CAMB 6970: Biology of Stem Cells
Course Directors: Maria Basil and Andrew Modzelewski
Link to Canvas Site: CAMB 6970

Syllabus Spring 2025:

Class meets Mondays at 1:45PM to 3:45PM in BRB 253. Offered Spring Semester. Limited to 14 students. Exceptions will be made for Spring 2025 only.

Format: Class alternates between lectures from faculty and journal club presentations led by students. Some classes will include brief summaries (<5min) of Institute for Regenerative Medicine (IRM) lectures by the students. Each student will also be responsible for written assignments described below in the "grading" section.

Date	Speaker	Day	Class Type	Topic
Jan 22	IRM Annual Retreat		Symposium	**Optional and Encouraged**
Jan 27	First class	MON		Organizational
Feb 3	Gadue	MON	Lecture	iPS Cells
Feb 10*	Gadue	MON	JC	iPS Cells
Feb 17*	Anguera	MON	Lecture	Epigenetics and X-inactivation
Feb 24	Anguera	MON	JC	Epigenetics and X-inactivation
March 3	Vaughan	MON	Lecture	Lung and cell transplant
March 10	Spring Break	-	FUN	**Enjoy**!
March 12	IRM 4th Annual Brinster	WED	Symposium	**Optional and Encouraged**
March 17	Vaughan	MON	JC	Lung and cell transplant
March 24	Tong	MON	Lecture	Hematopoeisis
March 31*	Tong	MON	JC	Hematopoeisis
April 7*	Rompolas	MON	Lecture	Skin and Eye
April 14*	Rompolas	MON	JC	Skin and Eye
April 21*	Lengner	MON	Lecture	Organoids and Intestine
April 28	Lengner	MON	JC	Organoids and Intestine

Description: The goal of this course is to introduce graduate students to the field of stem cell biology through lectures and reviews of important contributions from the primary literature. Topics include embryonic stem cells, epigenetics and reprogramming, tissue-specific stem cells such as hematopoietic, neuronal, and epithelial stem cells, and model systems such as iPS cells and primary organoids. The potential applications and current challenges in stem cell and regeneration biology will be discussed. Important aspects of stem cell identification and characterization utilizing multiple model systems will be a focus.

Grading: Course grades will be assigned based on contribution to each of the following components, with weights as indicated below

-Journal Club Presentation (presentation by 2+ students per session of a manuscript(s) chosen by the lecturer and the course directors, each student presents once per semester, 35%)

-Submit 1-2 questions prior to each week's JC on Canvas (that session presenters exempt, 5 submissions, 10%)
-"News and Views" of one JC paper (1 per student, must be a paper from a different session than the JC presentation, 1000 words and 1-2 figures, 35%)
-Synopsis of IRM Lecture (Send 1-2 paragraphs before class on Canvas, <5min presentation at the start of assigned class, see description below, 10%)
-Active participation in class (10%)

***Institute for Regenerative Medicine (IRM) lecture series**: To facilitate and engage students with the broader Penn community, we have collaborated with the IRM lecture series (Distinguished Seminar Series, DSS and Stem Cell Club, SCC).
Each student will be required to attend at least one seminar, write a short (1-2 paragraph summary) on what they learned and what they see as the next steps of the research presented. The student will subsequently give a <5 minute oral synopsis to the class. The synopsis should focus (>80%) on how the findings relate to stem cell biology or regenerative medicine and what are possible future directions that are of interest to the student.

DATE	Talk Type	Speaker	Presenation date	Class Type
Feb 3	DSS	Karen Christman	Feb 10	JC
Feb 12	SCC	Sujatha Jagannathan	Feb 17	Lecture
March 24	DSS	Stephen Duncan	March 31	JC
March 26	SCC	Yun Li	April 7	Lecture
April 7	DSS	Tony Oro	April 14	JC
April 9	CSS	Vibhu Sahni	April 21	Lecture

Links to faculty websites: (Brief description of research)
Karen Christman: Novel biomaterials for tissue engineering, regenerative medicine, and drug delivery applications.
Sajutha Jagannath: How cells detect and degrade aberrant RNAs, and how dysregulation of this surveillance process contributes to human muscle development and disease.
Stephen Duncan: Liver development and disease using mice and induced pluripotent stem cells (iPSCs) as model systems.
Yun Li: Neurodevelopment, disorders like Autism and Epilepsy, Neural regeneration.
Tony Oro: Stem Cells, Tumor Evolution, and Novel Cellular and Molecular Therapeutics in hair and skin.
Bihu Sahni: Cell Fate Specification and Circuit Development