

140.143 Genetics in Medicine and Society

Spring 2007

Lectures MT 9-10, MD 109

Section W 9-10, MD 104 or MD 217

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Miscellaneous rules and guidelines

- Please turn off cell phones before entering class.
- Feel free to bring water, coffee, or a soft drink, but please do not eat in class.
- If you arrive late or must leave early, please do so quietly and undistruptively. Frequent tardiness or absence will affect your grade.
- Please address each other, your TAs, and your professor respectfully.
- Students are expected to conduct themselves in an honest and ethical manner, as stipulated by common sense and JHU policy (<http://catalog.epp.jhu.edu/content.php?navoid=64>).

Assignments and Grading

- Book reviews (2x15% of final grade)

You will write two book reviews, selecting the books from the five we will read this term (note: not the articles). The reviews should be 1,000–1,500 words in length and should be in the style of the reviews in the journals *Science* or *Nature*. Please read a number of these before beginning your own, looking especially for books relating to the history of genetics. A good review gives an accurate synopsis of the book *and* evaluates it in terms of argument, evidence, audience, interest and significance, and style. A superb review also adds a novel idea or interpretation of the reviewer's own—the review is worth reading for its own sake, not just as a guide to the book.

Reviews may be handed in up to one week after we finish the book, or any time before. Feel free to consult with your TA or with me as you think about and write these.

As a matter of integrity, reviewers never read other reviews of the book before they write their own. As a matter of research ethics, your instructors have read most of the published reviews of these books and will recognize others' ideas if we read them in your reviews.

- Research proposal (30% of final grade)

Your final assignment will be a 10 p. research proposal for a topic on the history of genetics. Write the proposal as if you are applying for a grant from the National Science Foundation or National Institutes of Health. I will supply details later, but your proposal will be graded on intrinsic interest, originality, thoroughness, doability, writing style, and bibliography.

- Discussion Section (40% of final grade)

Required Books (available at the campus bookstore)

Kevles, Daniel J. *In the Name of Eugenics: Genetics and the Uses of Human Heredity*. Second ed. Harvard University Press, 1995.

Kohler, Robert. *Lords of the Fly: Drosophila Genetics and the Experimental Life*. University of Chicago Press, 1994.

Morange, Michel. *A History of Molecular Biology*. Cambridge, Harvard University Press, 1998.

Nelkin, Dorothy, and Susan Lindee. *The DNA Mystique: The Gene as a Cultural Icon*. W.H. Freeman & Co., 1995.

Watson, James D. *The Double Helix*. Norton Critical Edition ed. WW Norton, 1981.

Lectures and reading schedule

Important: Read these assignments carefully. Many assignments carry instructions reducing the number of pages to read, or advising you to skim parts or the whole. Also, in several instances I have made readings "supplemental." Read these if you are interested, but know that the essential points will be made in class.

I expect about 3–4 hours of reading per week. Gauge your efforts accordingly and learn to "gut" longer readings rather than reading word by word.

Articles are available at reserves.library.jhu.edu.

Lec#	Date	Lecture	Reading
	Week 1:		
1	Mon., 1/22	Introduction	
2	Tue., 1/23	What did Gregor Mendel think he discovered?	<i>Required:</i> Mendel, Gregor. "Versuche Über Pflanzen-Hybriden ('Experiments in Plant Hybridization')." <i>Verhandlungen des naturforschenden Vereines in Brünn</i> 4 (1866): 3–47.
			<i>Supplemental:</i> Olby, Robert. "Mendel No Mendelian?" <i>History of Science</i> 17 (1979): 53–72. Hartl, Daniel, and Vitezslav Orel. "What Did Gregor Mendel Think He Discovered?" <i>Genetics</i> 131 (1992): 245–253.
	Wed., 1/24		Discussion
	Week 2:		
3	Mon., 1/29	19 th century theories of heredity	Darwin, Charles. "Provisional Hypothesis of Pangenesis." In <i>The Variation of Animals and Plants under Domestication</i> , 349–99. London: John Murray, 1868, pp. 349–351; 369–378; 396–399. Galton, Francis. "A Theory of Heredity." <i>Journal of the Anthropological Institute</i> 5 (1876): 329–48. Weissmann, August. "Summary and Conclusion." In <i>The Germ-Plasm: A Theory of Heredity</i> . Charles Scribner's Sons, 1893. Various. "Discussion of the Advisability of the Registration of Tuberculosis." <i>Transactions and Studies of the College of Physicians of Philadelphia</i> 16 (1894): 1–27 (skim).
4	Tue., 1/30	Inventing Mendelism	Vries, Hugo de. "Das Spaltungsgesetz Der Bastarde ('the Law of Segregation of Hybrids')." <i>Berichte der deutschen botanischen Gesellschaft</i> 18 (1900): 83–90. Correns, Carl. "G. Mendel's Regel Über Das Verhalten Der Nachkommen-schaft Der Rassenbastarde ('G. Mendel's Law Concerning the Behavior of Progeny of Varietal Hybrids')." <i>Berichte der deutschen botanischen Gesellschaft</i> 18 (1900): 158–68.
	Wed., 1/31		Discussion
	Week 3:		
5	Mon., 2/5	Mendelians vs. biometricians	Froggatt, P., and N. C. Nevin. "The 'Law of Ancestral Heredity' and the Mendelian-Ancestrian Controversy in England, 1889–1906." <i>Journal of Medical Genetics</i> 8, no. 1 (1971): 1–36. Kevles, <i>In the Name of Eugenics</i> , chaps. 1–2.
6	Tue., 2/6	Origins of human genetics: Garrod and Bateson	Bateson, William. "An Address on Mendelian Heredity and Its Application to Man." <i>British Medical Journal</i> (1906): 61–67. Garrod, Archibald Edward. "The Incidence of Alkaptonuria: A Study in Chemical Individuality." <i>The Lancet</i> 2, no. 4137 (1902): 1616–20. Bearn, A. G., and E. D. Miller. "Archibald Garrod and the Development of the Concept of Inborn Errors of Metabolism." <i>Bull Hist Med</i> 53, no. 3 (1979): 315–328.

	Wed., 2/7		Discussion
	Week 4:		
7	Mon., 2/12	The white-eyed fly	Morgan, Thomas Hunt. "Sex-Limited Inheritance in Drosophila." <i>Science</i> 32 (1910): 120-22. Kohler, <i>Lords of the Fly</i> , chaps. 2-3.
8	Tue., 2/13	Fly culture	Kohler, <i>Lords of the Fly</i> , chaps. 4-5.
	Wed., 2/14		Discussion
	Week 5:		
9	Mon., 2/19	Eugenics and medicine	Kevles, <i>In the Name of Eugenics</i> , chaps. 3-5. Davenport, Charles. "Eugenics and the Physician." <i>New York Medical Journal</i> June 8 (1912): 1195-1199. Jordan, H. E. "The Place of Eugenics in the Medical Curriculum." In <i>Problems in Eugenics: Papers Communicated to the First International Eugenics Congress</i> , 396-399. Adelphi, W. C.: Eugenics Education Society, 1912.
10	Tue., 2/20	Eugenic sterilization in the US and Germany	Kevles, <i>In the Name of Eugenics</i> , chaps. 6-7. Proctor, Robert. "The Sterilization Law (Chap. 4)." In <i>Racial Hygiene: Medicine under the Nazis</i> , 95-117. Cambridge: Harvard Univ. Press, 1988.
	Wed., 2/21		Discussion
	Week 6:		
11	Mon., 2/26	Genetics between the wars	Comfort, Nathaniel. "'Polyhybrid Heterogeneous Bastards': Promoting Medical Genetics in America in the 1930s and 1940s." <i>J. Hist. Med. All. Sci.</i> 61, no. 4 (2006): 415-455. Kevles, chaps. 8-11
12	Tue., 2/27	Genetics and the bomb	Glass, Bentley (with other members of the Advisory Committee on Biology and Medicine of the Atomic Energy Commission). "Statement on Radioactive Fallout." <i>Amer. Sci.</i> 46 (1958): 138-150. Beatty, John. "Genetics in the Atomic Age: The Atomic Bomb Casualty Commission, 1947-1956." In <i>Expansion of American Biology</i> , 284-324: New Brunswick, Rutgers Univ. Press, 1991.
	Wed., 2/28		Discussion
	Week 7:		
13	Mon., 3/5	Phage and bacterial genetics	Morange, chaps. 1, 4, 5, 7-9
14	Tue., 3/6	The double helix	Watson, <i>The Double Helix</i>
	Wed., 3/7		Discussion
	Week 8:		
	NO CLASSES – SPRING BREAK		
	Week 9:		
15	Mon., 3/19	Molecular biology and the information metaphor	Morange, chaps. 11-14. Crick, Francis H. C., J. S. Griffith, and Leslie W. Orgel. "Codes without Commas." <i>Proc Natl Acad Sci U S A</i> 43, no. 5 (1957): 416-421. Gamow, George. "Possible Relation between Deoxyribonucleic Acid and Protein Structures." <i>Nature</i> 173 (1954): 318.
16	Tue., 3/20	The revolution in	Kevles, chaps. 13, 15, 16.

		human genetics	Lindee, M. S. "Genetic Disease in the 1960s: A Structural Revolution." <i>American Journal of Medical Genetics</i> 115, no. 2 (2002): 75-82.
	Wed., 3/21		Discussion
	Week 10:		
17	Mon., 3/26	The great IQ debate	Jensen, Arthur. "How Much Can We Boost Scholastic Achievement?" <i>Harvard Educational Review</i> 39 (1969): 1-123 (skim for the major argument & lines of evidence). Bodmer, W. F., and L. L. Cavalli-Sforza. "Intelligence and Race." <i>Sci Am</i> 223, no. 4 (1970): 19-29. Lewontin, Richard. "Race and Intelligence." <i>Bulletin of the Atomic Scientists</i> 26, no. 3 (1970): 2-8. Herrnstein, Richard. "I.Q." <i>The Atlantic</i> 228, no. 3 (1971): 43-64.
18	Tue., 3/27	The XYY controversy	Sandberg, A. A., G. F. Koepf, T. Ishihara, and T. S. Hauschka. "An XYY Human Male." <i>Lancet</i> 2 (1961): 488-489. Jacobs, Patricia A., et al. "Aggressive Behavior, Mental Subnormality and the XYY Male." <i>Nature</i> 208 (1965): 1351-52. Walzer, S., and P. S. Gerald. "Social Class and Frequency of XYY and XXY." <i>Science</i> 190, no. 4220 (1975): 1228-9. Beckwith, J., and et al. "Harvard XYY Study." <i>Science</i> 187, no. 4174 (1975): 298-9. Culliton, B. J. "XYY: Harvard Researcher under Fire Stops Newborn Screening." <i>Science</i> 188, no. 4195 (1975): 1284-5.
	Wed., 3/28		Discussion
	Week 11:		
19	Mon., 4/2	Recombinant DNA	<i>Required:</i> Morange, chaps. 16-18. Berg, P., D. Baltimore, S. Brenner, R. O. Roblin, 3rd, and M. F. Singer. "Asilomar Conference on Recombinant DNA Molecules." <i>Science</i> 188, no. 4192 (1975): 991-994. <i>Supplemental:</i> Wright, Susan. "Recombinant DNA Technology and Its Social Transformation, 1972-1982." <i>Osiris</i> Second Series, Vol. 2 (1986): 303-360.
20	Tue., 4/3	The clone rush	Drumm, M. L., C. L. Smith, M. Dean, J. L. Cole, M. C. Iannuzzi, and F. S. Collins. "Physical Mapping of the Cystic Fibrosis Region by Pulsed-Field Gel Electrophoresis." <i>Genomics</i> 2, no. 4 (1988): 346-354. Miki, Yoshio, et al. "A Strong Candidate for the Breast and Ovarian Cancer Susceptibility Gene BRCA1." <i>Science</i> 266, no. 5182 (1994): 66-71. Wexler, N. S. "The Tiresias Complex: Huntington's Disease as a Paradigm of Testing for Late-Onset Disorders." <i>FASEB J</i> 6, no. 10 (1992): 2820-2825. Press, N. A., Y. Yasui, S. Reynolds, S. J. Durfy, and W. Burke. "Women's Interest in Genetic Testing for Breast Cancer Susceptibility May Be Based on Unrealistic Expectations." <i>Am J Med Genet</i> 99, no. 2 (2001): 99-110.
	Wed., 4/4		Discussion
	Week 12:		
21	Mon., 4/9	Gene therapy	Friedmann, T. "Progress toward Human Gene Therapy." <i>Science</i> 244, no. 4910 (1989): 1275-81. Anderson, W. F. "Genetics and Human Malleability." <i>Hastings Cent Rep</i> 20, no. 1 (1990): 21-4.

			Weiss, Rick, and Deborah Nelson. "Teen Dies Undergoing Experimental Gene Therapy." <i>The Washington Post</i> , September 29, 1999, A01. Cavazzana-Calvo, M., A. Thrasher, and F. Mavilio. "The Future of Gene Therapy." <i>Nature</i> 427, no. 6977 (2004): 779-81.
22	Tue., 4/10	The Human Genome Project	McKusick, Victor A., and Frank H. Ruddle. "The Status of the Gene Map of the Human Chromosomes." <i>Science</i> 196, no. 4288 (1977): 390-405. Dulbecco, R. "A Turning Point in Cancer Research: Sequencing the Human Genome." <i>Science</i> 231, no. 4742 (1986): 1055-6. Lander, E. S., et al. "Initial Sequencing and Analysis of the Human Genome." <i>Nature</i> 409, no. 6822 (2001): 860-921. Read pp. 860-864, 911-914 and skim the rest. Venter, J. C., et al. "The Sequence of the Human Genome." <i>Science</i> 291, no. 5507 (2001): 1304-1351. Read: Intro, sec. 1 and sec. 2 (1304-1309); sec. 3.2 (1320-1321); secs. 8–8.4 (1345-1348).
	Wed., 4/11		Discussion
	Week 13:		
23	Mon., 4/16	'Ome sweet 'ome	Motulsky, Arno G. "Drug Reactions, Enzymes and Biochemical Genetics." <i>JAMA</i> 165 (1957): 835-37. Motulsky, Arno G. "Ecogenetics: Genetic Variation in Susceptibility to Environmental Agents." <i>Proceedings of the Fifth International Congress of Human Genetics Excerpta Medica</i> , Amsterdam (1977): 375-85 (skim for general idea; details not important). Nebert, D. W., and E. Bingham. "Pharmacogenomics: Out of the Lab and into the Community." <i>Trends Biotechnol</i> 19, no. 12 (2001): 519-23. Muller, M., and S. Kersten. "Nutrigenomics: Goals and Strategies." <i>Nat Rev Genet</i> 4 (2003): 315-22 (again, details not important—skim). Steiner, S., and N. L. Anderson. "Pharmaceutical Proteomics." <i>Ann N Y Acad Sci</i> 919 (2000): 48-51. Petsko, G. A. "No Place Like Ome." <i>Genome Biol</i> 3, no. 7 (2002): COMMENT1010.
24	Tue., 4/17	Personalized medicine	Draper, George. "The Relationship of Human Constitution to Disease." <i>Science</i> 61 (1925): 525-28. Snyder, Laurence H. "The Genetic Approach to Human Individuality." <i>Scientific Monthly</i> 68, no. 3 (1949): 165-71. Jimenez-Sanchez, G., B. Childs, and D. Valle. "Human Disease Genes." <i>Nature</i> 409, no. 6822 (2001): 853-5. Thrall, J. H. "Personalized Medicine." <i>Radiology</i> 231, no. 3 (2004): 613-616.
	Wed., 4/18		Discussion
	Week 14:		
25	Mon., 4/23	The DNA mystique	Nelkin and Lindee, <i>The DNA Mystique</i>
26	Tue., 4/24	Summary and conclusions	Nelkin and Lindee, <i>The DNA Mystique</i>
	Wed., 4/25		Discussion

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- Various. "Discussion of the advisability of the registration of tuberculosis." *Transactions and Studies of the College of Physicians of Philadelphia* 16 (1894): 1-27.
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