

History of Science 237 Postgenomics

Prof. Sarah S. Richardson

srichard@fas.harvard.edu

Boylston Hall, G26

Office Hours: Wednesdays, 10 am – 12 noon, by online sign-up

Class meeting time: Tuesdays, 2-4 pm, Science Center 469

Course website: <http://isites.harvard.edu/icb/icb.do?keyword=k96173>

Course Overview

How have the life sciences been transformed by the completion of the human genome projects and the arrival of whole-genome technologies? Joining "postgenomic" assessments of the genome projects, this seminar examines the history and contemporary practice of genomics from a multidisciplinary perspective. Topics include the role of technology, government funding, private industry, and race, gender, and nationality in the historical development of genomics, the ways in which genomic research challenges traditional conceptions of biology and science, and the implications of emerging trends such as direct-to-consumer genomics and whole-genome sequencing.

This course is intended primarily for graduate students. Space allowing, advanced undergraduates may be admitted with the permission of the instructor. Each week we will read an important and challenging book-length text on the genome sciences. The expectation is that students will arrive highly prepared and will engage in vigorous class discussion. Working with the professor, students will produce a substantive seminar research paper that may form the basis for future publishable work.

Class Schedule

Date	Required Readings
Sept. 3	Opening discussion Sept. 6, 12 noon: class presentation sign-up (iSite)
Sept. 10	Kay, Lily E. <i>Who wrote the book of life?: a history of the genetic code.</i> (2000)
Sept. 17	Cook-Deegan, Robert M. <i>The gene wars: science, politics, and the human genome.</i> (1994)

Sept. 24	Keller, Evelyn Fox. <i>The Century of the gene</i> . (2000)
Oct. 1	Barnes, Barry, and Dupré, John. <i>Genomes and what to make of them</i> . (2008)
Oct. 8	Fortun, Michael. <i>Promising genomics: Iceland and deCODE Genetics in a world of speculation</i> . (2008)
Oct. 15	Thacker, Eugene. <i>The global genome: biotechnology, politics, and culture</i> . (2005) Date/time TBA: Tour of Broad Institute genome sequencing facility
Oct. 22	Atwood, Margaret. <i>Oryx and Crake</i> . (2003) View one film: <i>Jurassic Park</i> (1993), <i>Gattaca</i> (1997), <i>Splice</i> (2009) (on reserve at Lamont)
Oct. 29	Bliss, Catherine. <i>Race decoded: the genomic fight for social justice</i> . (2012)
Nov. 5	Abu El-Haj, Nadia. <i>The genealogical science: the search for Jewish origins and the politics of epistemology</i> . (2012) View one film: <i>Motherland: A Genetic Journey</i> (BBC, 2003), <i>African American Lives</i> (PBS, 2006-) (two episodes of your choice), or <i>Journey of Man: A Genetic Odyssey</i> (PBS, 2003-) (two episodes of your choice) (available online, see web links on course website) Nov. 10: Paper proposal due
Nov. 12	Shostak, Sara. <i>Exposed science: genes, the environment, and the politics of population health</i> . (2013)
Nov. 19	Stevens, Hallam. <i>Life out of sequence: a data-driven history of bioinformatics</i> . (2013)
Nov. 26	<i>Theorizing Postgenomics: Recent Literature (see course website for assigned articles)</i>
Dec. 3	Student Presentations of Research Papers <i>Post-Postgenomics: drinks & apps at Cambridge Common, 1667 Mass Ave, 4-5:30 pm, Dec. 3</i> Dec. 10: Final paper due

Required Books

All books are available for purchase at the Harvard COOP and have been placed on reserve at Lamont Library. Starred books are available in e-book format through HOLLIS. Additional required and recommended texts will be available on the course website.

1. Kay, Lily E. Who wrote the book of life?: a history of the genetic code. (2000)
2. Cook-Deegan, Robert M. The gene wars: science, politics, and the human genome. (1994)
3. Atwood, Margaret. Oryx and Crake. (2003)
4. Fortun, Michael. Promising genomics: Iceland and deCODE Genetics in a world of speculation. (2008)
5. Keller, Evelyn Fox. The Century of the gene. (2000)
6. *Thacker, Eugene. The global genome: biotechnology, politics, and culture. (2005)
7. *Barnes, Barry, and Dupré, John. Genomes and what to make of them. (2008)
8. Bliss, Catherine. Race decoded: the genomic fight for social justice. (2012)
9. Abu El-Haj, Nadia.. The genealogical science: the search for Jewish origins and the politics of epistemology. (2012)
10. *Shostak, Sara. Exposed science: genes, the environment, and the politics of population health. (2013)
11. Stevens, Hallam. Life out of sequence: a data-driven history of bioinformatics. (2013) (*Note: This book will be released on Oct. 12.*)

Course requirements

20%	Attendance and participation: Vigorous, attentive, and constructive participation in class discussion and respectful listening; demonstration of deep reading and thoughtful, engaged approach to course readings and concepts; 100% attendance expected except for illness; more than 2 absences for any reason, including illness, may result in being dropped from the class.
20%	In-class presentation: 15-minute PowerPoint presentation outlining key concepts from the day's reading, framing discussion questions, and effectively using images, multimedia, and textual analysis. See guidelines. Advance consultation with the professor is required.
20%	Discussion board postings: Weekly 1-page reading response posting on the course discussion board by 12 noon before each class: must meet guidelines provided in handout for length and content. You may skip 1 posting.
40%	Research paper of 20-25 pages: 4-page paper proposal and 1-page bibliography due November 10; Final due December 10; requires a meeting with the professor. See guidelines.

Guidelines for Course Requirements

1. Participation (20%)

This is a student-centered seminar in which participation and intensive discussion is essential. Your participation is a central element of this course and will frame my evaluation of your academic performance.

Requirements:

- Consistent on-time attendance
- Completion of assignments by due date
- Bring course readings and notes to class and show evidence of deep reading, preparation, and critical thinking
- Participate vigorously, constructively, and attentively in class discussion
- Generous and invested contributions to course discussion board
- Meet with professor in office hours

2. Class Presentation (20%)

Each meeting will begin with a student presentation. The goal of these presentations is to enrich the class discussion with your perspectives and expertise, provide an opportunity to learn effective use of PowerPoint technology, sharpen your oral presentation skills, and improve your comprehension of the material by teaching it to others.

Sign-ups will open on Sept. 6 at noon, via the course iSite. In consultation with the professor, you will design a 15-minute PowerPoint presentation outlining key concepts for the day's topic and framing discussion questions. Your presentation should use images, multimedia, and textual analysis effectively. *Requires advance meeting with professor.*

Requirements:

- Discuss with the professor at least 1 week in advance
- Careful reading of the materials
- Email your PowerPoint file to the professor by 12 pm the day of your presentation

Presentation elements:

- Interest the audience in the topic and share what you found interesting, surprising, new, or provocative
- Briefly outline the key concepts from the day's readings
- Define any key terms
- Briefly outline controversies and debates
- Relate to themes and concepts from the course as a whole

- **IMPORTANT:** Use images, multimedia, and textual analysis of quotations from the reading to facilitate understanding (make sure to include citations)
- Close with at least one important question that you hope the class will engage
- Maximum of 15 minutes (~10 slides)

Evaluation of your presentation will be based on the following elements:

- *Preparation:* Were you prepared? Is it obvious that you read closely and tried to get help if you needed it?
- *Clarity:* Was your presentation clear? Did you attempt to simplify complex concepts? Was your presentation organized and well thought-out?
- *Content:* Did you address all of the items above? You don't necessarily have to include all of them, but you should try to follow the basic outline.
- *Discussion:* Did your presentation facilitate the discussion? How did you answer questions from the professor and the class?
- *Oral communication and presentation style:* Did you speak loud enough? Slow enough? Clear enough? Did you have good eye contact with your audience? Were you responsive to the audience? Was your presentation engaging and interesting?
- *Effective use of PowerPoint technology (IMPORTANT):* Did the visual presentation enhance and enliven your talk? Did you find novel and relevant images and multimedia?

3. Discussion board postings (20%)

Due: 12 noon each Tuesday

Our class discussion board will permit the continuation of discussion outside of class and provide an opportunity for you to formulate questions and responses to the readings prior to class. These brief, *informal*, exploratory written reading responses will also help you identify topics, themes, questions, and material for your final project.

Requirements:

- Post *at least* one item by 12 noon before each class
- Minimum of one type-written page or 500 words (or two 250-word posts)
- Posting must evidence critical, original engagement with the texts
- You may skip 1 post with no consequences for your grade
- On the day of your presentation, posting your presentation to the discussion forum constitutes your contribution for the week
- You are encouraged to be active in the discussion forum. Although not required, this will reflect positively on your class participation evaluation. For example, you might post additional articles, upcoming events, and news items relevant to the discussion. You might also respond to others' posts. These additional postings need not conform to length/content requirements of the required posts.

4. Final paper (40%)

20-25 page research paper. Requires 4 page proposal with bibliography and advance meeting with professor.

The objective of the final paper is to develop a *first draft* of a potentially publishable research paper or dissertation chapter examining the historical, social, or cultural dimensions of the postgenomic life sciences. The paper must go beyond literature review to advance an original argument using primary source materials. As this is an interdisciplinary seminar, it is up to the student, in consultation with the professor, to define the disciplinary and methodological focus of the paper.

Proposal: Write a 4-page (double spaced) proposal laying out your research question, the motivation for your question, the sources and methods you will use, the feasibility of the project in the time allotted, and a brief outline. Provide a separate annotated bibliography, properly formatted, with at least 8 valid academic sources (note: these may be from our course materials). Under each citation, write a 1-2 sentence summary of the thesis of the source and its relevance to your project.

The professor will respond to your paper or project proposal. You may be asked to revise certain aspects of your plan based on this feedback. Your final project should be a polished realization of your proposal. You may use text from the proposal, your discussion board postings, and your class presentation in your final paper. The final version is due to the professor on December 10.

Writing guidelines:

- Clear statement of thesis and research question
- Appropriate situation of research question in the relevant extant literature
- Advances an original argument using primary source materials
- Uses specific examples, quotations, and details to support the argument
- The paper has a clear structure and the argument flows logically
- Clean grammar and spelling

Formatting guidelines:

- 20-25 pages of main text
- MS Word .doc format
- References and footnotes are not included in the page count and should be appended after the main text
- Wherever possible, include images and figures if they are referenced in the text (does not count towards required length)
- Provide complete citations in a consistent, recognized academic citation style of your choice
- Double-spaced, 12 pt Times New Roman font
- 1 inch margins
- Name and page number on the upper right header of each page

Course policies

Course website:

iSites is a primary tool for this course and will contain the discussion forum and many required and recommended readings. Please check the site frequently. Up-to-date syllabus, readings, assignments, handouts, web links, and course announcements will be posted on the course website.

Class announcements:

Details about assignments, schedule changes, and other announcements will be posted on the course website. Special announcements will be sent to your Harvard email account. You are responsible for checking the course website and your Harvard email regularly.

Class attendance:

This is a small discussion-based course that requires your on-time attendance and full participation. We will begin at 7 minutes past the hour and conclude at the end of the hour. More than two absences or late arrivals *for any reason* may lead to dismissal from the course.

Assignments and feedback:

Student work should be submitted in Word format in the Dropbox on the course iSite. The professor will provide feedback using digital mark-up.

Late policy:

Late assignments will incur a 10% penalty per day. If an assignment is due at 5 pm, and you turn it in at 5:30 pm, the highest grade that you can receive is a 90. The professor reserves the right not to provide written feedback on late work. Extensions are granted only with advance notice and usually only in cases of illness.

Office hours:

I invite you to visit me regularly in office hours during the semester. Sign-up is online at <http://wgs.fas.harvard.edu/icb/icb.do?keyword=k53419&pageid=icb.page377570>. If you are unable to attend the scheduled office hours, email me to set up a time to meet.

Email:

Keep emails brief and professional. Visit me in office hours if you have detailed questions about the assignments or readings. Emails will be answered within 24 hours on weekdays and non-holidays. Do not rely on email for last minute questions.

Technology policy:

No phones at the seminar table – please silence them and keep them stored away. Hand written notes are best for learning retention and are least disruptive to

discussion. If a laptop or similar technology will benefit you in the classroom and you can use it without being disruptive, you are welcome to use it. Please use your judgment. Consider the positives and negatives for you and your learning style and the effect on others in the room. Attend carefully to your participation in the class discussion. Close web browsers, email, and instant messaging programs. I recommend disconnecting your wifi. Please disable any sounds. The class expects the professor to step in if technology use becomes disruptive. Disrespectful use of technology will impact your class participation evaluation.

Statement on disabilities:

If you have a documented physical, psychological, or learning disability, please notify me within the first two weeks of the semester regarding reasonable and appropriate academic accommodations to help you succeed in this course.

Statement on academic honesty:

Academic dishonesty (including cheating, fabrication, plagiarism, facilitating dishonesty, submitting the same work for multiple classes) is prohibited and will lead to dismissal from the course and referral to Harvard disciplinary procedures. See: http://webdocs.registrar.fas.harvard.edu/ugrad_handbook/current/chapter2/academic_dishonesty.htm

Statement on collaboration:

Discussion and the exchange of ideas are essential to academic work. For assignments in this course, you are encouraged to consult with your classmates on the choice of paper topics and to share sources. You may find it useful to discuss your chosen topic with your peers, particularly if you are working on the same topic as a classmate. However, you should ensure that any written work you submit for evaluation is the result of your own research and writing and that it reflects your own approach to the topic. You must also adhere to standard citation practices in this discipline and properly cite any books, articles, websites, lectures, etc. that have helped you with your work. If you received any help with your writing (feedback on drafts, etc), you must also acknowledge this assistance.