

Ethical Issues in Biochemical Research Spring 2021

11:115:321:01 *George Pieczenik, Ph.D., Professor*

Spring 2021

Day M,W Time 2:15-3:35

Online: GoToMeeting and Zoom

3 credits, meeting twice a week for 80 minutes

Course Description

This course will address ethical issues in biochemistry, with some focus on genetics and molecular biology. The course will consist of lectures by the professor, as well as student presentations on selected topics. Issues to be covered will include the ethics of recombinant DNA technology, of genetically modified plants and animals, of stem cell use, scientific patents, and of creating DNA databases. Other topics will include the political use of genetics and evolutionary paradigms, and the use of fraudulent data and “pseudo science”, and how these tools can be used to sway public opinion. Important issues facing scientists and students currently will also be discussed, such as plagiarism . data manipulation and consequences of the biotechnology revolution.

Course Requirements

- 1. Class Attendance & Participation:** Students are expected to attend class online and to participate actively. There will be spot quizzes. Unexcused absences (>3) will result in failure. (10%) Online class attendance will be through GoToMyMeeting and/or Zoom. Classes will be recorded and deposited to Dropbox for students who can not make the class synchronously.
- 2. Essays on assigned topics:** Students will present two power point topics assigned or requested. for presentation to the class. (70%)
- 3. Final exam;** A final take home 2 hour exam. (20%)

Optional reading list from which to prepare paper

The Main text is Edwin Black's - America's War on the Weak

Publisher: Four Walls Eight Windows; (September 2003)

ISBN: 1568582587

Rosalind Franklin: The Dark Lady of DNA by Brenda Maddox , Harper Collins 2002, UK

The Fraud of Abderhalden's Enzymes by Ute Deichmann and Benno Muller-Hill, Nature vol 393. (1998) p.109-11.-

Nazi Medicine- A film by John J. Michalczyk First Run Features , 153 Waverly Place, NY 10014

The Martyrdom of Jewish Physicians in Poland. Studies by Leon Wulman and Joseph Tenenbaum. Research and documentation by Leopold Lazarowitz and Simon Malowist. (New York: Published for Medical Alliance-Association of Jewish Physicians from Poland, by Exposition Press, 1964)

Murderous Science: Elimination by Scientific Selection of Jews, Gypsies, and Others in Germany, 1933-1945 by Benno Müller-Hill, Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY(1998)

Unit 731: Japan's Secret Biological Warfare in World War II

by Peter Williams and David Wallace. Free Press (1998)

Max Perutz- I Wish I Got You Angry Sooner- Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY , 2003.

For the Love of Enzymes: The Odyssey of a Biochemist by Arthur Kornberg , Harvard University Press, Cambridge, Mass. 1989.

The Double Helix by James Watson, , New American Library, Athenium, 1968

Imclone- American Sucker by David Denby, Back Bay Books, Time Warner Book Group, NY, NY 2004

Mauve, The Color That Changed the World - Perkins- Simon Garfield, WW Norton, NY, NY(2002)ISBN : 0393323137

Partners of the Heart- Vivian Thomas- Univ of Penn Press, Philadelphia, PA, (1985)

Polio: An American Story- David M. Oshinsky-Oxford University Press, 2005

Helen Brooke Taussig- First women Prof. John Hopkins, Tetrology of Fallot, Thalidomide babies.

http://www.nlm.nih.gov/changingthefaceofmedicine/physicians/biography_316.html

First Fruit- The Birth of Biotech Food- The Creation of Flavr Savr Tomato-Calgene- by Belinda Martineau-McGraw Hill, NY (2000)

The Art of Cloaking Ownership-The Secret Collaboration and Protection of the German War Industry by the Neutrals: The Case of Sweden by Gerard Aalders and Cees Wiebes- Amsterdam University Press (Amsterdam, Netherlands), 1996

Tuberculosis: The Greatest Story Never Told - The Search for the Cure and the New Global Threat - by Frank Ryan-Little Brown and Co. Boston, 1992

The Mismeasure of Man- Steven Jay Gould-W.W. Norton, NY, 1981

Bad Blood: The Tuskegee Syphilis Experiment, Revised Edition (Paperback)by James H. Jones - The Free Press, NY (1993)

Applied Eugenics-Paul Popenoe, Bibliobazaar, (2007) (1918)

Case of the Nazi Professor- David Oshinsky, Rutgers University Press (1989)

Our Posthuman Future- Francis Fukuyama (Farrar, Strauss and Giroux, NY, 2002

Schedule and Syllabus:

Week 1a- Plagiarism-Contemporary student issues with plagiarism- the use of the internet, turnitin.com, google.

Week 1b- Aaron Swartz- Issues of Copyright, Patent and Rally in Support of His Life's Work for Free Access to Internet Information.

Week 2a- Theories of Evolution and Eugenics Week
2 b- Development of IQ tests

Week 3a- Nazi Doctors Video and Unit 731- Col. Ishii “experiments” on Chinese prisoners.

Week 3b - Abderhalden- *abwehrfermente* – Protective Enzymes

Week 4a- Michaelis- Menton Equation- Michaelis disproving existence of Protective Enzymes-

Week 4b- *Numerus Clausus* quota’s at Harvard and Yale.- Consequence of the Quota System in the creation of the “Well-Rounded Applicant”

Week 5a- Something the Lord Made- Video- and Partners of the Heart, the creation of cardiac medicine with the Blalock-Taussig-Thomas shunt for Tetralogy of Fallot.

Week 5b- Bad Blood- Tuskegee Experiments on syphilis

Week 6a- Recombinant DNA issues- Asilomar Conference

Week 6b- Genetically engineered plants and products- Flavr Savr tomato, Calgene, tomato puree.

Week 7a- Monsanto Round-Up- violation of legal principle of Patent Exhaustion by courts.

Week 7b Vaccines versus Chemotherapeutics- Pasteur vs Fleming

Week 8a- TB- streptomycin vs BCG vaccine- Schatz, Waksman, Mayo Clinic, Rutgers

Week 8b- Albert Schatz Lecture- Video

Week 9a- Polio Vaccine- Covid Vaccine

Week 9b- HIV- vaccines- non-pathogenic competitive strains vs chemotherapeutics- antiviral drugs- reverse transcriptase inhibitors and protease inhibitors.

Week 10a- In Vitro Fertilization- embryo implantation-

Week 10b- Ethics and politics of Stem Cell therapy – cardiac repair, dental bone regeneration, other.

Week 11a- Legal Issues involving patenting life and DNA sequences – British Court, French Court vs US Courts- Rule 706, adversarial vs inquisitorial legal systems as related to patent issues.

Week 11b- Legal Issues on controlling the direction of science and wartime manufacture through patents, foreign and domestic

Week 12a – Developing vaccine for Covid 19

Week 12b- The evolution and development of a pandemic- Pathogeny recapitulates Epidemiology

Week 13a- Student Presentations

Week 13b- Student Presentations

Week 14a- Student Presentations

Week 14b- Student Presentations

Final Exam- 2 hrs.