

History of Science 180: *The 20th Century Gene: From Eugenics to Epigenetics*

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Office hours: by appointment

Fall 2016
202 Bradley Memorial Building
MW 2:30–3:45 p. m.

The DNA double helix structure is perhaps the most well known discovery of twentieth century biological research. How did genetics come to occupy such a prominent place in both scientific and popular thinking? What are the consequences of the attention scientists, policy makers, and ordinary people devote to genes? This course will address these questions by tracing out the historical arc of genetic research over the course of the twentieth century, from the eugenics movement at its beginning to the global initiative to sequence the human genome at its close. We will examine the intertwined histories of biometrics, classical genetics, medical genetics, and eugenics; focusing in particular on eugenics in the United States and Wisconsin. We will see how genetics seems to move away from medicine at mid century with the rise of molecular biology, only to reenter mainstream medicine at the century's conclusion. The final section of the course focuses on the social and ethical implications of contemporary genetics, such as research on epigenetic inheritance. The course is discussion based, with occasional in-class lectures that provide additional background on topics not covered by the course readings. Assignments for this course include oral presentations and essays, with a focus on developing revision skills.

Course Objectives

By the end of the course, you will be able to:

- identify key people, events, technologies, and institutions in the history of genetics;
- describe how genetic research has changed over the course of the twentieth century;

- articulate the connections between scientific research on genetics and other domains such as medicine, public policy, and popular culture;
- reflect on the insights that controversial moments in the history of genetics (such as the eugenics movement) hold for contemporary society;
- accurately summarize the key points in individual articles, synthesize themes across bodies of academic scholarship, and present these findings orally;
- develop and defend your own academic arguments in writing; and
- use revision techniques to evaluate and improve the quality of your oral and written assignments.

Course materials

There are no required texts for the course. Readings marked with a * in the syllabus are available for download through UW–Madison’s electronic library collections. Scanned copies of the remaining readings will be available on the Canvas site for the course. Please bring either a digital or a paper copy of the assigned readings with you to class, so that you can refer to them during discussion.

Assignments and grading

<i>Assignment</i>	<i>% of final grade</i>	<i>Due date</i>
Class participation	10%	formative assessment at mid semester
Reading responses	10%	as assigned throughout semester
Oral presentation	15%	as assigned throughout semester
Archives assignment	10%	October 3
Research paper	15%	October 31
Revised research paper	20%	November 23
Genetics curriculum	20%	December 14

Detailed descriptions and a rubric for all assignments are available for download on the Canvas site.

Course policies

Absences: You are allowed one “freebie” absence during the semester, which you can take for any reason and at any time. For additional absences due to illness, family emergencies, scheduled conflicts, or other legitimate reasons, you can make up the missed participation grades by handing in a 250 word informal reading response instead of attending class. You must contact me in advance of the missed class (except in exceptional circumstances) to clear your absence with me and agree on a due date for your reading response.

Grading and late assignments: All assignments will receive a numeric score (e.g. 29/30), which will also be displayed as a percentage score on the Canvas website. Your final percentage grade will be converted into a final letter grade using the conversion table below. Late assignments will be penalized by 3% of the total assignment points per day, unless you have made prior arrangements with me.

A	AB	B	BC	C	D	F
93.0–100%	88.0–92.9%	83.0–87.9%	78.0–82.9%	70.0–77.9%	60.0–69.9%	0–59.9%

Students with disabilities I am available to discuss academic accommodations for students with disabilities. Please present your McBurney visa to me within the first three weeks of the semester (except in unusual circumstances) so that there is enough time for appropriate arrangements to be made.

Academic integrity All students are expected to adhere to the University of Wisconsin—Madison’s core values regarding academic integrity. Plagiarism or other academic misconduct may result in a zero on the assignment or exam, a lower grade in the course, or failure in the course. See the Dean of Students Office website for more information about the academic misconduct process (<http://https://www.students.wisc.edu/doso/academic-integrity/>).

Course schedule

Week 1: Introduction

Sept 7

- No readings

Week 2: Telling the History of Genetics

Sept 12

- Matt Ridley. 1999. *Genome: The Autobiography of a Species in 23 Chapters*. Harper Collins, 38–53
- Robert C. Olby. 2000. “Horticulture: The Font for the Baptism of Genetics.” *Nature Reviews Genetics* 1 (1): 65–70. doi:10.1038/35049583*

Sept 14

- Robert E. Kohler. 1994. *Lords of the Fly: Drosophila Genetics and the Experimental Life*. Chicago: University of Chicago Press, 19–52

Week 3: Genetics and Eugenics

Sept 19

- Barbara A. Kimmelman. 1983. "The American Breeders' Association: Genetics and Eugenics in an Agricultural Context, 1903-13." *Social Studies of Science* 13 (2): 163–204. doi:10.2307/284589. JSTOR: 284589*

Sept 21

- Daniel Kevles. 1985. *In the Name of Eugenics : Genetics and the Uses of Human Heredity*. New York: Knopf, 3–19
- W. Bateson. 1906. "An Address on Mendelian Heredity and Its Application to Man." *British Medical Journal* 2 (2376): 61–67*

Week 4: Eugenics in Wisconsin

Both classes this week will be held at the Wisconsin Historical Society (816 State St). Please meet in the lobby of the building five minutes before class time.

Sept 26

- Bennett O. Odegard and George M. Keith. 1939. *A History of the State Board of Control of Wisconsin and the State Institutions, 1849-1939*. Madison, WI: State Board of Control, 73–75

Sept 28

- No readings

Week 5: Class, Gender, and Eugenics

Oct 3

- No readings
- Film: A Bill of Divorcement
- *Archives assignment due*

Oct 5

- Robert Proctor. 1988. *Racial Hygiene: Medicine under the Nazis*. Cambridge, Mass.: Harvard University Press, 118–30

Week 6: Eugenics after World War II

Oct 10

- Diane B. Paul. 1998. *The Politics of Heredity : Essays on Eugenics, Biomedicine, and the Nature-Nurture Debate*. SUNY Series, Philosophy and Biology. Albany: State University of New York Press, 53–80*

Oct 12

- Jennifer Robertson. 2010. “Eugenics in Japan: Sanguinous Repair.” In *The Oxford Handbook of the History of Eugenics*, edited by Alison Bashford and Philippa Levine, 430–448. Oxford: Oxford University Press
- Carolyn Strange and Jennifer A. Stephen. 2010. “Eugenics in Canada: A Checkered History, 1850s-1990s.” In *The Oxford Handbook of the History of Eugenics*, edited by Alison Bashford and Philippa Levine, 523–538. Oxford University Press

Week 7: Molecular Biology

Oct 17

- *No class meeting*

Oct 19

- Soraya de Chadarevian. 2002. *Designs for Life: Molecular Biology after World War II*. Cambridge: Cambridge University Press, 50–97
- Robert M. Cook-Deegan. 1994. *The Gene Wars: Science, Politics, and the Human Genome*. W. W. Norton & Company, 92–106

Week 8: The Return of Eugenics?

Oct 24

- M. Susan Lindee. 2000. “Genetic Disease since 1945.” *Nature Reviews Genetics* 1 (3): 236–241. doi:10.1038/35042097*
- Troy Duster. 2003. *Backdoor to Eugenics*. 2nd ed. New York: Routledge, 111–28

Oct 26

- Richard J. Herrnstein and Charles Murray. 1994. *The Bell Curve: Intelligence and Class Structure in American Life*. New York: Free Press, 317–40

Week 9: The Flexible Gene

Oct 31

- John Cloud. 2010. "Why Genes Aren't Destiny." *Time* (January 18): 48–53.
- H. S. Jennings. 1924. "Heredity and Environment." *The Scientific Monthly* 19 (3): 225–238*
- *Essay due*

Nov 2

- No readings
- *Peer review workshop*

Week 10: Epigenetic Destinies

Nov 7

- Sarah Richardson. 2015. "Maternal Bodies in the Postgenomic Order." In *Postgenomics: Perspectives on Biology After the Genome*, edited by Sarah Richardson and Hallam Stevens, 210–231. Durham, NC: Duke University Press

Nov 9

- No readings
- *Major revisions workshop*

Week 11: The Gene in Everyday Life

Nov 14

- Barbara Duden. 2009. "What Genes Say." In *Ideas on the Nature of Science*, edited by David Cayley, 257–265. Fredericton, N.B.: Goose Lane Editions
- Margaret Lock et al. 2006. "When It Runs in the Family: Putting Susceptibility Genes in Perspective." *Public Understanding of Science* 15 (3): 277–300. doi:10.1177/0963662506059259*

Nov 16

- Rayna Rapp. 2000. *Testing Women, Testing the Fetus: The Social Impact of Amniocentesis in America*. New York: Routledge, 165–92

Week 12: Teaching Genetics

Nov 21

- Gregory Radick. 2016. "Teach Students the Biology of their Time." *Nature* 533 (7603): 293. doi:10.1038/533293a*
- *Minor revisions workshop*

Nov 23

- No readings
- Film: GATTACA
- *Essay due*

Week 13: Genetics, Culture, and Identity

Nov 28

- Lennard J. Davis. 2006. "Constructing Normalcy." In *The Disability Studies Reader*, edited by Lennard J. Davis, 3–16. New York: Routledge
- Video: The End

Nov 30

- Kim TallBear. 2013. *Native American DNA: Tribal Belonging and the False Promise of Genetic Science*. Minneapolis: University of Minnesota Press, 143–76

Week 14: Contemporary Cases

Dec 5

- Daniel Navon. 2011. "Genomic Designation: How Genetics Can Delineate New, Phenotypically Diffuse Medical Categories." *Social Studies of Science* 41 (2): 203–226. doi:10.1177/0306312710391923*
- Gina Kolata. 2012. "Study Divides Breast Cancer Into Four Distinct Types." *The New York Times* (September 23): A1*

Dec 7

- Student choice: Readings TBA

Week 15: Scientific Responsibility

Dec 12

- Jon Beckwith and Franklin Huang. 2005. "Should We Make a Fuss? A Case for Social Responsibility in Science." *Nature Biotechnology* 23 (12): 1479–1480. doi:10.1038/nbt1205-1479*
- Richard Lewontin, Steven Rose, and Leon Kamin. 1984. *Not in Our Genes : Biology, Ideology, and Human Nature*. New York: Pantheon Books, 17–36

Dec 14

- No readings
- Curriculum assignment due