

HOM 565: The Ethics of Modern Biotechnology
Final Syllabus
Fall 2001
Revised September 24, 2001
© 2001 Robert Streiffer

I. Administrative Information

Instructor: Professor Robert Streiffer
Lectures: B113 Van Vleck, Tuesday and Thursday, 1:00 – 2:15
Discussion Sections: 4185 Medical Sciences Center, Friday 1:00 – 1:50
Philosophy Office: 5123 Helen C. White Hall; 263 – 9479
Medical Ethics Office: 1411 Medical Sciences Center; 262 – 7490
Office Hours: Tuesday 2:15 – 3:30 in my Medical Ethics Office, and by appointment
E – mail: rstreiffer@facstaff.wisc.edu
Home Page: <http://philosophy.wisc.edu/streiffer/>
Credits: 4

II. Course Description, Objectives, Requirements, Paper Dates, and Materials

This course is for graduate students and upper-level undergraduates. It is an in-depth study of a selection of ethical issues arising from the application of modern biotechnology, especially modern agricultural biotechnology, to microorganisms, plants, and non-human animals. In contrast to much of the public, academic, and industry discussion on these issues, we will aim at a discussion that is informed both by scientific research and by work done in ethical theory, political philosophy, and other relevant disciplines, and whose character is rigorous, clear, nuanced, and unbiased. I do not consider myself either generally for or generally against agricultural biotechnology, but as a philosopher, I am against bad arguments wherever they are found.

The applications of biotechnology we discuss will vary from year to year, but will include such topics as bioremediation, biomining, bioterrorism, biomass energy production, pesticide producing plants, herbicide resistant plants, terminator technology, pharming, bovine growth hormone, xenotransplantation, virus resistant pests, ice-minus bacteria, value-added foods, patenting life, biopiracy, and transgenic animal models for human diseases and for xenotransplantation.

There are two overall goals of the course:

1. To improve your familiarity with the facts, concepts, theories, and arguments from the relevant scientific, ethical, and political literature.
2. To improve your ability to think about and discuss the ethical issues in this area.

More specifically, I expect you to be able to do the following by the end of the semester:

1. Be more appreciative of opposing viewpoints on controversial ethical questions.
2. Be clearer about your own views on these matters.
3. Define relevant scientific concepts.
4. Define relevant ethical concepts.
5. List the main applications of biotechnology which have raised ethical concerns.
6. Explain how recombinant DNA techniques are used in those applications.
7. List the main ethical worries for each of those applications.

8. Analyze the main arguments from the literature, pro and con, for each of those applications.
9. Assess the reasonableness of the scientific claims made in those arguments.
10. Assess the reasonableness of the ethical claims made in those arguments.
11. Integrate the discussion of science, ethics, and political philosophy to formulate a positive argument for or against applications of biotechnology.

Requirements:

1. Read all of the assignments, and read them critically. The average amount of reading per class is about 31 pages. In a small seminar, the contribution that each person makes to the discussions is important.
2. Attend all the lectures. I won't record attendance, but you will be expected to show familiarity with the lecture material in your papers.
3. Attend and participate in the discussion sections. You will be required to write up two discussion questions and bring them to the discussions sections. The questions, plus participation and attendance, are worth 20% of your grade.
4. Undergraduates: Two papers, 600 words (2 pages) in length, each worth 10% of your grade, and two papers 1500 – 1800 words (5 – 6 pages) in length, each worth 30% of your grade.
5. Graduate Students: Two papers, 600 words (2 pages) in length, each worth 10% of your grade, and then either two papers 2400 – 3000 words (8 – 10 pages) in length and each worth 30% of your grade, or a single term paper, 4800 – 6000 words (16 – 20 pages) in length, done in two drafts, and worth 60% of your grade. (By “a draft” I mean a draft of a complete paper, not a partial paper.)
6. Honors Students: An additional research project on a topic related to the course, to be presented in class.

Paper Dates

	Date Assigned	Date Due	Paper Length	Time
1	Tuesday, Oct. 2	Tuesday, Oct 9	600 words (2 pages)	1 week
2	Tuesday, Oct 16	Tuesday, Oct 23	600 words (2 pages)	1 week
3	Thursday, Nov 1	Thursday, Nov. 15	1500-1800 words (5 – 6 pages)	2.5 weeks
4	Tuesday, Nov. 20	Tuesday, Dec. 11	1500-1800 words (5 – 6 pages)	3 weeks

Materials:

The book, *The Ecological Risks of Engineered Crops*, by Jane Rissler and Margaret Mellon, will be available from the UW bookstore in time for us to use it. All other materials will be available through the Middleton Library E-reserves, which can be accessed through MadCat (login ID = health, password = health4), the Middleton regular reserves, and will also be compiled into a reader available for purchase at Bob's Copy Shop in University Square.

III. Course Schedule

1. Recombinant DNA Techniques (8 Meetings)

I will go over administrative details, provide an overview of the content and requirements of the course, and provide a brief history of biotechnology. After an introduction to the basics of recombinant DNA technology, we will evaluate some of the ethical arguments people were making in the early 1970s both for and against the use of recombinant DNA techniques.

Although rDNA techniques are now known to be quite safe, the arguments are interesting both because they provide a historical context to the current debate, and because many of the current arguments are similar in form to the ones given originally. We will explore such question as the following. Is all genetic engineering unnatural, and if it is, does that make it intrinsically wrong? To what extent is recombinant DNA research protected by the right to academic freedom? Is there a right of academic freedom to engage in research that the public perceives to be risky or morally objectionable? How should decisions be made under conditions of uncertainty? What grounds the state's right to restrict harmful activities? Is the fact that a group finds a kind of activity offensive legitimate grounds for the state to restrict that activity?

1. Tuesday, September 4
Course Overview, History of Biotechnology (1 Page)
 - Turning Point Project, "Who Plays God in the 21st Century." (1 page)
2. Thursday, September 6
Recombinant DNA Techniques ; The Unnaturalness Objection (36 Pages)
 - Michael J. Reiss and Roger Straughan, "The Practicalities of Genetic Engineering," Ch. 2 in *Improving Nature* (Cambridge: Cambridge University Press, 1996), 11 – 42 (32 pages)
 - Michael J. Reiss and Roger Straughan, "Extrinsic and Intrinsic Concerns," in *Improving Nature* (Cambridge: Cambridge University Press, 1996), 49 – 50 (2 pages)
 - Michael J. Reiss and Roger Straughan, "Intrinsic Concerns about Unnaturalness," in *Improving Nature* (Cambridge: Cambridge University Press, 1996), 59 – 60 (2 pages)

Tuesday, September 11—No Class

3. Thursday, September 13
On the Unnaturalness Objection I (32 Pages)
 - John Stuart Mill, *On Nature* (32 pages)
4. Tuesday, September 18
On the Unnaturalness Objection II (21 Pages)
 - Allan Millar, "Following Nature," in *The Philosophical Quarterly*, Vol. 38 No. 151, 165 – 185 (21 pages)
5. Thursday, September 20
On the Doomsday Argument I (15 Pages)
 - Paul Berg, D. Baltimore, and H. W. Boyer, "Potential Biohazards of Recombinant DNA Molecules," *Science* 185 (1974): 303 (1 page)
 - Sinsheimer, Robert L., "Two Lectures on Recombinant DNA Research," in *The Recombinant DNA Debate*, ed. by David A. Jackson and Stephen P. Stich (Englewood Cliffs, New Jersey: Prentice – Hall, Inc, 1979), 85 – 98 (14 pages)
6. Tuesday, September 25
On the Doomsday Argument II (19 Pages)
 - Stephen Stich, "The Recombinant DNA Debate: Some Philosophical Considerations," in *The Recombinant DNA Debate*, ed. by David A. Jackson and Stephen P. Stich (Englewood Cliffs, New Jersey: Prentice – Hall, Inc, 1979), 183 – 201 (19 pages)
7. Thursday, September 27
The Harm Principle (31 Pages)
 - Joel Feinberg, "General Introduction," in *Harm to Others*, by Joel Feinberg (New York: Oxford University Press, 1984), 3 – 29 (27 pages)
 - John Stuart Mill, "The Harm Principle," in *The Philosophy of Law*, edited by Frederick Schauer and Walter Sinnott-Armstrong (Fort Worth: Harcourt Brace College Publishers, 1996), 310 – 313 (4 pages)

8. Tuesday, October 2
The Offense Principle (34 Pages)
First paper topics handed out, due on Tuesday, October 9
- Judith Jarvis Thomson, “Distress and Harm,” Ch. 10 in *The Realm of Rights* (Cambridge, Massachusetts: Harvard University Press, 1990), 249 – 269 (21 pages)
 - Joel Feinberg, “The Offense Principle,” in *Social and Political Philosophy*, edited by George Sher and Baruch A. Brody (Fort Worth: Harcourt Brace College Publishers, 1996), 84 – 96 (13 pages)

2. Animal Biotechnology (4 Meetings)

In this section, we will survey the techniques and uses of animal biotechnology, and evaluate some of the concerns that have been expressed about them. We will look at arguments for and against the view that animals have rights, the ethical justifiability of their use in medical experimentation, and the ethical justifiability of using genetic engineering to change an animal’s nature to better suite our needs, perhaps at the expense of the animal’s own welfare.

Thursday, October 4 — Tour of the UW Biotech Center and Transgenic Animal Facility:
Observe the introduction of genetically engineered mouse stem cells into a mouse blastocyst.

9. Friday, October 5
Uses and Techniques of Animal Biotechnology (21 Pages)
- Sheldon Krimsky and Roger Wrubel, “Transgenic Animals,” Ch. 10 in *Agricultural Biotechnology and the Environment* (Urbana: University of Illinois Press, 1996), 191 – 211 (21 pages)
10. Tuesday, October 9
Animal Rights (23 Pages)
First paper topic due at the beginning of class
- Tom Regan, “The Case for Animal Rights,” in *Contemporary Moral Problems*, ed. James E. White (Belmont, CA: Wadsworth Publishing Company, 2000), 500 – 508 (9 pages)
 - Tibor R. Machan, “Do Animals Have Rights?” in *Contemporary Moral Problems*, ed. James E. White (Belmont, CA: Wadsworth Publishing Company, 2000), 509 – 515 (7 pages)
 - Marry Anne Warren, “Difficulties with the Strong Animal Rights Position,” in *Contemporary Moral Problems*, ed. James E. White (Belmont, CA: Wadsworth Publishing Company, 2000), 516 – 522 (7 pages)
 - Handed out in class: Gary Varner, *In Nature’s Interests*, pp-pp (x pages)
 - Handed out in class: Peter Singer, *Animal Liberation*, pp-pp (x pages)
11. Thursday, October 11
The Use of Animals in Medical Experimentation (31 Pages)
- R. G. Frey, “Medicine, Animal Experimentation, and the Moral Problem of Unfortunate Humans,” in *Scientific Innovation, Philosophy, and Public Policy*, eds. by Ellen Frankel Paul, Fred D. Miller, Jr., and Jeffrey Paul (Cambridge: Cambridge University Press, 1996), 181 – 211 (31 pages)
 - Handed out in class: Peter Singer, *Animal Liberation* (New York: New York Review of Books, 1990), pictures (10 pages)
 - Handed out in class: Gary Varner, *In Nature’s Interests* (Oxford: Oxford University Press, 98), 53 (1 page)

12. Tuesday, October 16
The Integrity Argument (27 Pages)
Second paper topics handed out, due on Tuesday, October 23
- David E. Cooper, “Intervention, Humility, and Animal Integrity,” Ch. 11 in *Animal Biotechnology and Ethics*, eds. Alan Holland and Andrew Johnson (London: Chapman and Hall, 1998), 145 – 155 (11 pages)
 - Bernard E. Rollin, “On Telos and Genetic Engineering,” Ch. 12 in *Animal Biotechnology and Ethics*, eds. Alan Holland and Andrew Johnson (London: Chapman and Hall, 1998), 156 – 171 (16 pages)
3. Plant Biotechnology (10 Meetings)
- In this section, we will explore various theories regarding the duties we have to plants, species, and the environment, we will familiarize ourselves with the current applications and regulations of plant biotechnology, and we will explore views about the role of experts and of public opinion in a democracy. With that framework as background, we will then examine issues regarding environmental risk, food safety, labeling, humanitarian uses of agricultural biotechnology, and agro- and eco-terrorism.
13. Thursday, October 18
Our Moral Duties to the Environment I (37 Pages)
- Joel Feinberg, “The Rights of Animals and Unborn Generations,” in *Philosophy and Environmental Crisis*, edited by William T. Blackstone (Athens: University of Georgia Press, 1974), 43-57, 62-67 (19 pages)
 - Kenneth E. Goodpaster, “On Being Morally Considerable,” in *The Journal of Philosophy* 75 (June 1978): 308 – 325 (18 pages)
14. Tuesday, October 23
Our Moral Duties to the Environment II (40 Pages)
Second paper topic due at the beginning of class
- J. Baird Callicott, “The Search for an Environmental Ethic,” Ch. 10 in *Matters of Life and Death*, edited by Tom Regan (New York: Random House, 1986), 381-420 (40 pages)
- Thursday, October 25 — No Class
15. Tuesday, October 30
Current EPA and USDA Regulations; Environmental Risks of Genetically Engineered Crops I (34 Pages)
Third paper topic will be handed out, due Thursday, November 15
- Neil A. Belson, “U. S. Regulation of Agricultural Biotechnology: An Overview,” in *AgBioForum* 3 (2000): 268 – 274, 277 - 280 (8 pages)
 - Jane Rissler and Margaret Mellon, Chs. 1 - 2 in *The Ecological Risks of Engineered Crops* (Cambridge: MIT Press, 1996), 1 - 26 (26 pages)
 - Handed out in class: John E. Losey, Linda S. Rayor, and Maureen E. Carter, “Transgenic Pollen Harms Monarch Larvae,” *Nature* 399 (20 May 1999): 214 (1 page)
 - Handed out in class: Jeannie L. Phipps, “EPA OKs Gene-Altered Bt Corn,” *Yahoo! News*, October 19, 2001, available at http://dailynews.yahoo.com/h/hsn/20011018/hl/epa_oks_gene-altered_bt_corn_1.html (2 pages)
 - Handed out in class: Carol Kaesuk Yoon, “Genetic Modification Taints Corn in Mexico,” in *New York Times*, October 2, 2001 (2 pages)

16. Thursday, November 1
Environmental Risks of Genetically Engineered Crops II (44 Pages)
- Jane Rissler and Margaret Mellon, Ch. 3 in *The Ecological Risks of Engineered Crops* (Cambridge: MIT Press, 1996), 27 - 70 (44 pages)
 - Handed out in class: Leora Broyda Vestel, "The Next Pig Thing," in *Mother Jones*, October 26, 2001, available at http://www.motherjones.com/web_exclusives/features/news/enviropig.html (2 pages)
 - Handed out in class: Minnesota Daily, "Enviropigs will not help environment," editorial in the *Minnesota Daily*, October 30, 2001 (1 page)
17. Tuesday, November 6
Environmental Risks of Genetically Engineered Crops III (58 Pages)
- Jane Rissler and Margaret Mellon, Chs. 4 - 6 in *The Ecological Risks of Engineered Crops* (Cambridge: MIT Press, 1996), 71 - 128 (58 pages)
18. Thursday, November 8
The FDA and the Role of Experts in a Democracy (38 Pages)
- FDA, "FDA's Policy for Foods Developed by Biotechnology," <http://vm.cfsan.fda.gov/~lrd/biopolcy.html>, 1995 (5 pages)
 - FDA, "FDA Announces Proposal and Draft Guidance for Food Developed through Biotechnology," <http://www.cfsan.fda.gov/~lrd/hhbioen3.html>, January 17, 2001. (1 page)
 - For reference only: FDA, "List of Completed Consultations on Bioengineered Foods," <http://vm.cfsan.fda.gov/~lrd/biocon.html>, July 2001 (6 pages)
 - Paul Thompson, "Food Safety and the Ethics of Consent," Ch. 4 in *Food Biotechnology in Ethical Perspective* (London: Blackie Academic and Professional, 1997): 57 - 75 (19 pages)
 - Robert Dahl, "Guardianship," Ch. 4 in *Democracy and Its Critics* by Robert Dahl (New Haven: Yale University Press, 1989), 52 - 64 (13 pages)
 - Handed out in class: Marion Nestle, "Allergies to Transgenic Foods—Questions of Policy," in the *New England Journal of Medicine*, 334: 726-728 (3 pages)
 - Handed out in class: Julie A. Nordlee, et. al., "Identification of a Brazil-Nut Allergen in Transgenic Soybeans," in the *New England Journal of Medicine*, 334: 688-692 (3 pages)
 - Handed out in class: Eichenwald, Kurt; Kolata, Gina; Peters on, Melody, "Biotechnology Food: From the Lab to a Debacle," in *The New York Times*, January 25, 2001 (9 Pages)
19. Tuesday, November 13
Labeling and the Role of Preferences in a Democracy (34 Pages)
- Robert Dahl, "Is Political Equality Justified," Ch. 4 in *Controlling Nuclear Weapons*, by Robert Dahl (Syracuse: Syracuse University Press, 1985) 53 - 68 (16 pages)
 - Paul Thompson, "Food Safety and the Ethics of Consent," Ch. 4 in *Food Biotechnology in Ethical Perspective* (London: Blackie Academic and Professional, 1997): 75 - 80 (6 pages)
 - "Genetically Engineered Food Right to Know Act," available at <http://www.thecampaign.org/HR3377.htm> (6 pages)
 - Alan McHughen, "Misinformation and the Choice Paradox," in *Nature Biotechnology* 18 (October 2000) 1018 - 1019 (2 pages)
 - U. S. Food and Drug Administration, "Guidance for Industry: Voluntary Labeling Indicating Whether Foods Have or Have Not Been Developed Using Bioengineering," Draft of January 2001 (4 pages)

20. Thursday, November 15
Humanitarian Concerns I (31 Pages)
Third paper topic due at the beginning of class
- Peter Singer, “Famine, Affluence, and Morality,” in *Philosophy and Public Affairs* 1 (Spring 1972): 229 – 243 (15 pages)
 - Maarten J. Chrispeels, “Biotechnology and the Poor,” in *Plant Physiology* 124 (September 2000): 3 – 6 (4 pages)
 - Ingo Potrykus, “The “Golden – Rice” Tale” (12 pages)
21. Tuesday, November 20
Humanitarian Concerns II (30 Pages)
Fourth paper topic distributed, due on Tuesday, December 11
- Kimbrell, Andrew, “Why Biotechnology and High-Tech Agriculture Cannot Feed the World,” in *The Ecologist* 28 (September/October 1998): 294 – 298 (5 pages)
 - Greenpeace, “Golden Rice is Fool’s Gold,” http://www.biotech-info.net/fools_gold.html (1 page)
 - Greenpeace, “Genetically Engineered Pro-Vitamin A Rice,” <http://a288.g.akamai.net/7/288/1533/5d028232b3b6de/www.greenpeace.org/%7Egeneng/reports/food/GRice.pdf>, (2 pages)
 - Vandana Shiva, “Genetically Engineered Vitamin ‘A’ Rice: A Blind Approach to Blindness Prevention,” http://www.biotech-info.net/blind_rice.html (2 pages)
 - Ingo Potrykus, “Response to Greenpeace,” http://www.biotech-info.net/IP_response.html (1 page)
 - Case Study Materials on Golden Rice (19 pages)

Thursday, November 22 — No Class (Thanksgiving Holiday)

22. Tuesday, November 27
Agro- and Eco-terrorism (42 Pages)
- Kim Murphy, “Eco-terror Groups Fights Fire with Fire, More Fire,” in *The Denver Post*, May 2, 2000 (4 pages)
 - Bioengineering Action Network, “The Cross – Pollinator #1, Harvest, 1999,” <http://www.greens.org/s-r/gga/ban.html> (3 pages)
 - “Activists Destroy GE Crops at Research Facility in Brentwood, CA,” *Genetix Alert News Release*, May 17, 2001, <http://ban.tao.ca/501ARbrentwood.htm> (2 pages)
 - “The Nighttime Gardener,” <http://ban.tao.ca/1299nighttimegardener.htm> (6 pages)
 - Ronald Dworkin, “Civil Disobedience and Nuclear Protest,” in *A Matter of Principle* by Ronald Dworkin, 104 – 119 (16 pages)
 - Michael Martin, “Ecosabotage and Civil Disobedience,” in *Radical Environmentalism*, edited by Peter C. List (Belmont: Wadsworth Publishing Company, 1993) 255 – 265 (11 pages).

4. Patents and Biotechnology (4 Meetings)

In this section, we will look at the patent law system and the main court cases involving biotechnology. We will address such questions as the following. What, if anything, ethically justifies the patent law system? What rights do developing countries have to compensation for the use of their plant genetic resources? Does allowing life patents encourage harm to the environment or show improper respect for life?

23. Thursday, November 29
Biotechnology Patenting (35 Pages)
- Robert Merges, “Introduction to the Patent Act,” Ch 2. § A in *Patent Law and Policy* (Charlottesville, Virginia: Michie Law Publishers, 1997), 51 – 61 (11 pages)

- Robert Merges, “Natural Substances and Living Things, “ Ch. 2 §D Subsections 1 - 3 in *Patent Law and Policy* (Charlottesville, Virginia: Michie Law Publishers, 1997), 157 – 180 (24 pages)
24. Tuesday, December 4
A Critique of the Utilitarian Argument for Patents (32 Pages)
- Michele Svatos, “Biotechnology and the Utilitarian Argument for Patents,” in *Scientific Innovation, Philosophy, and Public Policy*, eds. by Ellen Frankel Paul, Fred D. Miller, Jr., and Jeffrey Paul (Cambridge: Cambridge University Press, 1996), 113 – 144 (32 pages)
25. Thursday, December 6
Intellectual Property and Developing Countries (20 Pages)
- Hope Stand, “There is a Conflict Between Intellectual Property Rights and the Rights of Farmers in Developing Countries,” in the *Journal of Agricultural and Environmental Ethics*: 1991 131 – 142 (12 pages)
 - Sidney B. Williams, Jr., “There is Not a Conflict Between Intellectual Property Rights and the Rights of Farmers in Developing Countries,” in the *Journal of Agricultural and Environmental Ethics*: 1991 143 – 150 (8 pages)
26. Tuesday, December 11
Patenting Living Organisms (49 Pages)
Fourth paper topic due at the beginning of class
- Ned Hettinger, “Patenting Life: Biotechnology, Intellectual Property, and Environmental Ethics” in the *Boston College Environmental Affairs Law Review* 267 (Winter 1995) (29 pages)
 - R. Stephen Crespi, Ch. 26 in *Biotechnology, Morality, and Patents*, edited by Sigrid Sterkx (Burlington, Vermont: Ashgate Publishing Company, 2000) 277 – 296 (20 pages)
27. Thursday, December 13
Bioterrorism (34 Pages)
- George W. Christopher, Theodore J. Cieslak, Julie A. Pavlin, and Edward M. Eitzen, Jr., “Biological Warfare: A Historical Perspective,” in *Biological Weapons: Limiting the Threat*, edited by Joshua Lederberg (Cambridge, Massachusetts: The MIT Press) 17 – 35 (19 pages)
 - Andrew Valls, “Can Terrorism Be Justified?,” in *Ethics in International Affairs: Theories and Cases* (Lanham: Rowman and Littlefield Publishers, Inc.) 65 – 79 (15 pages)