtubules. *J Cell Sci* 2015 128:527-540.
 6. Kölsch et al. The keratin-filament cycle of assembly and disassembly. *J Cell Sci* 2010 123:2266-2272.
 7. Ho et al. Lamin A/C and emerin regulate MKL1-SRF activity by modulating actin dynamics. *Nature* 2013 497:507-511.
 8. Diguët et al. Muscle creatine kinase deficiency triggers both actin depolymerization and desmin disorganization by advanced glycation end products in dilated cardiomyopathy. *J Biol Chem* 2011 286:35007-35019.
 9. Konieczny et al. Myofiber integrity depends on desmin network targeting to Z-disks and costameres via distinct plectin isoforms. *J Cell Biol* 2008 181:667-681.
 10. Patel et al. Disease mutations in desmoplakin inhibit Cx43 membrane targeting mediated by desmoplakin-EB1 interactions *J Cell Biol* 2014 206:779-797.

Tentative Schedule of Studies

Cell Organization and Microscopy

- 1 – Welcome, course structure and expectations, introduction to cell organization
- 2 - Microscopy I
- 3 - Microscopy II

Cytoskeleton Composition and Structure I

- 4 – Cell cytoskeleton building blocks
- 5 – Muscle organization and contractility
- 6 – Actin associated proteins and lamellipodia, filopodia and the ARP2/3 complex

Cytoskeleton Composition and Structure II

- 7 – Focal adhesions, traction force generation and the regulation of directed migration
- 8 – Microtubules: Roles in motility and intracellular dynamics
- 9 - Intermediate filaments: Complex family of multifunctional proteins

Cytoskeleton and Disease

- 10 – Keratins and skin disease, desminopathies, neuronal intermediate filaments and diseases of the nervous system
- 11 – Laminopathies
- 12 - Muscular dystrophy

Presentation of student papers

- 13 - First 1/3 of students will present
- 14 - Second 1/3 of students will present
- 15 - Final 1/3 of students will present

Student Conduct Statement

Students are encouraged to work with classmates to understand the assigned papers and discussion materials. However, each student must independently demonstrate an understanding of the assigned material in class discussions. Students who violate WSU's Standards of Conduct for Students will receive an F as a final grade in this course, will not have the option to withdraw from the course and will be reported to the Office Student Standards and Accountability. Cheating is defined in the Standards for Student Conduct WAC 504-26-010 (3). It is strongly suggested that you read and understand these definitions.

Accommodation Policy

Reasonable accommodations are available for students with a documented disability. If you have a disability and may need accommodations to fully participate in this class, please visit the Access Center (Washington Building 217; 509-335-3417) to schedule an appointment with an Access Advisor. All accommodations **MUST** be approved through the Access Center. For more information, contact a Disability Specialist:

<http://accesscenter.wsu.edu>, Access.Center@wsu.edu

Safety Statement

Washington State University is committed to enhancing the safety of the students, faculty, staff, and visitors. It is highly recommended that you review the Campus Safety Plan (<http://safetyplan.wsu.edu/>) and visit the Office of Emergency Management web site (<http://oem.wsu.edu/>) for a comprehensive listing of university policies, procedures, statistics, and information related to campus safety, emergency management, and the health and welfare of the campus community.