Course Syllabus
CBS 810-012 Fundamentals of Comparative Molecular Medicine
Fall, 2019

Course Directors: Ke Cheng & Jorge Piedrahita

Time: Class will be on 10:00 to 11:30 AM every Mon and Wed.
Aug 21st to Dec 4th, 2019
Address: CVM Research Building R101

Student Learning Objectives:
This course is designed to facilitate the students' ability to gain a broad understanding of Comparative Molecular Medicine and the interplay between clinical and basic research. Through this course, students will gain:

- An understanding of the role of interdisciplinary (TEAM) clinical research
- Pathophysiological basis of disease
- Development of therapeutics strategies
- Regulatory aspects of drug/therapeutic development
- Interplay between physics, chemistry, engineering and biology and its clinical/translational applications

Course Overview:

A. Goals. This is a 3 credit, graduate level course designed for incoming graduate students and advanced undergraduate students interested in gaining a broad understanding of: translational/clinical research, interdisciplinary research related to molecular medicine, basic principles of genetics, cell biology and engineering and how they are applied to the study/treatment of disease. The importance of large animal models to facilitate clinical translation to humans will also be covered. Course instructors include both basics scientists with active research programs as well as clinicians (MD and DVM).

B. Written Review (25%). A written report is worth 25% of your final grade. This assignment can be considered a "mini-review article". Each student will submit a written Review based on a topic suggested by an instructor (details will be discussed in class). The Research Proposal should be 1500-2500 words, cite current literature and include figures and tables as needed. Incorrect spelling, grammar and punctuation can influence this grade.

PLAGIARISM WILL NOT BE TOLERATED – MAKE SURE YOU UNDERSTAND THE DEFINITION OF PLAGIARISM. The University policy on academic integrity can be found in the Code of Student Conduct (found at http://policies.ncsu.edu/policy/pol-11-35-01). We expect students to complete this assignment on an individual basis. In addition, plagiarism (quoting authority as your own without referencing a citation or source) will not be tolerated in the preparation of this assignment.

C. Exams (75%). There will be 3 exams. Each exam is worth 25% of your final grade.

D. Grades:
Assignment of grades will be on the following basis:

A+ : 97.00 - 100.00%	B+ : 87.00 - 89.99%	C+ : 77.00 - 79.99%	D+: 67.00 - 69.99%
A : 93.00 - 96.99%	B : 83.00 - 86.99%	C : 73.00 - 76.99%	D : 63.00 - 66.99%
A- : 90.00 - 92.99%	B- : 80.00 - 82.99%	C- : 70.00 - 72.99%	D- : 60.00 - 62.99%
			F: Below 60%

Grades can be accessed via the course web page (https://wolfware.ncsu.edu/).

E. Attendance: Class attendance is mandatory. Students who miss a class for any reason, are responsible to get notes from another student. Students who anticipate the necessity of being absent from class due to the observation of a major religious observance must provide notice of the dates to the Course Director, in writing, by the second class meeting. Please see http://policies.ncsu.edu/regulation/reg-02-20-03 for additional details about university policies on attendance.

F. Disabilities. Reasonable accommodations will be made for students with recognized disabilities. Students with disabilities are invited to schedule an appointment (by the second class meeting) with the course director to discuss appropriate accommodations. In order to take advantage of available accommodations, students must register with Disabilities Services Office (DSO): 919-515-7653 (voice), 919-515-8830 (TTY), or http://dso.dasa.ncsu.edu/. For more information about NC State's policy on working with students with disabilities, please see: http://policies.ncsu.edu/regulation/reg-02-20-01.

G. Cell Phones: Please turn off all cell phones, beepers, pagers etc. during class.

H. Participating Faculty: This course will be team taught by faculty in the CBS/BME and CBE and related Programs. See course schedule for details.

Course Evaluations: Online class evaluations will be available for students to complete during the last two weeks of fall and become unavailable before finals begin.

Students will receive an email message directing them to a website where they can login using their Unity ID and complete evaluations. All evaluations are confidential; instructors will not know how any one student responded to any question, and students will not know the ratings for any instructors.

Evaluation website: http://go.ncsu.edu/cesurvey
Student help desk: classeval@ncsu.edu
More information about ClassEval: http://oirp.ncsu.edu/surveys/classeval

I. **Supporting Fellow Students in Distress:** As members of the NC State Wolfpack community, we each share a personal responsibility to express concern for one another and to ensure that this classroom and the campus as a whole remains a safe environment for learning. Occasionally, you may come across a fellow classmate whose personal behavior concerns or worries you. When this is the case, I would encourage you to report this behavior to the NC State Students of Concern website: http://studentsofconcern.ncsu.edu/. Although you can report anonymously, it is preferred that you share your contact information so they can follow-up with you personally.

Course Schedule --- Fall 2019

Class	Day	Date (2019)	Subject	Lecturer
1	Wed	Aug-21	Comparative Molecular Medicine – Introduction to course	Piedrahita (CVM)
2	Mon	Aug-26	Molecular Medicine Case studies – Musculoskeletal disease	Fisher et al (COE)
3	Wed	Aug-28	Molecular Medicine Case studies – Cardiac diseases	Meurs, MD (CVM
	Mon	Sep-2	NO CLASS --LABOR DAY	
4	Wed	Sep-4	Molecular Medicine Case studies – Gastro intestinal disease	Blisklager et al (CVM)
5	Mon	Sep-9	Molecular Medicine Case studies – Neurological disease	Olby (CVM)
6	Wed	Sep-11	Clinical Trials. Introduction and FDA regulations	Cheng/Lascelles (CVM)
7	Mon	Sep-16	Clinical Trials. GMP	Cheng (CVM)
7	Mon	Sep-16	Clinical Trials. When and how to translate	Duncan Lascelles (CVM)
8	Wed	Sep-18	Comparative Oncology	Matthew Breen (CVM)
9	Mon	Sep-23	EXAM 1	
10	Wed	Sep-25	Epigenetic basis of disease	Albert Keung (COE)
11	Mon	Sep-30	Systems Biology. From basic observation to clinical applications (TBD)	Adriana San Miguel (COE)
12	Wed	Oct-2	Mechanobiology/ Biomechanics and disease	Matt Fisher (COE)
13	Mon	Oct-7	Structural Biology protein aggregation and Alzheimer's disease	Carol Hall (COE)
14	Wed	Oct-9	Regenerative Medicine/Stem Cell Biology Part I	Ke Cheng (CVM)
15	Mon	Oct-14	Regenerative Medicine/ Scale up issues. Part II.	Binil Starly (COE)
16	Wed	Oct-16	Biomaterials/ Cell biology	Ashley Brown (COE)
17	Mon	Oct-21	Bioinformatics. OMICS and disease	XinXia Peng (CVM)
18	Wed	Oct-23	Biology of pain and itch	Santosh (CVM)
19	Mon	Oct-28	EXAM 2	
20	Wed	Oct-30	Mechanisms of pain. Clinical.	Lascelles (CVM)
21	Mon	Nov-4	Medicinal Chemistry and Drug Discovery	Josh Pierce (COS)
22	Wed	Nov-6	Synthetic Biology applied to Drug Development	Gavin Williams (COS)
23	Mon	Nov-11	Modulation of the Immune System. Immunoteraphy	David Zaharoff (COE)
24	Wed	Nov-13	Telomeres and Disease	Hong Wang (COS)
25	Mon	Nov-18	Neurons and Disease.	Troy Ghashghaei (CVM)
26	Wed	Nov-20	CRISPR Clinical Applications	Piedrahita (CVM)
27	Mon	Nov-25	Gene therapy. Viral Vectors	Asokan-Duke
	Wed	Nov-27	NO CLASS –THANKSGIVING	
	Mon	Dec-2	NO CLASS	
28	Wed	Dec-4	EXAM 3	