Dear Dr. O'Palka and the Committee,

Please find enclosed a new course request for G825 Advanced Molecular Biology. We previously submitted a course change request for G865 Fundamental Molecular Biology. This request was not accepted by the committee and the present submission follows the advice of the committee to instead submit a new course.

As you know, we are introducing an open enrollment system, the Indiana University School of Medicine BioMedical Gateway (IBMG) program. IBMG students will join a common first-year community and will take a core first semester curriculum. In the second semester, students will choose modular courses to track towards their areas of interest. This course will be one of those modules. The curriculum will also include professional skills, career development, and ethics. First year students will have the freedom to choose laboratories from any Ph.D. program for 3 research rotations. At the end of the year, students will be able to join any of the Ph.D. programs. It has been the experience of other schools that this approach results in a happier community of graduate students and in a higher quality of student.

Further, the program will make graduate study at the IUSM better reflect the interdisciplinary nature of biomedical research. Incoming students will be able to focus on a research area, such as cancer, and will have the freedom to consider joining labs with different Ph.D. affiliations who work on those topics. It is also expected that the open enrollment system will promote research collaborations between IUSM laboratories because there will be an increased sense of community and an improved contact network within the graduate student population. In addition, the sharing of resources will allow the IUSM to strengthen its recruiting efforts with a goal of improving student numbers and quality. The system will improve the attractiveness of graduate study at the IUSM by offering students more choice and flexibility in their degree programs. In addition, an increased profile of the research and graduate programs of the school is consistent with the IUPUI goal to increase research output and the IU life sciences initiative.

The course will be open to students from other IUPUI graduate programs. A letters from the chair of the IUPUI Department of Biology stating that there is no conflict with their offerings is included.

Thank you for your consideration – please contact me if I can help with any questions.

Simon J. Rhodes, Ph.D.
Associate Dean for Graduate Studies
Indiana University School of Medicine
srhodes@iupui.edu
New Course Request

School/Division: Medicine/Graduate
School/Division: Medicine/Graduate

Course Number: G825
Course Number: G825

Course Title: Advanced Topics in Molecular Biology
Course Title: Advanced Topics in Molecular Biology

Recommended Abbreviation: Optional
Recommended Abbreviation: Optional

First time this course is to be offered (Semester/Year): Fall 2008
First time this course is to be offered (Semester/Year): Fall 2008

Credit Hours: Fixed at 2 or Variable from to
Credit Hours: Fixed at 4 or Variable from to

Is this course to be graded S-F (only)? Yes...
Is this course to be graded S-F (only)? Yes...

Is variable title approval being requested? Yes...
Is variable title approval being requested? Yes...

Course description (not to exceed 50 words) for Bulletin publication: The course will highlight selected topics adjusted each year to reflect the most current advancements in molecular biology and will include lectures and paper discussions on: Chromatin structure and regulation; Transcriptional control; RNA structure and processing; RNAi and miRNA; RNA decay; Translational control and its integration in gene expression.

Lecture Contact Hours: Fixed at 26 or Variable from to
Lecture Contact Hours: Fixed at 4 or Variable from to

Non-Lecture Contact Hours: Fixed at 4 or Variable from to
Non-Lecture Contact Hours: Fixed at 4 or Variable from to

Estimated enrollment: 100 of which percent are expected to be graduate students.
Estimated enrollment: 100 of which percent are expected to be graduate students.

Frequency of scheduling: Annually...Will this course be required for majors? No...
Frequency of scheduling: Annually...Will this course be required for majors? No...

Justification for new course: Elective module in new open-enrollment PhD program
Justification for new course: Elective module in new open-enrollment PhD program

Are the necessary reading materials currently available in the appropriate library? Yes...
Are the necessary reading materials currently available in the appropriate library? Yes...

Please append a complete outline of the proposed course, and indicate instructor (if known), textbooks, and other materials.
Please append a complete outline of the proposed course, and indicate instructor (if known), textbooks, and other materials.

If this course overlaps with existing courses, please explain with which courses it overlaps and whether this overlap is necessary, desirable, or unimportant.
If this course overlaps with existing courses, please explain with which courses it overlaps and whether this overlap is necessary, desirable, or unimportant.

A copy of every new course proposal must be submitted to departments, schools, or divisions in which there may be overlap of the new course with existing courses or areas of strong concern, with instructions that they send comments directly to the originating Curriculum Committee. Please append a list of departments, schools, or divisions thus consulted.

Submitted by:
Approved by:

[Signature] Date 10/10/07
[Signature] Date 10/15/07

Department Chairman/Division Director
Dean

[Signature] Date
[Signature] Date

Dean of Graduate School (when required)
Chancellor/Vice-President

[Signature] Date
[Signature] Date

University Registrar
University Registrar

After School/Division approval, forward the last copy (without attachments) to the University Registrar for initial processing, and the remaining four copies and attachments to the Campus Chancellor or Vice-President.
New Course Request

I. TITLE: ADVANCED TOPICS IN MOLECULAR BIOLOGY FALL, 2008

Course number: G825
Course directors: Anna DePaoli-Roach and Suk-Hee Lee
Instructors: Anna DePaoli-Roach, Suk-Hee Lee, Yuichiro Takagi and Jeremy Sanford.
Prerequisites: Successful completion of the Biomed I, II, and III courses or permission of instructor

II. COURSE DESCRIPTION AND RATIONALE:

This two credit hour course is designed to provide the most current advancement in molecular biology. The course is intended for IBMG students entering into the second year and will cover selected topics in molecular biology each year. The topics will reflect the most up-to-date advancements in chromatin structure and regulation, DNA replication and repair, transcriptional control, RNA structure and processing, and RNAi and miRNA, RNA decay, and translational control and its integration in gene expression. Class will meet once a week. Each session will consist of one-hour lecture followed by an hour discussion of recent papers relevant to the lecture topic. Student will read, present and discuss original and review articles relevant to classes. The course will be delivered using a computer-directed PowerPoint or overhead presentation.

One line description: The course will provide the most current advancements in selected topics of molecular biology with emphasis on DNA replication and gene expression in health and disease. In addition to formal lectures, research papers will be discussed in the class.

III. EDUCATIONAL OBJECTIVES:
- Understand how chromatin structure is regulated
- Understand how chromatin modification(s) is involved in functional regulation
- Understand cell-cycle and damage-induced regulation of DNA replication in eukaryotes
- Understand the role of DNA damage and its repair in cancer and aging in eukaryotes
- Understand how chromatin dynamics play a role in active promoters in eukaryotes
- Understand overall structure of RNA polymerase II
- Understand the structural basis for fidelity of transcription by RNA polymerase II: mechanism of nucleotide selection and role of transcription factors.
- Understand the structure of Mediator of transcription regulation and its implication to regulatory mechanisms
- Understand structure and function of catalytic RNA molecules
- Understand molecular mechanisms of pre-mRNA processing reactions
- Understand how alternative pre-mRNA splicing contributes to proteome diversity and regulation of gene expression
- Understand the biogenesis of small interfering RNA (siRNA) molecules
- Understand the mechanisms of siRNA action
- Know the mechanism of protein synthesis
- Understand the role of protein synthesis in the overall scheme of gene expression
- Understand mechanisms of control of protein synthesis and their involvement in disease states such as viral infection, stress, diabetes and cancer.
IV. COURSE CONTENT:

Class will meet once a week. Each session will be 2 hrs, one hour lecture and one hour paper discussion.

Chromatin structure and regulation (2 sessions):
- Basic chromatin structure in mammals
- Assembly of chromatin structure
- Chromatin modification(s)
- Functional regulation

DNA replication (2 sessions):
- Cell cycle regulation
- Damage-induced regulation

DNA repair (1 session)
- DNA Damage and its repair in cancer
- DNA Damage and aging in eukaryotes

Chromatin dynamics and gene regulation (1 session):
- How nucleosomes are removed and assembled in an activated promoter

Structural basis of transcription regulation in eukaryotes (1 session):
- Structure of eukaryotic RNA polymerase II
- Structure of RNA polymerase II and general transcription factors
- Structure of Mediator of transcription regulation

Exam 1

Structure and function of RNA (1 session):
- The RNA world: origins, confirmations and functions of catalytic and structural RNA
- Ribozymes
- Structural RNA
- Riboswitches

Pre-mRNA processing (1 session):
- Nuclear pre-mRNA processing
- RNA trafficking and localization
- Coupling of nuclear RNA processing events
  - Alternative pre-mRNA splicing (AS)
  - Types of AS events and molecular mechanisms
  - Genomic approaches
  - Proteomic impact of AS

siRNA biogenesis and function (1 session):
- siRNA diversity
- siRNA biogenesis: Processing factors and cell biology
- RISC taking: the mechanism(s) of siRNA action
Mechanism of protein synthesis in Prokaryotes and Eukaryotes (1 session)
- role of protein factors
- structure and function of tRNA
- structure and function of the ribosome
- mechanisms of initiation, elongation and termination, selection of start site, molecular mimicry

Control of protein synthesis I (1 session):
- RNA structure and stability
- Mechanisms of mRNA surveillance and implications in genetic diseases: nonsense-mediated mRNA decay, nonstop mRNA decay, and no-go mRNA decay

Control of protein synthesis II (1 session):
- viral infections
- stress responses
- nutrients
- extracellular signaling
- cancer
- diabetes

Exam 2

V. RECOMMENDED TEXTS:
VI. EVALUATION AND GRADING:

Student grades in the course will be determined by two examinations, each covering approximately one-half of the material with no comprehensive final. Students will also be evaluated on class presentations and discussion for 10% of final grade. Exam will be a combination of short answer/fill in the blank questions and short essay questions. Each exam will contribute 45% of the final grade. Objectives covered in the lectures will be the source of all examination questions.

Grading Scale:

<table>
<thead>
<tr>
<th>Letter grade</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>93-100</td>
</tr>
<tr>
<td>A-</td>
<td>90-92.99</td>
</tr>
<tr>
<td>B+</td>
<td>87-89.99</td>
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<tr>
<td>B</td>
<td>75-86.99</td>
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<tr>
<td>C</td>
<td>60-74.99</td>
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<tr>
<td>D</td>
<td>50-59.99</td>
</tr>
<tr>
<td>F</td>
<td>&lt;50</td>
</tr>
</tbody>
</table>

Note that grades of C and lower are not passing grades in graduate level courses.

VII. BIBLIOGRAPHY:

Representative sample of the selected readings related to the course:


VIII. CHEATING AND PLAGIARISM:

Students are instructed to make themselves aware of University regulations concerning plagiarism, the maintenance of academic honesty and the definitions of unacceptable behavior and cheating. Academic misconduct of any sort will not be tolerated and will be dealt with as outlined in the IU/IUPUI Code of Student Rights, Responsibilities, and Conduct, which can be viewed at:

http://www.life.iupui.edu/help/docs/Part_3all.html

Examples of misconduct include but are not limited to:
1. Cheating
   A student must not use or attempt to use unauthorized assistance, materials, information, or study aids in any academic exercise
2. Fabrication
   A student must not falsify or invent any information or data in an academic exercise including, but not limited to, records or reports, laboratory results, and citations to the sources of information.
3. Plagiarism
   A student must not adopt or reproduce ideas, words, or statements of another person without appropriate acknowledgment. A student must give credit to the
originality of others and acknowledge an indebtedness whenever he or she does any of the following:
a. Quotes another person's actual words, either oral or written
b. Paraphrases another person's words, either oral or written
c. Uses another person's idea, opinion, or theory; or
d. Borrows facts, statistics, or other illustrative material, unless the information is common knowledge.

4. Interference
   a. A student must not steal, change, destroy, or impede another student's work.
   b. A student must not give or offer a bribe, promise favors, or make threats with the intention of affecting a grade or the evaluation of academic performance.

Potential consequences for academic misconduct:

If the instructor has information that one of his/her students committed an act of academic misconduct, the faculty member will hold an informal conference with the student. The conference will be prompt and private. If the faculty member concludes that the student is responsible for the misconduct, then the faculty member will impose an appropriate academic sanction (i.e., lower or failing grade on the assignment, assessing a lower or failing grade for the course).

IX. AMERICANS WITH DISABILITIES ACT:

If you need any special accommodations due to a disability, please contact Adaptive Educational Services at (317)-274-3241. The office is located in CA 001E.
Simon,

I have had Dring look at this also and we find, based on content and the way this course is structured, no significant overlap with anything in Biology.

Doug