

# **History of Life Sciences in the Twentieth Century**

HISC 108

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Office Hours: Mondays 8.30-10.30, HSS 4040

From the rediscovery of Mendel's laws in 1900, through the elucidation of the double-helical structure of DNA in 1953, and culminating in the sequencing of the human genome in 2000, the twentieth century has rightly been called the Century of the Gene. This course narrates the trajectory of twentieth-century genetics, showing the way in which our understanding of nature is entangled with views about ourselves and about the social and political order. The greatest political calamities of modernity arose from irresponsible speculation about heredity and evolution, an episode in twentieth-century history that we are exhorted to 'never forget.' By exploring the history of breakthroughs in the quest to understand the laws of heredity, this class provides students with the deep background to our own fast-changing world. Standing at the brink of the age of genetic engineering – a craft whose tools and techniques are being refined right here at UCSD – it is important that we know where we have been before setting out to forge the future.

## **Class Requirements**

There are three short written assignments based on the class materials, plus a final project in which you have a choice between a scientifically- and historically-informed portfolio on your family background or an opinion piece about genetic engineering. The first assignment, due on Thursday of third week, will be a short take-home essay based on the lectures and readings for first week. The second assignment, due on Thursday of eighth week, will be a longer paper about the politics of heredity. The third assignment is a shorter paper on epigenetics. The portfolio final can be assembled from small research projects that will be assigned as we go along.

## **Readings**

The textbook for this class takes the form of a chapter for each week, based on my lecture notes, posted to the TritonEd site alongside the primary sources listed below:

### **1. Mendel**

Gregor Mendel, 1865, 'Experiments in Plant Hybridization,' trans. William Bateson, in *Classic Papers in Genetics*, ed. James A. Peters, Prentice Hall, Inc., 1959, pp. 1-19.

### **2. Darwin**

Charles Darwin, 1871, *The Descent of Man*, chapter 5, 'On the Development of the Intellectual and Moral Faculties.'

### **3. Mapping chromosomes**

Charles B. Davenport, 1921, 'Research in Eugenics,' *Science*, 54:1400, pp. 391-397

Morgan, Thomas Hunt, 1910, 'Sex Limited Inheritance in *Drosophila*' , in *Classic Papers in Genetics*, ed. James A. Peters, Prentice Hall, Inc., 1959, pp. 63-66.

### **4. Reforming the Race Concept**

Dobzhansky, Theodosius, 1962, *Mankind Evolving*, New Haven: Yale University Press, pp. 253-286

UNESCO, 1952, *The Race Concept, Results of an Inquiry* Paris: UNESCO, pp. 98-103

### **5. What is Life?**

James Watson and Francis Crick, 1953, *Molecular Structure of Nucleic Acids* in *Classic Papers in Genetics*, ed. James A. Peters, Prentice Hall, Inc., 1959, 241-243.

Francis Crick, 1970, Letter to Bernard Davis, April Crick Archive, Special Collections, Geisel Library, UCSD.

### **6. Atomic Eugenics**

Herman Muller, 1973, 'What Genetic Course Will Man Steer?' *Man's Future Birthright*, New York: SUNY Press, pp. 117-152

## **7. Human Evolution**

UNESCO, 1952, *The Race Concept, Results of an Inquiry* Paris: UNESCO, pp. 5-35

Michael Dodson and Robert Williamson, 1999, "Indigenous Peoples and the morality of the Human Genome Diversity Project" *Journal of Medical Ethics*, 25:204-208

Genographic project, ethics statement

## **8. Epigenetics**

Leslie A Pray, 2004, 'Epigenetics: genome, meet your environment' *The Scientist* July 5<sup>th</sup> 2004

Paul Tough, 'The Poverty Clinic,' *The New Yorker*, March 21<sup>st</sup>, 2011

## **9. Neuroplasticity**

Kandel, Eric, 2001, 'The Molecular Biology of Memory Storage: a Dialog Between Genes and Synapses' *Science*

Kandel, Eric, 2006, *In Search of Memory*, New York: Norton, pp. 3-11, 117-149

## **10. The CRISPR revolution**

Hilzik, Michael, 2017, "CRISPR pioneer Jennifer Doudna struggles with the ethical implications of what she has wrought," *L. A. Times*, July 21, 2017.