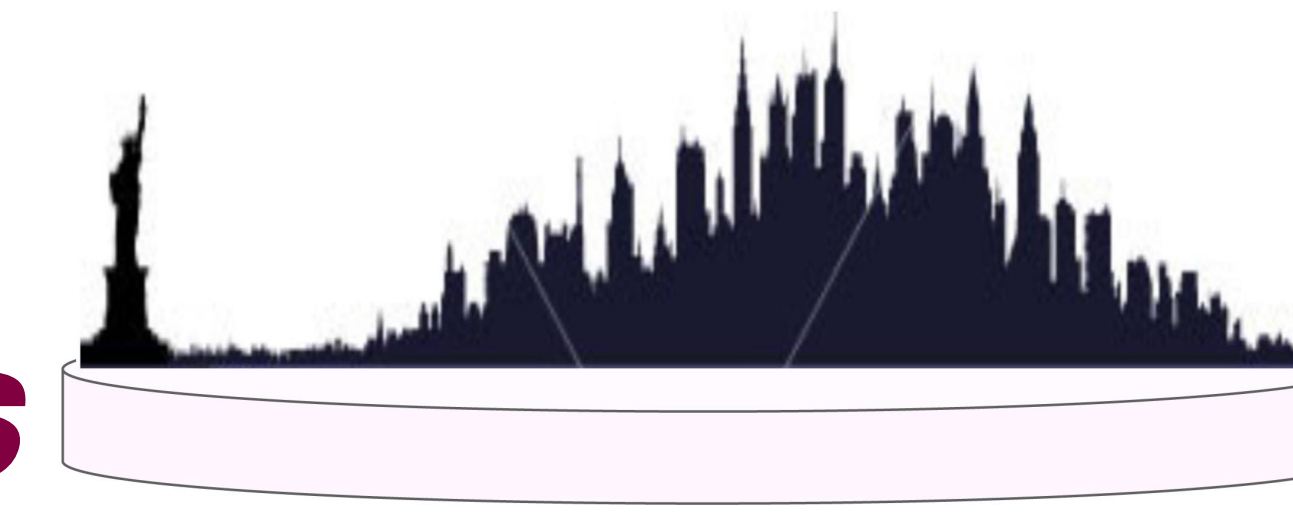


Stem Cells in the City Making Biology Relevant Through Local Community Projects



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Abstract:

The “*Science and Politics of Stem Cells*” is an interdisciplinary civic engagement course that provides a balanced view of the biological, ethical, legal, and social justice dimensions of stem cell research. Students communicate knowledge learned through authentic assessments that include student-designed projects that raise awareness and understanding of stem cell research and its implications for society.

Introduction:

Eugene Lang College is a member of Project Pericles, a not-for-profit organization that encourages and facilitates commitments by colleges to include education for social responsibility and participatory citizenship as an essential part of their educational programs in the classroom, on the campus, and in the community.

The *Science and Politics of Stem Cells* course was selected as one of two courses to receive funding through Project Pericles in 2009 to support the production of student-generated projects and learning activities that promote civic engagement.

The scientific content of this course is based loosely on a model stem cell curriculum developed by Chamany and published by GarlandScience Publishing in 2006, and updated with current primary and secondary scientific literature as well as biological animations of cell biology.

The ethical, legal, and social justice dimensions of this online curriculum were expanded in an effort to reach a wider audience and to provide a comprehensive worldview of stem cell research.

Papers and assignments that probed the religious, cultural, and philosophical dimensions of this field were intertwined with the science, demonstrating how the field of stem cell research requires an interdisciplinary approach. In addition, students attended, or watched, webcasts of the NY State Stem Cell Science (NYSTEM) Ethics Committee Meetings during 2008-2009 and participated in a Debating for Democracy Workshop hosted by Project Pericles.

Questions:

1. Does the inclusion of social justice content attract a more diverse student body?
2. After completion of this course, will freshman enroll in more interdisciplinary science courses?
3. Can *civic engagement* improve student attitudes towards science education?
4. Can students who initially express interest only in the social aspects of stem cells learn to appreciate and understand the biology of stem cells?

Civic Engagement with Community Partner (NYSCF)

Students collaborate and design education and outreach materials for local community partner, The New York Stem Cell Foundation (NYSCF) and disseminate the work of the NY State Ethics and Funding Committees for Stem Cell Research. Students propose projects based on their disciplinary expertise and interests, while NYSCF selects post-doctoral fellows whose work could be enhanced through these projects. Course projects will promote education and awareness on three levels: **undergraduates** gain first-hand knowledge of biomedical research through course content and interaction with NYSCF fellows; **NYSCF postdoctoral fellows** acquire experience communicating and teaching science to a general audience through student interactions and a public programming series; **the general public and university campus** has the opportunity to engage with researchers through the public series, online forums, and other student-generated products.

Community Outreach Through Student Projects

Public Programming: Stem Cells in the City

- April 7: Law, Ethics, and The Public Interest/ NYSTEM Ethics Committee Member Panel
April 14: Labs, Narratives, and Film/Terra Incognita Film Screening and Panel, Xiao Hu, New York Stem Cell Foundation Drunkenmiller Fellow, Albert Einstein Medical College
April 21: Sperm to Stem Cells/Marco Seandel, New York Stem Cell Foundation Druckenmiller Fellow, Memorial Sloan Kettering Cancer Center

Social Justice Conference/ Health Empowerment Session

April 18: Stem Cells and Social Justice Educational Workshop

Social Networking, Advertising, and Awareness

Flyers, logo, and information dissemination via Facebook and Blog <http://stemcellsnyc.blogspot.com>

New School Radio Show and Public Service Announcement

Interviews with NYSCF Fellows, NYSCF President Susan Solomon, and participants of the public programming events

NYSCF Virtual Lab Tour

Video and photographic stills of lab equipment with voiceover of history, purpose, and cost to operate and maintain

Stem Cells in the City Postcard

Visual architecture of stem cell research information for widespread dissemination

Book Sale and Reviews

Book sales at public programming coupled with book reviews

Newspaper Feature, Columns, and Facebook Summaries

News that covers the public programming events and integrates current politics and breakthroughs in stem cell sciences

Stem Cells and Social Justice

Race and Gender: *HeLa Cell lines*

Content: tissues culture, cell differentiation, and cancer

Ethics: political, cultural, social perspectives on language surrounding “contamination,” “promiscuous,” and “aggressive”

Resources: Landecker, H. 2007. *Culturing Life: How Cells Became Technologies*. Harvard University Press; Curtis, A. 1998. “Modern Times: The Way of the Flesh” BBC.

SES and Diversity: *Public Stem Cell Banks*

Content: sources and methods of procuring pluripotent stem cells

Ethics: diversity of cell lines, IVF cost, patents

Resources: Battey et al. 2008. “Chapter 8: Alternative Methods For Preparing Pluripotent Stem Cells. *In* Regenerative Medicine. National Institutes of Health. 1-12; Special Issue of the *Hastings Center Report*. 36(1). 2006.

SES and Gender: *Oocyte Donation/ Informed Consent*

Content: meiosis, reproduction, IVF, parthenogenesis, hormones

Ethics: payment for burden/exploitation, harm/access, regulation

Resources: *Hastings Center Reports*; *Kennedy Institute of Ethics Journal*; and *Nature*

Pilot Course Spring 2009

To test the effect of an interdisciplinary project-oriented course on student learning and attitude, pre-attitudinal surveys and mid-course assessments were administered.

Eugene Lang College Sample n= 15

- 9 Freshman (8 undeclared majors and 1 psych major)
- 2 Sophomores (economics and interdisciplinary science)
- 2 Juniors (interdisciplinary science)
- 1 Senior (African American Literature)
- 1 High school student (Institute of Urban Education Partnership)
- 5/15 Under-represented minority students
- 4/15 Male
- 11/15 Female

Reason for registering for the course

Range of interests spanning religion, reproductive/gender health, bioethics, policy, and developmental biology (how a cell knows what to do, and where and when to do it)

Pre Course Content Knowledge

9/15 could crudely define a stem cell

Mid Course Open Ended Responses:

5/15 experienced an attitude shift → will register for more science

8/15 appreciated the depth of biological content married to social aspects

8/15 stated that civic engagement component essential for learning

13/15 answered the following question providing biological details regarding nuclear reprogramming, cell differentiation, and the formation of three germ layers during gastrulation. *Provide two biological reasons for Lewis Wolpert’s famous quote: “It is not birth, marriage or death, but gastrulation that is the most important event in life.”*

Students As Change Agents:

“The project excited me because one of the feelings I get in a seminar discussion in a liberal school is that we never do anything about the things over which we are upset. This is a forum to apply the discussion to the real world. I hope this can be a template for me in future discussions like this”-- LSO

“The most frustrating part ... is that I wish we could reach more people at once.”-- CC
“As youth we are the future donors and voters.”-- FG

“I am most excited about being able to see a real working lab facility and meeting people who actually are involved in scientific research...I have never really been interested in policy making or politics really at all and this course absolutely showed me how important it is to be aware and connected with what is going on...you can’t assume anyone knows what you know or thinks the same as you, I find it interesting to be exposed to so many different kinds of thinking, even just in our class.” --EF

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For More Information:

The *Cell Biology for Life* stem cell curriculum can be accessed here <http://www.garlandscience.com/textbooks/cbl>. Potential collaborators can sign the sheet below and more information about collaboration can be obtained by emailing chamanyk@newschool.edu or visiting the Lang College Interdisciplinary Science website http://www.newschool.edu/lang/faculty_dev.aspx?id=1716&sc=LSTS

Course Flow

