

MCDB 5615 Biology of Stem Cells Syllabus, Fall 2019

Instructor: Rui Yi, rui.yi@colorado.edu

Classes: Gold A120, Tuesdays and Thursdays, 11 am -12:15 pm

Biology of Stem Cells Course Syllabus MCDB 5615

Date	Topic	Reading	Group
8/27/19	Introduction: Cell Biology Review of Important Concepts/Tools	Lecture	Prof. Yi
8/29/19	Cell and Developmental Biology Review	Lecture	Prof. Yi
9/3/19	General Review of Stem Cell Biology	Lecture	Prof. Yi
9/5/19	Mouse Knockout Technology	Review (1)	Group 1
9/10/19	The Embryonic Stem Cell/Gene Targeting in the Mouse	Manuscript (2, 3)	Group 1
9/12/19	Genome editing	Review (4)	Group 2
9/17/19	Apply genome editing to stem cells	Manuscript (5, 6)	Group 2
9/19/19	ES Cells Without the ES	Review (7)	Group 3
9/24/19	iPS Cell ES Cells without the Embryo	Manuscript (8, 9)	Group 3
9/26/19	Guest lecture: Director of Stem Cell Research and Technology Resource Center		Teisha Rowland
10/1/19	Manipulate mammalian genome for stem cell biology	Lecture/Review (10, 11)	Prof. Yi
10/3/19	Invertebrate Regeneration	Review (12)	Group 4
10/8/19	Planarian Stem Cells	Manuscript (13)	Group 4
10/10/19	Mid-term		
10/15/19	An Introduction to the Stem Cell Niche	Review (14)	Group 5
10/17/19	Germ Line Stem Cells in Drosophila	Manuscript (15)	Group 5
10/22/19	Adult Tissue Stem Cell	Review (16)	Group 6

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Date	Topic	Reading	Group
10/24/19	Muscle Stem Cell	Manuscript (17)	Group 6
10/29/19	Hematopoietic Stem Cell	Review (18)	Group 7
10/31/19	Self-Renewal of HSCs	Manuscript (19, 20)	Group 7
11/5/19	Epithelial stem cells	Review (21)	Group 8
11/7/19	Skin stem cells	Manuscript (22, 23)	Group 8
11/12/19	Ageing and Stem Cells: A Connection?	Manuscript (24)	Group 9
11/14/19	Stem Cell Aging	Manuscript (25, 26)	Group 9
11/19/19	The Cancer Stem Cell Theory	Review (27)	Group 10
11/21/19	Stem Cell Cancers?	Manuscript (28)	Group 10
12/3/19	Tissue in the dish (Organoid)	Review (29)	Group 11
12/5/19	Tissue in the dish (Organoid)	Manuscript (30, 31)	Group 11
12/10/19	Review of Stem Cell Biology – Are we there yet?	Lecture	Prof. Yi
12/12/19	TBD		

1. M R. Capecchi, Gene targeting in mice: functional analysis of the mammalian genome for the twenty-first century. *Nat Rev Genet.* **6**, 507–512 (2005).
2. S. L. Mansour, K. R. Thomas, M. R. Capecchi, Disruption of the proto-oncogene int-2 in mouse embryo-derived stem cells: a general strategy for targeting mutations to non-selectable genes. *Nature.* **336**, 348–352 (1988).
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6. H. Ma, N. Marti-Gutierrez, S.-W. Park, J. Wu, Y. Lee, K. Suzuki, A. Koski, D. Ji, T. Hayama, R. Ahmed, H. Darby, C. Van Dyken, Y. Li, E. Kang, A.-R. Park, D. Kim, S.-T. Kim, J. Gong, Y. Gu, X. Xu, D. Battaglia, S. A. Krieg, D. M. Lee, D. H. Wu, D. P. Wolf, S. B. Heitner, J. C. I. Belmonte, P. Amato, J.-S. Kim, S. Kaul, S. Mitalipov, Correction of a pathogenic gene mutation in human embryos. *Nature.* **548**, 413–419 (2017).
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12. A. Sánchez Alvarado, Planarian Regeneration: Its End Is Its Beginning. *Cell*. **124**, 241–245 (2006).
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14. D. T. Scadden, The stem-cell niche as an entity of action. *Nature*. **441**, 1075–1079 (2006).
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