

LSCI 2060 Stem Cells and Social Justice Spring 2012 4.20

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“We are not students of some subject matter, but students of problems. And problems may cut right across the borders of any subject matter or discipline

--”(Popper, K. R. Conjectures and Refutations: The Growth of Scientific Knowledge. New York: Routledge and Kegan Paul, 1963, p. 88. 1963).

Course Description:

Though news stories highlight the societal implications of scientific advances, they sometimes skim over the basic science or take it out of context while college biology textbooks rarely explore the dynamic interplay between science and society. Not surprisingly, most students today acquire a vast sum of information but may not know how to piece it altogether; I hope this course will rectify this problem and demonstrate the ways that stem cell research is part of everyday life.

Here we will use a spiraling approach to teaching stem cell biology in a social context; the same topic will be revisited at different points in the course to allow for an unraveling of the complexity over time and space. Using an interdisciplinary approach we will integrate the biological, ethical, legal, and social dimensions of embryonic stem cell research and more specifically use critical perspectives from disability rights, feminist thought, religion, and social justice. Periodically, you will be asked to apply what you have learned using real world **case studies** that address challenges at the state, national, and international level so that you can make connections between what you learn in the classroom and what is portrayed in everyday life. Because the curriculum is part of an educational initiative funded by NYSTEM (The New York State Empire Fund for Stem Cell Research), I encourage you to view NYSTEM activities by attending, or viewing, The Ethics Committee and/or the Funding Committee meeting or other local events designed to highlight stem cell research. At the culmination of this course, there will be a capstone activity involving decision-making based on recent current events.

Part of your work will revolve around a self-designed project that informs the public about a stem cell or a stem cell related phenomenon. The project can be based on one of the outside events associated with the course, and take the shape of a newspaper column, web site, a blog entry, radio show, student chapter for stem cell research, advertising campaign, book review, info graphic, or educational workshop. It may also be a creative work coupled with an artist’s statement about the design process. We will be viewing artwork by scholars and alumni of the ArtSci movement (Hela Covert; Haseltine; PS; Epigenetics Dance; Frankel; Briganti’).

Learning Outcomes

1. Differentiate the various methods of developing stem cell lines and the implications for research, ethics, and therapy. (biology, ethics, scientific method, disease and therapy)
2. Categorize and summarize evidence-based arguments for and against the liberalization of hESC and the ways in which policy has been shaped by these competing positions. (policy & advocacy)
3. Recognize the dominant narrative in which scientific research is positioned as progress and question the benefits and dangers associated with SCR as compared to other approaches used to promote social good. (values, feminist approaches, disability rights)
4. Recognize and correct basic errors in representations of the scientific, ethical, and social dimensions of stem cell research (communication)
5. Trace the history of: cell research; human subjects research; the forms of compensation to balance the risks and benefits of research participation; and the formation of new regulatory structures designed to provide oversight of emerging practices.(history, policy)

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Semester at a Glance:

The context and all assignments are not visible in this one-page overview

Full syllabus with context on page 5.

Jan 24	Stem Cell Research: Promise, Problems, and Potential
Jan 26	Science the Endless Frontier?
Feb 29-2	Film Screening of Eggsploitation by Jennifer Lahl Soho Gallery for Digital Arts
Jan 31	Stem Cell Research Policy and Advocacy: The National Landscape
Feb 2	Stem Cell Research and Local Policy: HW#2 Due Policymaker statement
Feb 7	Stem Cell Research and Policy: The Global Landscape
Feb 9	How Do Cells Work? Cells, Proteins, and Genes
Feb 9-14	ReelAbilities Film Festival
Feb 14	How Do Cells Regenerate?
Feb 16	What Influences Cell Fate? Genes in Time and Space/ Planaria Lab
Feb 21	Natural Sources of Stem Cells: Embryo, Umbilical Cord, Adult
Feb 23	The 1 st Human Cell Line: HeLa Race, Class, & Gender Case
Feb 24	HEALING Performance and Panel: Tishman Auditorium 7-9pm
Feb 28	Case #1: HeLa: Immortality and Cancer Role Play/ Planaria Report Due
Mar 1	Case #1 Debrief
Mar 6	Case #1 Essay Due Stem Cell Sources: Embryos, IVF, iPS: Genetics and Genetic Reprogramming
Mar 8	Stem Cell Sources: Clones, ANT, Parthenotes and Triploids
Mar 13	Spring Break
Mar 15	Spring Break
Mar 20	Stem Cell Sources: Chimera, Hybrids, and Cybrids
Mar 22	*** Midterm
Mar 27	Female Bodies and Stem Cells: The Egg /Womb/ Fat/ Breasts
Mar 29	Egg Retrieval: The Risks and Benefits
Apr 3	Commodification of Female Bodies
Apr 5	Case #2 Oocytes: Gifts and Commodities Role Play
Apr 10	Religious, Moral, and Political Philosophies
Apr 12	Advocacy & Policy: Birth, Death, & Clones Case #2 Essay Due
Apr 17	Disability & Advocacy
Apr 19	Disability & Advocacy Terra Incognita Film (20 minutes)
Apr 24	SC Therapy: Hope and Hype
Apr 26	Terra Incognita Essay Due: Patents and Protections
May 1	General Strike
May 3	Biobanks and Public Access Controversial Quote Essay Due
May 8	Social Policy Making: National NBAC and NYSTEM
May 10	Final Assessment /Exam

Portfolio

All of your work for the semester will be collected in a **BB portfolio** so that we can monitor your progress. To maximize your understanding of the assigned reading material, I will provide review questions, assignments, guidelines, and rubrics for interpreting the literature, and encourage you to bring questions to class. .Get comfortable taking notes and bringing the readings to each class.

Special Events and Resources:

BB will have science-related events that take place in NYC. Some are listed below.

- ERESERVES: Unnatural Causes: Seven Part Documentary about Health Inequity. See BB <http://ereserves.newschool.edu/eres/coursepass.aspx?cid=1186> Password: **5t3mc3II5**
- NYSTEM Committee Meetings (Ethics, Funding) <http://stemcell.ny.gov/events.html>
- NYSCF: Private foundation for NY based stem cell research: blog, events, etc <http://nyscf.org/>
- NYU Kimmel Center for Stem Cell Biology Seminars and the Stem Cell Club: <http://kimmelstem.med.nyu.edu/events/stem-cell-seminar-series>
- Columbia U Stem Cell Seminars: <http://stemcell.columbia.edu/current-seminars.html>
- Rockefeller Events: <http://featuredevents.rockefeller.edu/>
- Jan 29- Feb 2 : Film Screening of Eggsplotation: Documentary by Jennifer Lahl. Soho Digital Arts. <http://sohodigart.com/Calendar.html>
- Feb 9-14 ReelAbilities Disability Film Festival <http://www.reelabilities.org/>
- The Body and State Feb 2011: How the State Controls and Protects the Body focused on egg trafficking, reproductive technologies, and the patenting and ownership of cells and tissues . Link and two issues of the Journal Social Research dedicated to the papers presented <http://www.newschool.edu/cps/body/>
- Feb 24: 7-9pm Healing: Play by alumna Charnell Covert, Tishman Auditorium <http://www.charnellcovert.com/The-Healing-Movement.html> .
- The Way of All Flesh Film Screening by Adam Curtis. TBD
- Artsience Parsons Guest Lecture in Hybrid Culture Class : TBD

BOOK: Skloot, R. 2010. The Immortal Life of Henrietta Lacks. Crown Publishers. 384. Can be purchased at Bluestockings bookstore for \$25.00 or at the Strand. Book Sellers will be on campus the second day of class <http://bluestockings.com/>. All other readings on Bb.

Recommended Books: A list of Recommended books will be available as a separate document and posted on Bb with price, availability and brief synopsis. In addition, journals, websites, and societies with a focus on situating science in context will also be included. For more on this see www.situsci.ca.

COURSE EXPECTATIONS:

Policy on Attendance and Lateness Policy: Participation is key to seminar pedagogy. Students are expected to attend classes regularly and promptly. For this course it is imperative to attend all classes. If you miss class it is your responsibility to check with me and Blackboard for changes or updates, obtain class notes and obtain information from the session from another person in class. For courses that meet twice a week, more than 4 absences will result in a failing final grade. If a student is more than 10 minutes late to a class, this will count as an absence. In case of personal and medical emergencies, students should contact their instructors as well as the Director of Academic Advising. Due to the accelerated nature of this course, students should miss no more than one class.

Policy on late Assignments: Assignments guide you through new material. Some questions will be thought provoking and many will involve writing and you are encouraged to meet with your science fellow for this course Joe Maloney. Your weekly assignments make up the majority of your final grade. If LATE, they will be corrected but your score will drop 5% per class session. Late assignments will be allowed only due to extenuating circumstances and will require prior approval. I discourage late homework, because it does not allow me or you to assess your learning in a timely and effective manner and prevents us from addressing those aspects that are unclear or confusing from the beginning. In case of personal and medical emergencies, students should contact their instructors as well as the Director of Academic Advising.

Statement on Plagiarism: Plagiarism is the unacknowledged use of someone else's work as one's own in all forms of academic endeavor (such as essays, theses, examinations, research data, creative projects, etc.) which may be derived from a variety of sources (such as books, journals, Internet postings, student or faculty papers, etc.). Plagiarism goes beyond use of quotes. Paraphrasing someone else's ideas, words, or work needs to be referenced appropriately with in-text citations and a complete bibliography. Students should refer to the Policy on Academic Honesty in the Eugene Lang College catalog for full information on the consequences of plagiarism.

You must have a current student I.D, use the internet and electronic databases for research, and use Blackboard, and best if you also use Refworks, the bibliographic software on campus.

Students with disabilities. In keeping with the University's policy of providing equal access for students with disabilities, any student requesting accommodations must first meet with Student Disability Services. Jason Luchs or a designee from that office will meet with students requesting accommodations and related services, and if appropriate, provide an Academic Adjustment Notice for the student to provide to his or her instructors. The instructor is required to review the letter with the student and discuss the accommodations, provided the student brings the letter to the attention of the instructor. This letter is necessary in order for classroom accommodations to be provided. Student Disability Services is located at 79 Fifth Avenue - 5th Floor. The phone number is (212) 229-5626. Students and faculty are expected to review the Student Disability Services webpage. The webpage can be found at <http://www.newschool.edu/studentaffairs/disability/> and the office is available to answer any questions or concerns.

Course Grading: Subject to Change

Grading Scale:

HW#1 Policymaker Summary	50 points	100%-93%	A
Case Studies and Essays (2)		100%-93%	A
HeLa Character Statement	25 points	92%-90%	A-
HeLa Role Play	25 points	89%-87%	B+
HeLa Essay	50 points	86%-83%	B
Oocyte Character Statement	50 points	82%-80%	B-
Oocyte Role Play	50 points	79%-77%	C+
Oocyte Essay	100 points	76%-73%	C
Terra Inconita Essay	150 points	72%-70%	C-
Controversial Quote Essay	150 points	69%-67%	D+
Midterm Exam	50 points	66%-63%	D
Course Evaluation	50 points	59%-	F
Final Exam	150 points		
Class Participation	<u>100 points</u>		
	1000 points		

Deadline Calendar**Assignments Due**

Jan 26	HW #1 SALG and Three Questions about Course/Syllabus (BB disc)
Feb 3	HW #2 Policymaker summary
March 1	Case Study #1 HeLa Role Play + Narrative Bio
Mar 8	Case Study #1 HeLa Essay Due
March 22	Midterm
April 5	Case Study #2 Oocyte Role Play+ Narrative Bio
April 12	Case Study #2 Oocyte Essay Due
April 26	Terra Incognita Essay Disability Rights Due
May 3	Controversial Quote Essay Due
May 10	Exam/Assessment
May 14:	All Rewrites due

CALENDAR BY DAY: Readings completed BY the day they appear**Jan 24 Stem Cell Research: Promise, Problems, and Potential****Students Generate Questions about SCR- Post to Blackboard****Introduction to the course- see Bb First Day Folder****Chamany Presents quick overview of cell potential (See PPT)****Websites in the NY Stem Cells Folder on BB: NYSTEM, NYSCF, CIRM, CGS, ISSCR****Prequiz****In Class Video:** Nova Science Now. Stem Cell. 2005. (15 min)<http://www.pbs.org/wgbh/nova/sciencenow/3209/04.html>**In Class Video:** Religion & Ethics Weekly. Embryonic Stem Cell Controversy. April 2, 2010. (7min)<http://www.pbs.org/wnet/religionandethics/episodes/april-2-2010/embryonic-stem-cell-controversy/5995/>**Jan 26 Science the Endless Frontier?****HW #1 Due SALG Online Survey and Three Questions about Course/ Syllabus Bb Discussion**

This series of readings questions the notion of science for the public interest and more specifically economic gain and national security. The collection includes three very short news pieces about the interplay of policy, economics and stem cell science in New York, the longer historical report authored by Vannevar Bush, the Director of The Office of Scientific Research and Development in 1945, two critical responses to the Bush Report in 1994, and the Breakthrough Institute's historical case collection that illuminates the ways in which legislation supporting the funding of basic science research in biotech has led to blockbuster drugs for the U.S. For the longer report by Bush, pay close attention to the letter exchange between Roosevelt and Bush, as well as Chapter 3: Science and Public Welfare. Collectively the readings allude to Two Cultures (science and non-science) and they ways in which this social construction can breed cooperation or competition. The piece by Berrett demonstrates the ways in which the "Two Cultures" continue to vie for public support and funds and argues that investment in all three cultures (science, social science, and humanities) is essential for American competitiveness. In response to a bipartisan request from Congress, a new blue ribbon commission made of up of 41 members from the social sciences and arts (humanities) has been formed to place social science and humanities on equal footing with the natural sciences and math in the U.S. Interestingly, as the commentary on the Inside Higher Education thread indicates some are concerned that the commission

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is not made up of those who may in fact be close to the best practices of undergraduate education, a complaint that also comes out of the natural sciences community with regard to approved funding for educational efforts in the sciences. The last piece by Wendy Dean suggests that stem cell research is vital for national security. There are a set of review questions to accompany this set of readings; review prior to reading.

Readings: (37 pages total)

The Local:

1. Nelson, Libby. June 26, 2009. New York State Allows Payment for Egg Donations for Research. New York Times. A20. (1 ½ page) <http://www.nytimes.com/2009/06/26/nyregion/26stemcell.html>
2. Fouhy, Beth, Dec 22, 2010. New York Growth Ebbs, State to Lose 2 Seats in Congress. Associated Press. (1page) <http://observertoday.com/page/content.detail/id/125928/NY-growth-ebbs--state-to-lose-2-seats-in-Congress.html?isap=1&nav=5025>
3. Matthews, Cara. Jan 12, 2011. Group says more stem cell funding would create more jobs. VoteupNY.com. (½ page) <http://blogs.democratandchronicle.com/voteup/2011/01/12/group-says-more-stem-cell-funding-would-create-more-jobs/>

The National

4. Bush, Vannevar. 1945. Science: The Endless Frontier. Original letter from Roosevelt to Bush and his report. Focus on Letter Exchange (1-5) and Chapt 3 (9-13) (18pages) <http://www.nsf.gov/od/lpa/nsf50/vbush1945.htm#transmittal>.
5. Cozzens, Susan. Social Sciences: Shunned at the Frontier. In Science the Endless Frontier: Learning from the Past, Designing for the Future. Highlights from a conference series held between 1994-1996. P101-105. <http://www.cspo.org/products/conferences/bush/fulltexthighlights.pdf>
6. Crow, Michael. Beyond the Endless Frontier. In Science the Endless Frontier: Learning from the Past, Designing for the Future. Highlights from a conference series held between 1994-1996. P-114-118 <http://www.cspo.org/products/conferences/bush/fulltexthighlights.pdf>
7. Jenkins, J. Swezey, D. and Y. Borofsky. Dec 2010. Where Good Technologies Come From: Case Studies in American Innovation. Breakthrough Institute. p 4-5 and 34-35. <http://thebreakthrough.org/blog/Case%20Studies%20in%20American%20Innovation%20report.pdf>
8. Berrett, Dan. Feb 2011. Yanked from the Margins. Inside Higher Ed. Online. (2 pages) http://www.insidehighered.com/news/2011/02/18/new_commission_to_advance_the_cause_of_the_humanities_and_social_science
9. Dean, W. Dec 2011. The armed forces institute of regenerative medicine: a collaborative approach to the department of defense- relevant research. Regenerative Medicine 6 (6 Suppl):71-74.

******Jan 29- Feb 2: Film Screening of Eggsplotation by Jennifer Lahl. 2010.**

<http://www.eggsplotation.com/> (40 min film and 30 min discussion with director)

Soho Gallery for Digital Arts 138 Sullivan Street. nightly screenings at 5,7,9pm advance tickets available at use Search tool with title of film \$12 www.brownpapertickets.com and info@eggsplotation.com
Direct Link <http://www.brownpapertickets.com/event/214954>

Jan 31: Stem Cell Research Policy and Advocacy: The National Level

(Review of Genotype+Env signals= Phenotype; Gene Pool + Changing Env→ Evolution

Diane Degette is a staunch advocate for the expansion of stem cell research and she invokes Vannevar Bush's call for more science on page 136. As you read her memoir, you will get a glimpse at the workings of Congress and the ways in which public interest groups can influence legislation and policy. The Fossett policy brief provides a view of states' responses to the maintenance of the Dickey Wicker

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Amendment (pay close attention to the tables), and the Solomon and Jakimo/Fernandez follow suit with more history of the policy ping-pong effect. Consider the pro-stem cell arguments; then imagine yourself as an opponent. What would you do or say to challenge this position? Though Degette operates through Congress and Solomon and Fernandez work through philanthropic advocacy organizations, Professor and bioethicist Alta Charo tackles some of the same issues from a different position. What kind of charge does she leave to scientists, interest groups, and politicians? There are guiding questions on Bb. Be Prepared to explain the Dickey Wicker Amendment in your own words.

In Class Video:

1. **Aug 2010. Degette** Wants to Reintroduce Embryonic stem cell bill.
9News.com.<http://www.9news.com/video/default.aspx?bctid=595231897001>
2. **Proposition 71:** In Lines That Divide. <http://linesthatdivide.com/> (4th clip Prop 71/Keirstead/Lahl)
3. **Sean Morrison. Ibiomagazine.** Michigan Stem Cell Prop.
<http://www.ibiomagazine.org/index.php/issues/december-2010-issue/sean-morrison>
4. **NAS 2001 Human cloning Video. C-Span.**
5. **Scientists and Engineers of America.** Mach 9, 2009. Release with links to Obama video, breakdown of the executive order and background information. Notice the mention of members of NYSTEM, Degette, and members of the Reeve family.
<http://sharp.sefora.org/issues/executive-order-on-stem-cell-research/>

Readings (114 pages)

1. Degette, D. 2008. Sex, Science, and Stem Cells: Inside the Right Wing Assault on Reason. Lyons Press. Please read the Chapt 1 and 2 (1-38), 6, and 7 (p 88-137)I know it seems like a lot, but I read the whole book in one day, as it is very conversational and in the genre of memoir.
2. Fossett, J. Aug 2, 2007. Federalism by Necessity: State and Private Support for Human Embryonic Stem Cell Research. Rockefeller Institute Policy Brief. 1-13.
3. Solomon, S. March 9, 2009. Patients Before Politics: Putting Science First. Huffington Post. (1 page).
4. Jakimo, A. and Fernandez, A. 2011. Innovation in stem cell advocacy: you only get what you can measure. Regenerative Medicine 6(Suppl 6):127-132.
5. Charo, A. Sept Oct 2006. Fear and the first amendment. Hastings Center Report. 12-13.
6. Van Eyck, Masarah. 2006. Political Science: Bioethicist R. Alta Charo Blends Science with Activism. UW School of Medicine Quarterly. <http://www.scribd.com/doc/9666838/Alta-Charo-PDF>
7. Please take some notes on each chapter and bring the book to class.
8. Review Questions on Bb.

Feb 2: Stem Cell Research: New York State

*****HW#2 Due: Policymaker's stance on stem cell research. See BB for assignment/links

In Class Video: Nightlife Adoptions. You Tube. President Bush's speech in 2005 Veto of the Castle Degette Stem Cell Research Enhancement Act. (20 minutes video with interrupted discussion)http://www.youtube.com/watch?v=CVV87EH6VLk&playnext=1&list=PL5A2770BBE8166D49&feature=results_main

Feb 7: How Do Cells Work? Cells, Proteins, and Genes

In this chapter from the trade book that arose from a series of front page news articles in the *Washington Post* Rensberger reminds us of the diversity of cell types and their ability to communicate and influence each other's behaviour whether a single celled organism or a multicellular one. One important reoccurring theme is the concept of self-assembly. Rensberger traces the history of cell

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biology, and shows us that although cells adopt different functions and shapes, there are some characteristics that are central to all cells (Cell Theory). He also provides a timeline of the technologies that led to Cell Theory and the establishment of the first human cell line; a cell that has become immortal and regenerates in a petri dish forever.

PPT: What is a Cell?

In Class Video:

1. The Inner Life of the Cell HHMI <http://www.studiodaily.com/main/searchlist/6850.html>
2. Treadmilling Macrophage <http://www.youtube.com/watch?v=O21VnOgICa8&feature=related>
3. Human Granulocyte Kills Cervical Cancer Cells
<http://www.youtube.com/watch?v=nJEFcNbEWQs&NR=1&feature=fvwp>
4. John Bonner's Slime mold Movies (Dicty) <http://www.youtube.com/watch?v=bkVhLJLG7ug>
5. Virtual Sea Urchin <http://virtualurchin.stanford.edu/fertlab2.htm>
6. Eurostemcell. Cell Culture. <http://www.eurostemcell.org/stem-cell-videos-and-films#conversations> (6minutes)

Readings:

1. Rensberger, B. "Chapter 1: A Particle of Life" *In Life Itself*. This reading will address some of our questions centered on the definition and use of cell lines. PLEASE NOTE THAT THE PDF IS BACKWARDS SO READ FROM LAST PAGE TO FIRST
2. Review questions on Bb.

Feb 9: How Do Cells Regenerate?

The textbook chapter introduces you to the basic processes of cell organization, cell division, reproduction, and cloning. We are going to move slowly through this chapter and spread the material over a couple of weeks. Consider the ways in which cells must respond to external and internal signals to organize and maintain a particular size and shape for a specific tissue. How do the cells know when to divide and when to stop? Which macromolecules need to reorganize and for what purpose and in which stage of the cell cycle? Why don't your organs continue to grow as you age? Why do some cells divide infinitely while others have a shorter life span? Dolly the first cloned mammal, was a sheep that experienced largeness syndrome (oversized organs); might the regulation of cell division and growth of organs have gone awry in the cloning process? Consider this in light of Jennifer Kahn's piece concerning the cosmetic application of stem cells overseas.

Videos:

1. Eurostemcell. Dolly and Beyond. <http://www.eurostemcell.org/stem-cell-videos-and-films#conversations>

Readings:

1. Minkoff and Baker. "Stem Cells, Cell Division, and Cancer." *In Biology Today: An Issues Approach 3rd Edition*. 414-419. We will only the first few pages of this chapter regarding cell division and cell signaling. I have also included an additional pdf of one of the figures in this chapter in color so you can appreciate the diversity of potential in the stem cell lineage.
2. Please visit this link http://nobelprize.org/educational_games/medicine/2001/. This is the Nobel Prize Education site, and if you click on the Cell Cycle Game link you can play an interactive game that emphasizes the checkpoints and stages necessary for the cell to progress through cell division. Try to imagine the environmental signals that would be at play that would instruct a cell to divide.

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3. HHMI. 2003 The Cell Cycle Animation and Checkpoints and Cell Cycle Control. The Biology of Cancer. These two animations take about 20 minutes to click through.
<http://outreach.mcb.harvard.edu/materials.htm>
4. Kahn, Jennifer. Oct 16, 2005. The Stem Sell. New York Times.
http://www.nytimes.com/2005/10/16/style/tmagazine/t_b_2136_2141_stemcell_.html?pagewanted=all&r=0
5. Jabr, F. Dec 17, 2012. In the Flesh: The Embedded Dangers of Untested Stem Cell Cosmetics. Scientific American. <http://www.scientificamerican.com/article.cfm?id=stem-cell-cosmetics>

Feb 14 How Do Cells Communicate with Their Environments?

As we continue to move through the textbook chapter, we revisit the concept of cell signaling, the ability of cells to respond to external signals in their environment by regulating cellular processes such as protein synthesis. To understand what it means to differentiate, you will need to learn a little about genetics, so use "Journey into DNA" website to gain a sense of scale. The material builds on the textbook reading in Minkoff and Baker with respect to gene expression. The SEED Magazine Crib Sheet is an essential for the remainder of the class. What we will focus on today is how cells can turn genes on and off for the long term (gene regulation via nuclear reprogramming; modifications to the chromosomes) and transient control of gene expression (gene regulation via transcriptional complexes that interact with DNA). Please print the ppts for today as handouts (6 slides per page) so you can take notes.

Readings:

1. Richli, Cybu and Lee Billings. Genetics. Cribsheet #12. SEED Magazine. 2008. This colorful handy pull out should be kept with you for the entire course and you can refer to it whenever you need to remind yourself how a cell changes behavior depending on time and place through the turning on or off of genes via the Code of Life.
2. Minkoff and Baker. "Stem Cells, Cell Division, and Cancer." *In* Biology Today: An Issues Approach 3rd Edition. 418-422.
3. Review Questions on BB.

Websites

1. Journey into DNA: Sense of Scale Nova. <http://www.pbs.org/wgbh/nova/genome/dna.html#>
2. Why do Fireflies Glow? Learn Genetics.
<http://learn.genetics.utah.edu/content/begin/dna/firefly/>
3. Gene Switches. HHMI http://www.hhmi.org/biointeractive/evolution/Gene_Switches/01-vid.html

Feb 16: What Influences Cell Fate? Genes in Time and Space

If time allows we will perform a Planaria Worm Regeneration Experiment/ HHMI Video of Alejandro Sanchez Alvarado and Planaria Regeneration

http://www.hhmi.org/biointeractive/stemcells/planarian_regen.html

As cell biologists began to investigate cell differentiation, a question arose: Are genes lost as cells differentiate? Which experiments reviewed here sought to answer this question and which supported the notion that genes are lost, and which refuted gene loss during differentiation? Some of these experiments try to determine which is more important for cell differentiation or specialization; a cell's genes or a cell's environment. What do the experiments here suggest? Consider the scientific method (Observations, Questions, Hypotheses, Experiments, Results, Conclusions, More questions...) and the Experimental Heuristic (Sample, Manipulation, Detection, Trace) and try to outline this method in the context of the Spemann and Mangold explant experiments and the Gurdon nuclear cloning experiments.

Readings:

1. Minkoff and Baker. "Stem Cells, Cell Division, and Cancer." *In Biology Today: An Issues Approach 3rd Edition*. 423-426. I have also included an additional pdf of one of the figures in this chapter in color so you can appreciate the diversity of potential in the stem cell lineage.
2. Review Questions on BB.

Websites

1. Bennett, Tara and Susan Johnson. 2007. HHMI Nuclear Stem Cells Differentiaion: A Chromosome View. This animation takes about 5-10 minutes and reviews nuclear reprogramming in detail. <http://www.hhmi.org/coolscience/resources/SPT--FullRecord.php?ResourceId=53>
2. HHMI. 2007. Embryogenesis and the Origin of Stem Cells. This animation take about 15 minutes and does a very nice overview of embryogenesis while comparing embryos, fetal/ pregnancy tissues/ and adult stem cell potential. <http://outreach.mcb.harvard.edu/materials.htm>

Feb 21 Natural Sources of Stem Cells: Embryos, Umbilical Cord, Adult:**Genetics and Genetic Reprogramming**

In the last class session we discussed the role of differential gene expression and the importance of this becomes clear as we see how the timing and organization of gene expression is essential for both reproduction and the embryonic development of a new organism: this is often referred to as genetic reprogramming. Again, we revisit some of the cursory material presented in the Minkoff and Baker chapter but dive deeper into fertilization and embryonic development. In doing so, what emerges are three classes of potential stem cells: embryonic, umbilical cord, and adult. The HHMI Embryonic Development animation is essential and only 2 minutes in length. Please note that the Life's Greatest Miracle Program is about 45 minutes in length and should be viewed on campus or with a fast internet connection (it is broken up into 5 short segments). The required websites are INTERACTIVE; set aside at least 60 minutes to interact with these sites.

In Class Video:

HHMI Stem Cells and Development: Beautiful Primitive Streak Animation

<http://www.hhmi.org/biointeractive/stemcells/animations.html>

Tissues of Life. 2006. Science Museum of Minnesota. Click on the central image the Embryonic cells and note the juxtaposition of the image in the lab versus in the body.

http://www.smm.org/tissues/stem_cell_choices.php

Readings:

1. Minkoff and Baker. "Stem Cells, Cell Division, and Cancer." *In Biology Today: An Issues Approach 3rd Edition*. 426-432.
2. Gilbert. 2008. All I needed to know I learned about during gastrulation LSE. (7): **12-13**. Please note that this paper is connected to two others in a series, you only need to read pages 12-13 by Gilbert. This paper is accompanied by a visual ppt given in 2005 at the Society for Developmental Biology. <http://www.sdbonline.org/fly/gilbert/gilbert01.htm>

Websites:

3. Visit the HHMI. Human Embryonic Development. 2006 Holiday Lecture. Potent Biology: Stem Cells, Cloning and Regeneration. . A two minute animation http://www.hhmi.org/biointeractive/stemcells/human_emb_dev.html .
4. Visit the HHMI. Differentiation and the Fate of Cells. 2006 Holiday Lecture. Potent Biology: Stem Cells, Cloning and Regeneration. A two-minute animation . <http://www.hhmi.org/biointeractive/stemcells/differentiation.html>

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5. HHMI. 2007. Embryogenesis and the Origin of Stem Cells. This animation takes about 15 minutes and does a very nice overview of embryogenesis while comparing embryos, fetal/ pregnancy tissues/ and adult stem cell potential. <http://outreach.mcb.harvard.edu/materials.htm>
6. Visit this Link: University of Michigan, Stem Cells Explained and Explored. Interactive; Use the Tabs at top to Embryonic Stem Cells, Cell Specialization, and Adult Stem Cells http://ns.umich.edu/stemcells/022706_TabA.html
7. Visit this link: University of Utah. "What Is A Stem Cell?" Online. Genetics Science Learning Center at the Eccles Institute of Human Genetics University of Utah. Available in Spanish. This site has an intricate interactive animation that contains a sidebar of corresponding text. Choose the Blood Cell Niche to revisit our conversation about hemoglobin and red blood cell differentiation.
 8. <http://learn.genetics.utah.edu/content/tech/stemcells/sctypes/>
 9. <http://learn.genetics.utah.edu/content/tech/stemcells/scintro/index.html>
10. Video: Rap Song on Development by College Students http://www.youtube.com/watch?v=9k_oKK4Teco
11. Video: Programs 1-5 on Life's Greatest Miracle" PBS . Five short segments totaling 45 minutes. <http://www.pbs.org/wgbh/nova/miracle/program.html>
12. Humphreys, Ciaran. 2008. The Primitive Streak Dress Collection by the Helen and Kate Story. Belfast. <http://www.helenstoreyfoundation.org/pro2.htm> .The Story sisters, one a designer and the other a developmental biologist, created this exhibit to display the first 1000 hours of embryogenesis. View the Film (link at bottom), and click through the image slide show (on the film page upper left corner). Or look for the tab" The Collection."
13. REVIEW this VIDEO: Stem Cells http://www.youtube.com/watch?v=mUcE1Y_bOQE This video is a great example of environmentally regulated genes expression in early development giving rise to the placenta and the embryo (CDX2 and Oct3/4). Note that here the environment is the womb; the environmental signals are maternally expressed proteins that are in a concentration gradient in the womb, and paternally expressed RNAs that enter the cytoplasm of the egg. Both the maternal and the paternal factors influence gene expression- the former via transcriptional control (DNA→ RNA) and the latter in the form of posttranscriptional control (RNA→ Protein) via RNA interference.

Optional for instructors at other institutions

Ppt in 2005 for the Society of Developmental Biology for the Gilbert. 2008. All I needed to know I learned about during gastrulation LSE. (7): 12-13. <http://www.sdbonline.org/fly/gilbert/gilbert01.htm>
2001. "Appendix A Early Development. *In* Stem Cells Scientific Progress and Future Research Directions. National Institutes of Health. 1-18. This is a bit heavy in terms of GENE names, so try to focus on the big picture, only pay attention to the Oct4 gene's role, and only read from pages 1-12, and after that look for highlighted regions or sticky notes to guide your reading. <http://stemcells.nih.gov/info/2001report/appendixA.asp>

Feb 23 The First Human Cell Line: Case Study on Race, Class, and Gender

****HW#3 Planaria Report Due

In this collection of readings, we will use the case based approach to learning- **SO ALL READING IS DONE IN CLASS. DO NOT READ AHEAD.** The case is the HeLa cell line and the ways in which this cell phenomenon intersects with race, class and gender.

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In Class Video: Excerpts from Curtis, A. 1998. "Modern Times: The Way of the Flesh". Produced by BBC. This documentary is based on the history of Henrietta Lacks and the emergence of human cell lines. The documentary was aired in BBC's Modern Times series in 1998, and won Best Science and Nature Documentary at the San Francisco International Film Festival. At position 18.58 the video begins to discuss the racial aspects of the HeLa cell line. <http://tenpercent.wordpress.com/2009/02/08/adam-curtis-the-way-of-all-flesh/>

Readings:

1. Ehrlich, R. (1997). In Memory of Henrietta Lacks. Congressional Record. <http://0-www.gpo.gov.library.colby.edu/fdsys/pkg/CREC-1997-06-04/pdf/CREC-1997-06-04-pt1-PgE1109.pdf>
2. ErinC. Jan 30, 2009. The Story of Henrietta Lacks: A Lesson in Biology and Ethics. Spittoon. 23andme blog. <http://spittoon.23andme.com/2009/01/30/the-story-of-henrietta-lacks-a-lesson-in-biology-and-ethics/> AND
3. Skloot.R. (April 16, 2006). Excerpt: Taking the Least of You. New York Times Magazine. New York.: 38,(full article is 11 pages).
4. Culliton, B. J. 1974. HeLa cells: contaminating cultures around the world. Science. 184:1058-1059.
5. Katsnelson, A. June 2010. Biologists tackle cell's identity crisis. Nature. 465: 537. http://www.nature.com/news/2010/100602/full/465537a.html?s=news_rss

******* HEALING Play by Charnell Covert, Lang Alumn, and First Year Faculty Member*******
Tishman Auditorium 7-9pm. RSVP healblackwomen@gmail.com and Free

Feb 28 The First Human Cell Line: HeLa Case Study on Race, Class, and Gender

******HeLa Case Study Role Play - see BB CASE STUDIES FOLDER**

This collection of readings introduces the ethical oversight and marketability of human subjects research. Landecker provides us with two cases studies; that of the Mo cell line and the HeLa cell line. She poses these question: What are cell lines? How did they come into being? Is the cell line continuous with the organism from which it came of separate, and invention? What scientific, legal, economics, and rhetorical practices maintain the conditions of their existence? Weasel provides feminist critique of the lack of ethical training in the research community while Lantos revisits the sentiment in Vannevar Bush's Science the Endless Frontier by juxtaposing a fictitious story with the real life HeLa one. Both Keiger and the GAO report suggest that the evolution of the institutional review board process may not go far enough given the unusual nature of cells as propagating entities or "biologics". Not surprisingly, in the era of stem cell research new oversight committees have emerged such as ESCROs (Embryonic Stem Cell Research Oversight Committees) and SCROS. Though some progress has been made it seems that for the time being we may still have a need for reparations. What do you make of Palmer's criticism in the context of the Cohen article.

In Class Video: Skloot, Rebecca. <http://rebeccaskloot.com/book-special-features/audiovideo/>

Timeline: Biba, Erin. Feb 2010. Henrietta Everlasting: 1950s Cells Still Alive, Helping Science. Wired Magazine. http://www.wired.com/magazine/2010/01/st_henrietta/

******Guest** Charnell Covert. Alumni of Lang, and Building Leadership in Black Women's Health Fellow, Suffolk University

Readings:

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1. Landecker, H. 1999. Between beneficence and chattel: The human biological in law and science. *Science in Context*. 12 (1): 203-225
2. Weasel, Lisa H. 2004. Feminist Intersections in Science: Race, Gender and Sexuality Through the Microscope. *Hypatia*. 19(1) Winter:183-193. Note that Weasel has written extensively on cell biology, equity, and values (cloning as well).
http://www.lisaweasel.com/LisaWeasel.com/Academic_Work.html
3. Lantos, John. July August 2010. A Better Life Through Science? *Hasting Center Report*. 40 (4):22-25.
4. Keiger, D. June 2, 2010. Immortal Cells, Enduring Issues. *John Hopkins Magazine*:1-6. (informed consent history and reach through).
5. GAO. March 26, 2009. Human Subjects Research. Undercover Tests Show the Institutional Review Board System is Vulnerable to Unethical Manipulation. Government Accountability Office. <http://www.gao.gov/products/GAO-09-448T> (1/2 page summary).
6. Palmer, L. November December 2010. Private Reparations. *Hasting Center Report* 40 (6):4. (1 page)
7. Skloot, Rebecca. April 6, 2010. Immortal Life of Henrietta Lacks FAQ#2: Did Skloot really flunk high school. (1 page).
http://scienceblogs.com/culturedish/2010/04/immortal_life_of_henrietta_lac.php Note that more information about this project can be found here at Rebecca Skloot's website
<http://rebeccaskloot.com/the-immortal-life/>
8. Skloot, R. TBD. Chapters 1, 2,3,4, 7, 8, 12,14, 17,18, 20, 21, 22, 27, 28,30,32, and the afterward *In The Immortal Life of Henrietta Lacks*. (14 pages).
9. Cohen, Patricia. Feb 5, 2011. Returning the Blessing of an Immortal Life. *New York Times*. C1.
<http://www.nytimes.com/2011/02/05/books/05lacks.html>

Mar 1 HeLa Debrief and Overview

March 6 Sources of Stem Cells: Embryos, IVF, and iPS

***Case #1 HeLa Essay Due

Guest Designer: Julia Wargaski, Assistant Professor of Communication Design, Parsons

We continue to explore the realm of pluripotency, through techniques used to generate stem cells, and to identify and mark cells as “stemmy,” or having a characteristic gene expression profile of a pluripotent stem cell. In 1951, the HeLa line was established and thus an era of cell culture followed. The next set of cells to be placed in dishes were gametes (eggs and sperm) to create embryos. This technique, In Vitro Fertilization (IVF) provides researchers with extranumerary embryos (embryos that might not be implanted into a woman). The readings here will explore this technique, and others designed to create sources of stem cells. As work on both embryonic and adult stem cells proceeds, the fate of iPS cells is unknown given the new findings in genetic reprogramming differences and chromosomal abnormalities. In total the readings are about 10 pages in length (most are only one page long) and there is an optional reference readings by Battey et al (10 pages) and two animations: one you have seen before but we will revisit it here.

Everyone Reads:

1. Gearhart, J. et al. Jan 7 2011. In Vitro Fertilization, the Nobel Prize, and Human Embryonic Stem Cells. *Cell*.8:12-15

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2. Cervera and Stojkovic. Feb 1 2008. Commentary. SCNT- Progress and Promise. *Stem Cells*. 26 (2):494.
3. Vogel, G. Dec 19, 2008. Breakthrough of the year: Reprogramming cells . *Science*. 322 (5909): 1766-67.
4. Hayden and Baker. March 1, 2009. Virus-free pluripotency for human cells. *Nature News*.
5. Dolgin, Elie. April 2010. Gene flaw found in induced stem cells. *Nature*. 464:633.
6. McCarthy, Nicola. Nov 2010. Out for the count. *Nature Reviews Cancer*. 10:
7. Scripps Research scientists develop new test for ‘pluripotent’ stem cells March 2011 Scripps. <http://www.google.com/search?client=safari&rls=en&q=8.%09Scripps+Research+scientists+develop+new+test+for+‘pluripotent’+stem+cells&ie=UTF-8&oe=UTF-8>
8. ICSP: A New Stem Cell Enters the Mix. Induced Conditional Self Renewing Progenitor Cells March 4, 2011 published online. <http://www.sciencedaily.com/releases/2011/03/110307101301.htm>
9. OPTIONAL Battey et al. 2008. “Chapter 8: Alternative Methods For Preparing Pluripotent Stem Cells. *In* Regenerative Medicine. National Institutes of Health. 1-12 <http://stemcells.nih.gov/staticresources/info/scireport/PDFs/Chapter8.pdf>

VIDEO

10. Vidali, A. April 3 2011. IVF Procedure. A Simple Explanation of the In Vitro Fertilization Cycle. <http://www.youtube.com/watch?v=7oNg6Lm4ZJ4>
14. REVIEW this VIDEO: Stem Cells http://www.youtube.com/watch?v=mUcE1Y_bOQE This video is a great example of environmentally regulated genes expression in early development giving rise to the placenta and the embryo (CDX2 and Oct3/4). Note that here the environment is the womb; the environmental signals are maternally expressed proteins that are in a concentration gradient in the womb, and paternally expressed RNAs that enter the cytoplasm of the egg. Both the maternal and the paternal factors influence gene expression- the former via transcriptional control (DNA → RNA) and the latter in the form of posttranscriptional control (RNA → Protein) via RNA interference.
15. Eurostemcell. November 2012. Stem Cells-The future : An Introduction to iPS cells. (16:42) <http://www.eurostemcell.org/stem-cell-videos-and-films#conversations>

IMAGES

16. IMAGE RESOURCE. 2001. “Appendix E. Stem Cell Markers.” In *Stem Cells Scientific Progress and Future Research Directions*. National Institutes of Health. 1-12. No need to read but we will return to this image of a FACS sorter which is linked to an earlier powerpoint.
17. Melton, D. How A Microarray Works. http://www.hhmi.org/biointeractive/media/using_dna_chip-lg.mov
18. Kubecik, S. March 1, 2011. Infographic. Epigenetics- A Primer. *The Scientist*. <http://the-scientist.com/2011/03/01/epigenetics—a-primer-2/>
19. Conklin, Bruce. Waddington Videos. Animations from the Burman Institute on Cell Reprogramming.
20. Review Questions to guide your reading on BB.

Mar 8 Sources of Stem Cells: Cloning: SCNT, ANT, Triploids

In 1999, the journal *Science* named Stem Cell Research as the Breakthrough of the Year spurring growing interest in creating stem cells with particular characteristics inspiring researchers to look beyond the extranumerary embryos obtained from IVF clinics. In August of 2000, Britain’s Chief Medical Officer chaired an advisory committee that issued a report “The Donaldson Report” that sanctioned the creation of human cloned embryos for research. The publication of the report resulted in remarks from

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the Council of Europe that included the following: “the UK has now left the European community in terms of moral values” referring to the 1998 Convention on Human Rights and Biomedicine: Additional Protocol on the Prohibition of Cloning Humans. In 2005, the United Nations attempted to pass an international ban on all types of human cloning, but opposition from the United States and its allies resulted in the passing of a non-binding declaration to ban human cloning, and the subsequent repositioning by the UN in 2007 to promote a ban on reproductive human cloning only. Meanwhile, researchers in industry and those in academia using private funding have made progress on human cloning research as can be seen from the series of short news pieces spanning 2002-2011. Note that in the blog by Elgin some common terms are revisited such as teratoma and epigenetic memory. The Dunn article is a feature article about a family and a biotech company’s attempt to “clone” some cells from their diseased son to treat his disease.

In Class Activity: Cloning

In Class Video: Connie Chung Cloning Video Clip.

Reading: (25 pages)

1. Dunn, K. 2002. Cloning Trevor. Atlantic Monthly, 289(6): 31-48.
<http://www.theatlantic.com/issues/2002/06/dunn.htm>
2. Vogelstein, B. et al. Feb 12, 2002. Please don’t call it cloning. Science. 295(5558):1237.
<http://www.sciencemag.org/content/295/5558/1237> . This article suggests new nomenclature for stem cell research that does not invoke the concept of reproductive clones.
3. O’Mathuna, D. 2002. What to call human cloning. EMBO Reports 3 (6): 502-505. This article is in response to the Vogelstein et al. article and states that ethical issues can not be skirted by changing the vocabulary. <http://www.nature.com/embor/journal/v3/n6/pdf/embor136.pdf>
4. French et al. Feb 26, 2008. Development of cloned blastocysts following somatic cell nuclear transfer with adult fibroblasts. Stem Cells. 2: 485-93. READ ABSTRACT Only.
<http://www.ncbi.nlm.nih.gov/pubmed/18202077>
5. Cibelli. October 2, 2009. The human egg is back. Cell Stem Cell. 5:345-346. Preview of the Tachibana et al work of ST transfer fusion for cloning of primates.
http://pdn.sciencedirect.com/science?_ob=MiamiImageURL&_cid=274143&_user=10&_pii=S1934590909004548&_check=y&_coverDate=2009-10-02&_view=c&_gw=y&_wchp=dGLzVIB-zSkzV&_md5=e3904f5f665b90ff0790fb3400364d82/1-s2.0-S1934590909004548-main.pdf
6. Dolgin, E. Oct 5, 2011. First stem cells created from cloned human embryos- but they’re triploid. Nature Medicine.
http://blogs.nature.com/spoonful/2011/10/first_stem_cells_created_from.html
7. **Optional:** Baker, Monya. Double-locking against gene expression in embryonic stem cells. Nature Highlight. The Niche, Nature Stem Cell Blog. Nov 4, 2008.

March 13-15 Spring Break

March 20 Chimeras, Hybrids and Cybrids

Though most people find the idea of a human animal merger at the cell or organismal level “creepy” or “yucky,” some countries have moved forward with such research in hopes of better understanding the intricate processes involved with cloning and embryogenesis; though all countries prohibit the implantation of such a creation in the human uterus, Canada, the UK, Japan allow for some hybrid creations, while China and Germany explicitly forbid it. Where does the US stand on this? Perhaps what is most interesting in this realm, is that if a state forbids chimeras, they essentially block the ability to

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prove that a cell can truly behave as a stem cell as is routinely done in teratoma formation of human cells in post blastocyst of rodent--- did someone miss a science class or is no one paying attention?

In Class Video: Vincent on Nip Tuck . Nip/Tuck Episode 5.04. Dawn Budge II . 3:07 - 5:33.

http://www.youtube.com/watch?v=YyqLH4_EF2Q . This was done in real life wit bovine cartilage cells on a rodent, and the plastic surgery context is a reminder of Illinois Comptroller Dan Hynes' 2005 proposal for a 6% tax on elective cosmetic surgery to repay state bonds dedicated to stem cell research.

In Class Video: Christine O'Donnell on Fox Bill O Reilly 2007. Mice with Human Brains.

http://www.youtube.com/watch?v=FqOV_eqbkwE

Readings:

1. Scott, C. September 5, 2007. The Chimeras are Coming (uh wait, they've arrived). The Stem Cell Blog. <http://thestemcellblog.com/2007/09/05/the-chimeras-are-coming-uh-wait-theyve-arrived/>
2. Scott, C. Sept 6, 2007. The difference between cybrids and chimeras. Stem Cell Blog <http://thestemcellblog.com/2007/09/06/differences-between-cybrids-and-chimeras/>
3. Bonner, J. July 13, 2006. Human stem cells can contribute to a developing mouse embryo, despite evolutionary differences. Rockefeller University Newswire. <http://newswire.rockefeller.edu/index.php?page=engine&id=510>
4. Baylis, F. 2008. Animal eggs for stem cell research: A path not work taking. American Journal of Bioethics. 8(12): 18-32. Target article for the short two pages responses and comments below by Chapman et al and Gerrick. TBD
5. Chapman, A. 2008. Unscrambling the eggs: Cybrid research through an embryonic stem cell research oversight committee (ESCRO) lens. American Journal of Bioethics. 8(12): 44-46.
6. Gerrek, M. 2008. Who really causes the lady to vanish? American Journal of Bioethics. 8(12): 46-48.
7. **Optional** NYSTEM May 3 2010 or the 9_27_10 Meeting Minutes.
8. **Optional** . Baylis, F. 2009. The HFEA Public Consultation Process on Hybrids and Chimeras: Informed, Effective, and Meaningful? Kennedy Institute of Ethics Journal. 19(1):41-62 .
9. **Optional.** Skloot, R. 2010. Chapter 18: The Strangest Hybrid. *In The Immortal Life of Henrietta Lacks.*

March 22 *****QUIZ ***** (5% of your grade)

*****REST of SYLLABUS TO BE ADJUSTED BASED on FIRST HALF and CLASS PROGRESS*****

March 27 Female Bodies as Sources of Stem Cells (4 days)

Guest Discussants: Ann Snitow, Professor of Literature and Gender Studies

Chelsea Briganti, Alumna of Parsons Product Design, Mademoicell

<http://www.thewayweseetheworld.com/>

This collection of readings span the important role that female biology plays in the field of stem cell research and how feminist action can protect a woman's right to make informed choices about how she might want her cells to be used in stem cell research. Women's bodies provide two unique cell types necessary for stem cell research: the egg and menstrual blood cells. But who gets to decide how these cells be obtained, regulated, marketed? Are there ethical concerns about equity, diversity, access, and exploitation? Why has NY state adopted legislation that goes against all other states and international norms regarding payment for eggs destined for research? How do feminist critiques of cell biology resurface here as discussions about power and authority play out? The readings span the benefits and

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risks associated with egg “donation”, the laws and practices currently in place for egg retrieval for research purposes, and the issues surrounding the private and public sector management of both payment for these cell sources as well regulation of access to the potential stem cells made from these sources. Please note the timeline of the publications for each subtopic as the field is moving fast with many different lenses through which the practice is being scrutinized.

The Egg and the Womb: Sources of Stem Cells

Emily Martin in her famous essay “The Egg and the Sperm” published in 1991 challenges the status quo of what is normally considered the “weaker” sex. She writes: “...by extolling the female cycle as a productive enterprise, menstruation must necessarily be viewed as failure. Medical texts describe menstruation as “debris” of the uterine lining, the result of necrosis, or death of a tissue. The descriptions imply a system that has gone awry, making products of no use, not to specification, unsalable, wasted, scrap. An illustration in widely used medical text shows menstruation as a chaotic disintegration of form, complementing the many texts that describe it as a ‘ceasing’, ‘dying’, ‘losing’, ‘denuding’, and ‘expelling.’ “...biologists have lent their support to the notion that the human female, beginning with egg, is congenitally more dependent than the male.” (Martin, E. , 1991). More recent work using ovaries removed from individuals undergoing gender reassignment reveals that ovarian stem cells could allow the generation of oocytes in vitro and harkens back to the arguments brought forth by the case *Flynn vs. Holder*; that tissues which harbor stem cells should be considered regenerative and that as new technologies emerge we should revisit the notion of placing these tissues under the jurisdiction of the National Organ Transplant Act and instead allow for payment for such tissues to those that are fully informed and consent to their removal.

In Class Video : To review Midterm Exam and IVF, Clones, and Parthenotes. Vidali, A. April 3 2011. IVF Procedure. A Simple Explanation of the In Vitro Fertilization Cycle.

<http://www.youtube.com/watch?v=7oNg6Lm4ZJ4>

In class Video : Dolgin, E. Feb 26, 2012. VIDEO: Stem cell discovery puts women’s reproduction on fertile ground. Nature. Medicine. 5 minutes video Narrated by Rebecca Hersher and animation and artwork by Katherine Vacari. MacMillan Publishers. <http://blogs.nature.com/spoonful/2012/02/video-stem-cell-discovery-puts-women’s-reproduction-on-fertile-grounds.html> ovaries were secured from individuals undergoing gender reassignment surgery; are eggs are regenerative... reminder of Flynn and Holder. Also has the heuristic with the detection and antibody fish, an trace.

In Class Video: Briganti, Chelsea. 2010. Mademoicell Design Process. Stem Cells from Menstrual Cells

http://a.parsons.edu/%7Etraviss/koln/Chelsea_Briganti_Mademoicell.mov

In Class Video: The Resident. 2010. Menstrual Stem Cells. YouTube.

<http://www.youtube.com/watch?v=m7wVPINUVWc>

Readings: Eggs, Sperm, and Menstrual Blood

1. Reynolds, Jesse. Jan 23, 2009. NY Stem Cell Research Nears Dangerous Line. Newsday.com. on the Genetics and Society News Feed.
2. Schatten G, Schatten H. 1983. The energetic egg. *The Sciences* 23(5): 28–35.
3. Almeling, Rene. 2009. Gender and the Value of Bodily Goods: Commodification in Egg and Sperm Donation. *Law and Contemporary Problems*. 72 (3): 37-58.

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4. Briganti, Chelsea. 2010. Mademoicell Design Process. Stem Cells from Menstrual Cells
http://a.parsons.edu/%7Etraviss/koln/Chelsea_Briganti_Mademoicell.mov

Optional Readings : Umbilical Cord, Menstrual Blood, and Breasts

5. Teisha Rowland. March 27, 2009. Stem Cells Discovered in Menstrual Blood: Endometrial Regenerative Stem Cells. Allthingsstemcell.com.
<http://www.allthingsstemcell.com/2009/03/endometrial-regenerative-stem-cells/>
6. Begley, S. All Natural: Why **Breasts** Are the Key to Regenerative Medicine. Wired Magazine .Oct 2010. http://www.wired.com/magazine/2010/10/ff_futureofbreasts/
7. Robbins, S. Feb 28, 2009. New Developments in Umbilical Cord Blood Technologies.; Consolidation of U.S. Family Banks. Lifes Sciences World.com
<http://www.lifesciencesworld.com/news/view/97403>

Mar 29 Egg Retrieval: The Risks and the Benefits

In Class Video OHSS.

1. In Lines that Divide (Calla Papademas 7th clip) <http://linesthatdivide.com/> Payment for Oocytes
In Lines that Divide (Kierstead 5th clip) <http://linesthatdivide.com/>
2. Eurostemcell. Dolly and Beyond. Clip from 3:27-4:40 UK view)
<http://www.eurostemcell.org/stem-cell-videos-and-films#conversations>

Readings:

1. Stein instead of Fiore R. and K. Hirsch. Oocytes for research: Reevaluating the risks and compensation. American Journal of Bioethics. 11 (9): 42-43. (NY) (CDC; healthy Phase I)
2. Bamford, R. 2011: Reconsidering risk to women: Oocyte donation for human embryonic stem cell research, The American Journal of Bioethics, 11(9): 37-39. (need more data; parallel payment)
3. Batzer, F. & J Daar J. 2011: Harmony and compensation for oocyte providers. The American Journal of Bioethics 11(9):39-41. (new hormone protocol to reduce risk; Pre screen risk pool)
4. Linda Giudice, Eileen Santa, and Robert Pool, eds, National Research Council, EXECUTIVE SUMMARY of "Assessing the Medical Risks of Human Oocyte Donation for Stem Cell Research: Workshop Report," National Academies Press, 2007. This report is the result of a contract put forward by the CIRM (Prop 71) to NAS to identify what is known about risk, what needs to be known, and what can be done to minimize risk via a Committee on Assessing the Medical Risks of Human Oocyte Donation for SCR and workshop on Sept 28, 2006 in San Francisco. (7 pages). Please scroll through the entire document to learn about membership and expertise on this committee, both the exec summary and the preface.
5. Pearson. 2006. Health effects of egg donation may take decades to emerge. Nature. 442(7103): 607-608.
6. Introduction of Case Study on NY STATE- Stake Holder Symposium one week from today.

ADD IKEMOTO

Apr 3 Commodification of Female Bodies

Readings:

1. Johnston, Josephine. 2006. Paying egg donors: Exploring the arguments. Hastings Center Report. 36 (1):28-31. (2 pages) (Korea)
2. McLeod, C. 2007. "For Dignity or Money: Feminists on the Commodification of Women's Reproductive Labour" In The Oxford Handbook of Bioethics, 258-281. (25p)

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3. Papadimos, T. and A. Papadimos. 2004. The student and the ovum: The lack of autonomy and informed consent in trading genes for tuition. *Reproductive Biology and Endocrinology*. 2:56.
(READ ABSTRACT)
4. Nahman, Michal. 2008. Nodes of desire. Romanian egg sellers, 'dignity' and feminist alliances in transnational ova exchanges. *European Journal of Women's Studies*. 15(2): 65-82.
5. Stein, A. L. (2011). The conundrum of oocyte donation, human research, OHSS, and ethics. *The American Journal of Bioethics: AJOB*, 11(9), 35-37. (cites Levine and Skloot)
6. Klitzman, R. and Mark V. Sauer. March 20, 2009. Payment of egg donors in stem cell research in the USA. *Reproductive BioMedicine Online*. 18(5): 603-608. (identify the sections of this paper in which Klitzman acknowledges procedural justice, distributive justice)
7. Other waldy Waldby, C. 2008. Oocyte Markets: Women's reproductive work in embryonic stem cell research. *New Genetics and Society*. 27 91):19-31 .

Optional:

1. Carney, Scott. (Sept 1, 2010). Unpacking the Global Human Egg Trade. *Fast Company*. *Genetics and Society Site*. (9 pages) <http://www.geneticsandsociety.org/article.php?id=5342>

****** April 3rd The New York Stem Cell Foundation conference SCR and Cardiac Disease Times Warner Center 6-8pm** <http://www.nyscf.org/events/upcoming-events/item/701-parkinson's-disease-how-stem-cell-research-will-make-a-difference>

Apr 5 New York State Compensation for Oocytes

****CASE #2 Oocytes: Gifts and Commodities**

Readings

1. ESSCB. June 11, 2009. "Statement of the Empire State Stem Cell Board on the Compensation of Oocyte Donors". (2pages)
http://stemcell.ny.gov/docs/ESSCB_Statement_on_Compensation_of_Oocyte_Donors.pdf
2. Jack Fowler. June 13, 2008. "Pro-Life Dem Lawmaker Blasts Embryonic Stem Cell Research Plan,," (1 Page). This is a blog post on The Corner from the National Review Online and it pastes verbatim the letter from Senator Ruben Diaz to Judy Doesschate JD of ESSCB
3. O'Reilly, K. July 27, 2009. New York OKs Paying Women Who Donate Eggs for Research. *AMN News.com* (2pages) <http://www.ama-assn.org/amednews/2009/07/27/prsc0727.htm> .
4. Crowley, C. Oct 15 2009. Abortion foes challenge pay for egg donors. *Timesunion.com*. (1page) <http://www.timesunion.com/local/article/Abortion-foes-challenge-pay-for-egg-donors-552897.php> .
5. Eggsploration Photos and Raves. *Feminists Who Choose Life*.
http://www.feministschoosinglife.org/eggsploration.php#comments_from_samuel_gorovitz
Please be sure to read the entire post past the photos and note the two sets of comments from ESSCB board members and the tone of the interview.
6. Hamilton, J. 2000. What are the costs? *Stanford Magazine*. Nov/Dec.
<http://www.stanfordalumni.org/news/magazine/2000/novdec/articles/eggdonor.html>

Apr 10 Religious, Moral, and Political Philosophies Concerning ESCR

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Most of the reading here address the plurality of views on stem cells research both from a philosophical and moral view as well as cultural and religious view. If you are interested in reading more in this area, let me know or visit the book list posted under Syllabus. The Nickel piece is an interesting one, because it asks us to consider the possibility of an impasse and in particular when current language is vague or ambiguous, such as the Dickey Wicker Amendment. What then when we agree to disagree? What are the consequences, procedures for the future? Who gets to decide and by what means can the opposing parties influence others' views. The two sets of NYSTEM meeting minutes on the funding of ESCR reflect Nickel's point; note how the diverse members of this committee navigate the discussion. The Walters article is a very rich and detailed article that extends this state and local level discussion to the global and multicultural sphere. How is decision making influenced by religion or culture? How do different groups go about making statements with respect to ESCR? Walters breaks it down into 6 main points of decision that span the moral status of the embryo to the use of human tissue in research.

In Class Video:

1. **Revisit Savior Siblings** Religion & Ethics Weekly. Embryonic Stem Cell Controversy. April 2, 2010. (7min) <http://www.pbs.org/wnet/religionandethics/episodes/april-2-2010/embryonic-stem-cell-controversy/5995/>
2. Moral Status and When Life Begins (Hurlbut/Kierstead 6th clip) <http://linesthatdivide.com/>
3. Alta Charo at the Milken Institute Global Conference. May 28th 2009. Faster Cures. (13:50-20:00) (Tech as progress;ESC vs ASC; complicity fed funding) <http://www.milkeninstitute.org/events/gcprogram.taf?function=detail&EvID=1924&eventid=GC09>
4. EuroStemCell. Conversations: Ethics, science, and stem cells. (2:33) <http://www.eurostemcell.org/stem-cell-videos-and-films#conversations>

Readings

1. Nickel, P. 2008. Ethical issues in Human Embryonic Stem Cell Research. *In* Fundamentals of the Stem Cell Debate. University of California Press. 62- 78.
2. NYSTEM Ethics Committee Meetings transcripts Meeting Minutes of the April 2008 Empire Ethics Committee page 3- 9, but look at the profile of the members on page 1. http://stemcell.ny.gov/ethics/minutes_fundingcomm_04_01_2008.pdf
3. NYSTEM Ethics Committee Meetings transcripts Meeting Minutes of the May 2008 Empire Ethics Committee (7 pages). http://stemcell.ny.gov/ethics/minutes_ethicscomm_05_13_2008.pdf
4. Walters, L. 2004. Human embryonic stem cell research: An intercultural perspective. *The Kennedy Institute of Ethics Journal* 14(1): 3-38
5. Freddoso, David. Feb 6, 2007. Homilist Names Names. *National Catholic Register*. <http://hfs.detmich.com/mcdonnell/mcdonnellncr.html>

April 12: Advocacy and Policy: Birth, Death, and Clones

*** Case #2 Oocytes Essay Due

In Class Activity Clones

On March 9, 2009 President Obama signed an executive order to expand SCR, and in the press conference and signing he makes note of the work of powerful advocates; patients, scientists, etc. (See Solomon and NYSCF). The President also claimed that he was pleased that policy is being based on fact not ideology. Given our last set of readings, how does that message sit with you? What most people don't know is that less than an hour afterward he also signed the Dickey Wicker Rider. The Fossett policy brief reminds us, as Nickel did, that the ambiguity in the Dickey Wicker Amendment has led to interpretations that constrain ESCR. Obama also left the guidelines for research to be determined by

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the NIH (recall the first week's readings on the National Research Foundation proposed by Vannevar Bush and the one here by Strode). The Anonymous news report on the hold up of Bush era stem cell lines under the new NIH Guidelines is emblematic of the hurdles that stem cell researchers face despite the new executive order; no destruction of embryos, and no clones. The recent decision to deny 47 stem cell lines from diseased IVF embryos reported by Wadman illustrates some of the ethical oversight mentioned earlier in the course during the HeLa case study, while the Kahn and Mastroianni piece presents some of the challenges of moving across different institutions to create a stem cell donor. Though the NIH guidelines are meant to "follow" the oocyte donor, they do little to address the continuum mentioned here. The chapter by Gilkey et al. illuminates the ways in which advocacy has worked in the past, and how it might need to be restructured given the intricacies of SCR. Dolgin caps off the set, and might seem like an outlier, but consider the need for Obama to sign the executive order despite moral outcry and an economic crisis. The StemRegenin molecule, is just one of the "sustaining" products that Dolgin mentions in her piece.

In Class Videos

1. **Lines that Divide.** <http://linesthatdivide.com/> (1st clip/Hurlbut/ Lahl, 2nd clip/Reeve, 3rd clip OHSS)
2. **Connie Chung Cloning Couple 2001.**
3. **NAS 2001. C- Span**
4. Excerpt from My Sister's Keeper TV Spot #1 <http://www.mysisterskeepermovie.com/#video>
5. Religion & Ethics Weekly. Informed Consent and Medical Research June 25, 2010 <http://www.pbs.org/wnet/religionandethics/episodes/june-25-2010/informed-consent-and-medical-research/6545/>
6. **Scientists and Engineers of America.** Mach 9, 2009. Release with links to Obama video, breakdown of the executive order and background information. Notice the mention of members of NYSTEM, Degette, and members of the Reeve family. <http://sharp.sefora.org/issues/executive-order-on-stem-cell-research/>

Readings

1. Strode, Tom. March 25, 2009. Ethicists: Obama misrepresented his own stem cell order during a press conference. Baptist Press. (2 pages) <http://www.bpnews.net/bpnews.asp?id=30134>
2. Anonymous. 2010. Stem Cell Funding In Sight. Nature. 464:967. (1 page).
3. Kahn and Mastroianni. Mar 2004. Creating a stem cell donor: A case study in reproductive genetics. Kennedy Institute of Ethics Journal. 14 (1);81-96.
4. Wadman, Meredith. June 15, 2010. Disease cells fail to win approval. NatureNews.com. 852: <http://www.nature.com/news/2010/100615/full/465852a.html>
5. Gilkey, Melissa, Earp, Jo Anne, and Elizabeth French. 2007. What is Patient Advocacy? Patient Advocacy for Health Care Quality : Strategies for Achieving Patient-Centered Care. Sudbury, Mass.: Jones and Bartlett Publishers.
6. Dolgin, E. Feb 2009. Profiting from pluripotency. The Scientist. 60-61.
7. Stemregenin Molecule for Sale. <http://www.cellagentech.com/product/SR1.html>

Please Visit this Link University of Michigan, Stem Cell Explained and Explored. Use the Tabs at top to explore Stem Cell Defined, Nuclear Transfer ,and Drug Testing. http://ns.umich.edu/stemcells/022706_TabA.html

April 17: Disability and Advocacy

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Disability is something that affects every human at some point in their lives, but for many disability will occur later in life. Where does our knowledge of disability come from? What information might we need to understand how people live with disabilities? This set of readings traces the history of society's view of disability using a medical model. Wasserman and Asch challenge this view and ask us to apply a social model to avoid injustices to those that live with disabilities (Wasserman and Asch). Both the Brignall articles and the articles on the use of language (Linton and Baynton) reflect on the history of disability and eugenics and illustrate a shift from patient advocacy (medicalized view) to disability rights. The Mairs, Hockenberry and Degette Chapter on Franny, present a range of lives of people who have Type I diabetes, spinal cord injury, and other disabilities discussed as prospects for treatment and cure through stem cell research. Do people attribute problems to their physical characteristics, to the social environment, or to the interaction of body and environment? How different are the frustrations of the people with disabilities from the frustrations of your own lives? It is notable that in 2009, Press Secretary Gibbs responded to a reporter that the Stem Cell Research Executive Order was signed as part of a larger effort of health care reform, but given the video below and the comments by the Secretary of Health and Human Services Kathleen Sebelius do you agree with Gibbs' reasoning?

In Class Video: 20th Anniversary of the ADA . 12:00-15:00 and 24- 31:00 minutes

<http://www.youtube.com/watch?v=r3ok5abPhw0>

In Class Video: Video Advance Clip of " Fixed" by Regan Brashear <http://fixedthemovie.com/watch-trailer> . <http://www.kickstarter.com/projects/394281483/fixd-the-science-fiction-of-human-enhancement-doc>

1. Anonymous. What is Health? The Ability to Adapt. The Lancet (1 page)
2. Brignell, Victoria. Dec 10, 2010. The Eugenics Movement Britain wants to Forget. New Statesman. <http://www.newstatesman.com/society/2010/12/disabled-america-immigration> .(audio available at website). A three part series to mark disability history month. (2 ½ pages)
3. Brignell, Victoria. Dec 10, 2010. When America Believed in Eugenics. NewStatesman. <http://www.newstatesman.com/society/2010/12/disabled-america-immigration> .(audio available at website). This is the second in Brignall's series to mark disability history month The Eugenics movement Britain wants to forget" and "When the Disabled Were Segregated" were the first and third in this series. Note that Alexis Carrel is mentioned here... Alexis Carrel's Beating Heart. (3 ½ pages)
4. Wasserman and Asch. People with Disabilities. *In* The International Encyclopedia of Ethics. <http://www.hughlafollette.com/IEE.htm> . A 10-page primer compares the medical and social models of disability and the ways in which they succeed and/or fail to achieve social justice.
5. Linton, Simi. " Reassigning Meaning" In Claiming Disability. Knowledge and Identity. New York University Press. 1998 p 8-17 as seen on the Disability History Museum . <http://www.disabilitymuseum.org/dhm/edu/essay.html?id=21> (4 pages)
6. Baynton, Douglas. 2001. "Language Matters:Handicapping an Affliction" in this Radio Series titled Beyond Affliction on NPR by Laurie Block, on the Disability History Museum. <http://www.disabilitymuseum.org/dhm/edu/essay.html?id=30> (1 page)

If you can manage to read all the articles below wonderful, but if you must choose, select from one of these categories: Hockenberry (Spinal-cord injury, design, and ADA rules); Mairs (Glamour magazine ethnography of women with disabilities), or Hahn and Belt (research article by two politics professors on a range of views from the Activist Group ADAPT via qualitative data on cure or care approaches to disability) or Kay which focuses on the notion of body image in women with diabetes.

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7. Hockenberry, John. October 11, 2006. The Re-education of Michael Graves. Metropolis Mag.com. Source: <http://www.metropolismag.com/story/20061011/the-re-education-of-michael-graves> (4 pages)
8. Hockenberry, J. June 29, 1999. Disability Games. The New York Times. [http://ada.ky.gov/articles.htm#\"Disability Games\"](http://ada.ky.gov/articles.htm#\) (1page)
9. Mairs, N. Young and Disabled. In *Waist High in the World a Life Among the Disabled*. Beacon Press. 1997. (10 small pages from a book)
10. Hahn, H.D and Todd D. Belt. 2004. Disability identity and attitudes toward cure in a sample of disabled activists. *Journal of Health and Social Behaviour*. 45: 451-264. But skim the statistical data and many pages are references.
11. Kay C. et al. 2009. An exploration of the experiences of young women living with type 1 Diabetes. *Journal of Health Psychology*. 14 : 242- 250.

April 19: Disability and Advocacy

In this session the readings take on the question of treatment, cure, or social solutions to issues of disability. Note that Davis picks up on the role that higher education should play in the lives of those that live with disability and asks use to include disability in the context of conversations about diversity in higher education. Shakespeare appears to be striving for a balanced perspective, endorsing neither a “medicalized” tragedy approach, nor an entirely social approach to issues of disability. But he differentiates between what some people call “static” impairments or disabilities, such as spinal-cord injury, and what some refer to as “chronic illnesses” like Type I diabetes. He thinks, or appears to think, that the former may be more hostile to cure than the latter; does Mairs’ report back him up? He also appears to think that the stage in life at which someone acquires an impairment (early in childhood or adolescence versus later) can make a difference in how people make sense of disability. Note that this view may be in tension with his view about static versus chronic and progressive impairments. Contrast Shakespeare with Johnson’s excerpt from *Make Them Go Away*. What does Johnson add, if anything, to Shakespeare’s account? According to Johnson, Reeve does not represent the views of many people with disabilities and does damage to the hopes and aspirations of people with disabilities trying to live their lives. Weiner’s short piece on the end of the Jerry Lewis telethons (3.3) is in the same vein.

1. Davis, Lennard. Sept 25, 2011. Why is Disability Missing from the Discourse on Diversity. *The Chronicle of Higher Education*. (3 pages)
2. Adams, R. November 6, 2011. Bring down the Barriers. - Seen and Unseen. <http://chronicle.com/article/Bring-Down-the-Barriers-Seen/129648/>
3. Johnson, Mary. 2003. “Introduction” and “Chapter 1 Clint Eastwood and Christopher Reeve.” *In Make Them Go Away: Clint Eastwood, Christopher Reeve and The Case Against Disability Rights*. The Advocado Press. Louisville. p. i-10. <http://www.makethemgoaway.com/>
4. Shakespeare, Tom. 2006. “Just Around the Corner” *In Disability Rights and Wrongs*. Routledge Press. NY. 103-117.
5. TIMELINES
 - a. Smithsonian Timeline. Interactive Timeline with Audio, video, and text describing the items in the exhibit. Video of Senator Tom Harkin sign language address to Congress for the ADA 1990. <http://americanhistory.si.edu/disabilityrights/welcome.html>
 - b. Museum of Disability and People Inc. Has a neat interactive site of History broken up by NY state and general. Has Hepatitis Experiment at Willowbrook on NY Timeline. And Architectural Barriers Act in 1976 for the Clint Eastwood Piece <http://www.museumofdisability.org/index.asp>

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April 24 Hope and Hype: Adult Stem Cells and Clinical Trials

As public sector funding is subject to politics, the private sector has taken the lead. In some cases industry and non-profits are working closely with the FDA, and other arms of government in a coordinated front to advance SCR. In other cases, the private sector has branched out on its own with some companies trying to uphold standard practices of scientific research while others appear to be unwilling to abide by regulatory processes. Still, in other situations the lines are blurry, with academic institutes funded by private and public dollars. The first human embryonic stem cell (hESC) trials in the U.S. began in 2010 with FDA approval by two leading companies: Geron and Advanced Cell Technology. Each company has chosen very different kinds of targets; Geron is trying to treat acute spinal cord injuries, and ACT is looking to treat a degenerative disorder of the eye. Much to everyone's surprise the Geron trial partly funded by the CIRM, was abandoned in late 2011 due to financial constraints. Meanwhile, China and South Korea have begun FDA approved trials for arthritis and spinal cord injury. Back in the U.S. stem cell sources have come from unlikely sources such as adipose tissue which can be retrieved from liposuction, and Cytori Therapeutics and others are have begun human clinical trials with adipose regenerative stem cells (ADSCs) abroad to test the regenerative capacity of these cells in breast tissue reconstruction, breast enhancement, and cardiac tissue repair. These cells are not required to undergo FDA evaluation, but rather Good Manufacturing Practices (GMP). Given the range of activities, some regulated and others not, watchdog groups are on the lookout for rogue organizations that falsely claim to have stem cell cures and commit harmful practices that exploit the vulnerable. The ISSCR attempts to "protect" the public against such acts via the Closer Look at Stem Cells Treatments website. Do you agree with Shanks criticism here? Might there be another interpretation?

In Class Videos and Websites :

1. **60 Minutes 21st Century Snake Oil** Sept. 12, 2010 : Part 1 Patients : 13:23 minutes
<http://www.cbsnews.com/video/watch/?id=6859188n&tag=mncol;lst;3>
2. **60 Minutes 21st Century Snake Oil** Sept. 12, 2010 : Part 2 Reveal : 12 minutes
<http://www.cbsnews.com/video/watch/?id=6859211n&tag=segmentExtraScroller;housing>
3. **60 minutes. Stem Cell Fraud.** Jan 8, 2012. 15 minutes
http://www.cbsnews.com/8301-18560_162-57354695/stem-cell-fraud-a-60-minutes-investigation/
4. **ISSCR. A Closer Look at Stem Cells WatchDog Site**
<http://www.closerlookatstemcells.org//AM/Template.cfm?Section=Home>
5. **Elizabeth Cohen. Stem Cell Trials to Begin. CNN.** 2 minutes
<http://www.youtube.com/watch?v=MaygWPGkPn4&feature=related>
6. **Alta Charo at the Milken Institute Global Conference.** May 28th 2009. Faster Cures. (28:50-31:30) (Hype)
<http://www.milkeninstitute.org/events/gcprogram.taf?function=detail&EvID=1924&eventid=GC09>
7. **UC Irvine Hans Keirstead. Stem Cells Restore Mobility in Neck Injured Rats (UC Irvine)**
<http://www.youtube.com/watch?v=0g908rplos8>
8. **FDA Approves Use of Stem Cells in Humans Again.** Nov 22, 2010. Daily Conversation. Two young students reviewing the new clinical trial approval for Advanced Cell Technology. Reviews proof of concept and reviews immunosuppressed regions of the body.
http://www.youtube.com/watch?v=gxdd9Cpbimw&feature=watch_response

Readings: (if you are short on time, read the Cytori and Korea Begley Article)

Geron:

1. Associated Press. Dec 2004. Stem Cells Help Paralyzed Rats Walk. (2 pages)

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2. Woodbury, M.A. 2009. Hans Keirstead Can Make Mice Walk Again. Esquire.com. (1p)
3. Pollack, Andrew. January 23, 2009. F.D.A. Approves a Stem Cell Trial. (2 pages)
<http://www.nytimes.com/2009/01/23/business/23stem.html> (has Kessler commenting and Geron trial)
4. Varughese, A, Dec 12 , 2011. Abandoning the Stem Cell Clinical Trial Ship. Biotechniques.
<http://www.biotechniques.com/news/Abandoning-the-Stem-Cell-Clinical-Trial-SHIP/biotechniques-324708.html?autnID=308862> (4 pages)
5. Glance at Stem Cell Report the CIRM Newsletter.
<http://californiastemcellreport.blogspot.com/2012/02/25-million-cautionary-tale-cirm-and.html>
6. Shanks, Pete. Aug 4, 2010. Stem Cell Education and Hype. Biopolitical Times.
<http://www.biopoliticaltimes.org/article.php?id=5309> (1 page)

ACT

7. Conner, Steve. Nov 20, 2009. Stem Cells: The First Human Trial. The Independent.
<http://www.independent.co.uk/news/science/stem-cells-the-first-human-trial-1824099.html> (2 pages) (ACT Retinal trial)

Cytori and Korea

8. Begley, S. (2010). All Natural: Why breasts are the answer to regenerative medicine. Wired. 18(11), 148-155, 188-190. http://www.wired.com/magazine/2010/10/ff_futureofbreasts/all/1
9. **In Class Activity:**
 - a. Distribute and Read Gimble et. al. 2011. Taking stem cells beyond discovery: A Milestone in the reporting of regulatory requirements for cell therapy. Stem Cells and Development. 20 (8): 1295-1296.
 - b. Show and read with class the abstract of Ra, J.C. et al. 2011. Safety of intravenous infusion of human tissue derived mesenchymal stem cells in animals and humans. Stem Cells and Development. 20(8): 1297-1308.

April 26: Private Sector SCR: Adult Stem Cell Advances or Conspiracy of Hype?

HW #4 Terra Incognita Film Review/ Critique Essay Due (please see questions posted)

Shortly after Obama's executive order was put in place, two interesting injunctions emerged both in the context of adult stem cells (ASCs); in one case two ASC stem cell researchers sued the government's NIH for providing funding for the study of existing ESCs (Sherley vs. Sebelius) and another brought forth by the government's FDA against privately funded Regenerative Sciences Company for using autologous ASC to treat knee disabilities. Both injunctions reveal that the science is moving fast- perhaps faster than legislation and regulatory processes resulting in a series of litigations. Note that in the James review, there is foresight about the Dickey Wicker loophole as many of your other readings have indicated as well; Gearhar's comments are astute and remind us of the Degette-Castle Bill. The FDA injunction echoes some of the work of the international watchdog ISSCR " A Closer Look at Stem Cell Treatments" <http://www.closerlookatstemcells.org//AM/Template.cfm?Section=Home> and the Denoon piece casts the net to the European Union.

In Class Videos:

1. **Alta Charo** at the Milken Institute Global Conference. May 28th 2009. Faster Cures. (47:00 - 49:00) (FDA and SCR)
<http://www.milkeninstitute.org/events/gcprogram.taf?function=detail&EvID=1924&eventid=GC09>
2. **Video and Story:** Young, Sandra. Aug 24, 2010. Jeffrey Toobin: Government Will Appeal Injunction Against Stem Cell Funding. CNN:
<http://www.cnn.com/2010/US/08/24/stem.cell.funding/index.html>

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3. RIRC Federal Injunction Video <http://www.reeve.uci.edu/news-stem-cell-ban-video.html>

Readings: Normally Split into two days, FDA injunction and then patents

1. Goldfarb, N. 2011. *Sherley vs Sebelius*. Regenerative Medicine. 6 (6Suppl): 104-105.
2. Boyer, Peter. Sept 6, 2010. The Covenant. The New Yorker. (11 pages)
http://www.newyorker.com/reporting/2010/09/06/100906fa_fact_boyer?printable=true#ixzz0yH8KzuLw
3. Denoon, A. 2011. *Brustle vs. Greenpeace*. Regenerative Medicine 6 (6Suppl): 85-87.
4. Today's Stem Cell Research.(2005). "US Patent Office Rejects PharmaStem Cord Blood Stem Cell Patents." Online. Today's Stem Cell Research. March 1, 2005.This is an important case as it sets the precedent for patents on technologies with broad reach.
<http://www.stemnews.com/archives/000430.html> update link
5. James, Frank. August 23, 2010. U.S. Judge Stops Federally Funded Embryonic Stem Cell Research. NPR.com. <http://www.npr.org/blogs/thetwo-way/2010/08/23/129384172/u-s-judge-stops-federally-funded-embryonic-stem-cell-research> NOTE the update section and reference to Gearhart.
6. Cyranoski , D. Sept 22, 2011. Texas Prepares Fight for Stem Cells. Nature. 477:377-378.
7. Blevins, Jason. Aug 20, 2010. FDA Slaps Bloomfield Stem Cell Clinic with Injunction, Halting Pain Treatment. Denver Post. http://www.denverpost.com/news/ci_15834497 (1page)
8. Freeman, L. March 11, 2011. Bonita doctor under restricted license schedules Monday stem cell seminar. Naplesnews.com. (1/2 page)
<http://www.naplesnews.com/news/2011/mar/11/Zannos-Grekos-stem-cell-Regenocyte-Therapeutic/>
9. Anonymous. Oct 7, 2010. Stem-cell laws in China fall short. Nature. 467:633.
10. Ledford, H. June 30 2011. Stem-cell scientists grapple with clinics. Nature 474:550.
11. ESPN2. Jan 23, 2012. Outside the Lines. The Stem Cell Treatment Debate. Video depicting sports stars going abroad to enhance their output or heal more quickly; Centeno and Andrews provide opportunities in Cayman Islands and South Korea; FDA injunction; microfracture in vivo technique. 10minutes video, and 10 minutes panel with Arthur Kaplan (bioethicist), sports star, and physician who performed stem cell transplant. 20 minutes in total.
<http://www.youtube.com/watch?v= kWrwKy33Xs>

Optional

12. Centano, Chris. Our Patient's Autologous Stem Cells Are Drugs: The FDA Moving Down a Dangerous Slippery Slope. (2 pages good review of the one to one and one to many medical risks)
<http://fapmm.net/FAPM%20Centeno%20Editorial%20on%20Public%20Health%20Impacts%20of%20FDA%20Regulating%20Practice%20of%20Medicine.pdf>
13. Koustas, William. Aug 10 2010. Regenerative Sciences Faced with FDA Injunction.Hyman, Phelps and McNamara FDA Law Blog. Very legal language
http://www.fdalawblog.net/fda_law_blog_hyman_phelps/2010/08/regenerative-sciences-faced-with-fda-injunction.html
14. Cyranoski, D. Aug 2, 2012. FDA's claim over stem cell upheld. Nature 488: 14.

May 1 no class

May 3 Social Justice, Patents, Biobanks and Public Access

HW #4 Due Controversial Quote (10%) You may choose a quote from any of the readings

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If stem cells whether adult, cord, or embryonic prove to be useful as a form of therapy, who will have access, and how will the process and research be regulated to assure both privacy and access. Reach back in our spiraling of this course, and reconsider the article by Kreiger focused on the HeLa cell line, the informed consent process, and acquisition and scale up of this particular line within the context of the future. Most of this work that we have reviewed in the course is privately funded, which of course brings us to patents. Try to connect the material here to the papers of the first third of the course, when we discussed sources of stem cells, and factors that can nudge cells into a different cell fate and the ways in which science can be equated with social progress and a competitive edge in the global marketplace.

Readings:

1. Greene, M. 2006. To restore faith and trust: Justice and biological access to cellular therapies. *The Hastings Center Report*. 36 (1): 57-63.
2. Kurtzburg J. et al. Oct 1, 2005. Untying the Gordian knot: policies, practices and ethical issues related to banking of umbilical cord blood. *The Journal of Clinical Investigation*. 115 (10): 2592-2597. Co authored by Jeremy Sugarman, this piece is a great review of the debates over public and private banking, patents on process (Pharmastem), and bills requiring public banks to expand their collections to contain more ethnically diverse samples.
3. Regenber, A. and D.JH Mathews. 2011. Promoting justice in stem cell intellectual property. *Regenerative Medicine*. 6 (6 Suppl): 79-84.
4. Garland, M. and Stull, J. Module 9: Public Health and Health Systems Reform: Access Priority Setting and Allocation of Resources. In *Ethics and Public Health. Model Curriculum*. Editors Bruce Jennings, Jeffrey Kahn, Anna Mastroianni, and Lisa Parker. 241-251.
<http://www.asph.org/document.cfm?page=782>
5. Anonymous. April 19, 2012. Justice for All. *Nature*.
<http://www.nature.com/nature/journal/v484/n7394/full/484287a.html>

Optional

1. The Royal Society of London. 2003. Keeping Science Open: The effects of intellectual property on the conduct of science. **READ only the Summary (pages 1-6 in the Adobe reader)**
<http://royalsociety.org/policy/publications/2003/keeping-science-open/>
2. Faden, R. et al. (2003). Public Stem Cell Banks: Considerations of Justice in Stem Cell Research and Therapy. *The Hastings Report*. November-December. This is an excellent short review of the issues in terms of public access.
<http://www.hopkinsmedicine.org/bioethics/research/pcepp/fadenHCR.pdf>
http://www.thehastingscenter.org/pdf/publications/public_stem_cell_banks_methods.pdf

May 8: Social Policy Making and Wrap Up

In this last class session we revisit the notion of policy making in the midst of a pluralistic society and use our infographic to map the biology, ethics, and policy of SCR to better understand our choices as individuals and as a community seeking public good.

Reading:

1. Davis, F. D. 2010. Mission possible: National bioethics commissions beyond conservative/liberal divide. *The Good Society*. 19(1): 33-40.
2. Sulmasy, D. P. March 2009. Deliberative Democracy and Stem Cell Research in New York State: The Good, the Bad, and the Ugly *Kennedy Institute of Ethics Journal* - 19(1):63-78.
3. Blackburn, E. and J. Rowley. 2004 Reason as our guide. *PLOS*. 2 (4):

May 10: Exam

HW #5: Written Evaluation Due

May 14: All Rewrites Due

TENTATIVE FIELD TRIP

Sperm to Stem Cells: Marco Seandel, NYSCF Fellow, Cornell Weill Medical College

Marco was a NYSCF fellow working in the Rafii lab. Note the timing of the article publication, the style of each article/ radio show, and the target audience. The last article is a research article, so pay attention to the abstract, the introduction, the figures and the conclusions. First try to skim and only circle words that you have across before—to help you get grounded in the paper. Pay close attention to the last sentence, Note: The LacZ fusion construct is similar to the green fluorescent protein (GFP) constructs we discussed earlier in class when we reviewed viral induced pluripotent stem cells (iPSCs), except here the Lac Z is fused to the regulatory region for GP125 (so anytime GP125 is transcribed so is the LacZ gene- which produces a protein called Beta galactisidase which make a blue color in the presence of a substrate that the cells are grown in.

Reading

1. Tanne.J. Feb 2008. From Sperm to Stem Cells. HHMI Bulletin.:9.
2. Sept 20, 2007. Stem cells derived from adult testes produce wide range of tissue types for therapeutic organ reorganization. HHMI Research News.
3. Palca, J. Scientists Find Less Controversial Stem Cell. September 20, 2007. NPR Radio.<http://www.npr.org/templates/story/story.php?storyId=14556298>.
4. Seandel, M. et al. Sept 20 2007. Generation of functional multipotent adult stem cells from GPR125+ germline progenitors. Nature. 449- 52.

Questions

1. How did the researchers trace their cells in the various experiments?
2. How do the researchers test for pluripotency?
3. How similar are the MASCs to ESCs?
4. What are the concerns in moving this research forward?