

## **.MHB 565: The Ethics of Modern Biotechnology**

**Syllabus, Spring 2006**  
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### **A. Administrative Information**

Instructor: Professor Robert Streiffer

Lectures: 155 Van Hise, Monday, 2:25-4:55 (15 minute break at 3:30)

Office Hours: Wednesday 2:00-3:00 in my philosophy office, and also by appointment

Philosophy Office: 5123 Helen C. White Hall; 263-9479

Bioethics Office: 1411 Medical Sciences Center; 262-7490

E-Mail: [rstreiffer@wisc.edu](mailto:rstreiffer@wisc.edu); Home page: <http://philosophy.wisc.edu/streiffer/>

### **B. Course Description**

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 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 biotechnology. As a philosopher, however, I am against bad arguments wherever they are found.

### **B. Materials:**

- Reading packet available for purchase at Bob's Copy Shop in University Square (257-4536)
- Handouts and news articles distributed in class
- For additional biotech research on the web, two good sources are:  
<http://www.biotech.wisc.edu/seebiotech/seemail/index.html> (for news)  
<http://www.library.wisc.edu/guides/Biology/gmo.htm>

### **D. Objectives**

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:

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

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

### E. Grading Plan:

I use the following grading scale, with your final numerical grade rounded to the nearest letter grade:

Letter Grade	Numerical Equivalent
A	4
AB	3.5
B	3
BC	2.5
C	2
D	1
F	0

### F. Requirements:

- Read all of the assignments, read them carefully, and read them critically. Come to class ready to discuss the material. The contribution that each person makes to the discussion is important.
- Attend all the classes. I will be taking attendance, both to track attendance and to help me learn your names. Attendance will count as 10% of your final grade. Any excused absences for reasons other than an emergency must be cleared in advance of the class missed. For all excused absences, you must send me an e-mail stating the date and the reason so that I will have a record of it when it comes time to calculate your final grade. Any unexcused absence will affect your attendance grade as follows:

1 absence	B
2 absences	C
3 absences	D
4 absences	Fail the class

- Participate in class discussions. Class participation will count for 10% of your grade.
- Undergraduate papers: one shorter paper and two longer papers, per the schedule below.
- Graduate student papers: one shorter paper, and a choice between two longer papers or one term paper in two drafts. By “draft” I mean a draft of a complete paper, not a partial paper. For the two longer papers or the term paper, you may choose your own topic so long as you discuss it with me beforehand. Although the graduate student papers are not necessarily longer than the undergraduate papers, I will hold them to higher standards of clarity, rigor, and conciseness.
- Late Paper Policy: You must hand in all the papers in order to pass this course. You may not elect to opt out of a paper and receive an F on it. Papers are due at the beginning of

class on the due date. Papers handed in during class but after the beginning of class will be bumped to the next letter grade or half-letter grade down (e.g., from an A to an AB, from a C to a D.) After that, the penalty is one full letter grade per 24 hours. Any non-emergency extensions must be requested prior to the due date, and will be granted only in rare circumstances. Although you are encouraged to discuss your papers with friends and classmates, no group work is allowed.

**G. Undergraduate Paper Dates:**

	Assigned	Due	Paper Length	Grade
1	Jan 30	Feb 6	575-625 words (2 pages)	10%
2	March 6	March 27	1,450-1,550 words (5 pages)	35%
3	April 17	May 5	1,450-1,550 words (5 pages)	35%

**H. Graduate Student Paper Dates:**

	Assigned	Due	Paper Length	Grade
1	Jan 30	Feb 6	575-625 words (2 pages)	10%
2	March 6	March 27	First draft 2,400-3,000 words (8-10 pages); or 2,050-2,150 words (7 pages)	NA/35%
3	April 17	May 5	Final draft 4,075-4,325 words (14 pages); or 2,050-2,150 words (7 pages)	70%/35%

**I. Additional Class Policies**

Academic misconduct: Please note that the imposition of any penalty for any kind of academic misconduct (e.g., plagiarism, trying to get credit for a class you didn't attend, etc.) results in a permanent note that goes into your academic file, and that UW will disclose the fact that you were penalized for academic misconduct to interested parties who request that information.

Exceptions to the rules: I will not grant anyone an exception to the rules outlined in this syllabus unless that exception is granted to everyone. This means, for example, that since I can't commit to allowing everyone the option of rewriting their paper, I can't allow anyone the option of rewriting their paper.

Classroom Etiquette: You are expected to behave in ways that are appropriate and respectful to the professor and the other students. This includes, but is not limited to

1. Arriving on time. Students who walk into the classroom late create a distraction.
2. Refraining from private conversations with classmates during lecture or discussion.
3. Being patient and courteous to other students when they ask a question or make a comment.
4. Expressing disagreement with the comments of others in a respectful manner.
5. Removing sunglasses and hats.
6. Staying awake.
7. Refraining from reading any non-course-related material.
8. Refraining from packing up until class is completely over.
9. Turn any beepers or cell phones off when entering class.

**J. Outside Resources for Help**

The Writing Center has several classes and numerous handouts on academic writing. They will also do provide individual writing instruction. Appointments can be made by stopping in at 6171 Helen C. White or calling 263-1992. Their web site is [www.wisc.edu/writing](http://www.wisc.edu/writing). They can be much more effective if you approach them early in the writing process.

Study Skills: UW, as well as many other universities, have on-line materials available on how to improve your study skills as an undergraduate, and I encourage you to take a look at the URLs below and try to benefit from them.

[http://guts.studentorg.wisc.edu/SS/sshome.htm](http://guts.studentorg.wisc.edu/SS/sshhome.htm)

[http://www.stanford.edu/dept/undergrad/uac/resources/study\\_skills.html](http://www.stanford.edu/dept/undergrad/uac/resources/study_skills.html).

## K. Course Schedule

### I. Recombinant DNA Techniques (4 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? What does it mean to say that an activity is unnatural, anyway? 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 a legitimate reason for the state to restrict that activity?

#### 1. Monday, January 23

Course Introduction, Logic and Ethics, Recombinant DNA Techniques

- 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)

#### 2. Monday, January 30

First paper topics handed out

Intrinsic Objections

- 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), 59-64 (7 pages)
- John Stuart Mill, "On Nature" (32 pages)
- Allan Millar, "Following Nature," in *The Philosophical Quarterly*, Vol. 38 No. 151 (1988), 165-185 (21 pages)

#### 3. Monday, February 6

First paper topics due at the beginning of class

Extrinsic Objections

- 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)
- 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)

**4. Monday, February 13**

## Principles of Legitimate Regulation

- Joel Feinberg, §§ 1-4 and “Definitions of Liberty-Limiting Principles,” from “General Introduction,” in *Harm to Others*, by Joel Feinberg (New York: Oxford University Press, 1984), 3-14, 26-27 (12 pages)
- John Stuart Mill, “Of the Limits to the Authority of Society over the Individual” Ch. 4 in *On Liberty* (New York: W.W. Norton and Company, 1997), 99-114 (16 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)

**II. Plant Biotechnology (3 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, labeling, and humanitarian uses of agricultural biotechnology.

**5. Monday, February 20**

## Environmental Ethics and Genetically Engineered Crops

- 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)
- L. L. Wolfenbarger and P. R. Phifer, “The Ecological Risks and Benefits of Genetically Engineered Plants,” *Science* 290 (15 Dec 2000), 2088-2093 (6 pages)
- Dane Scott, “The Magic Bullet Criticism of Agricultural Biotechnology,” in *The Journal of Agricultural and Environmental Ethics* (2005) 18: 259-267 (12 pages)

**6. Monday, February 27**

## Scientific Expertise and Public Preferences in a Democracy

- 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)
- Alan McHughen, “Uninformation and the Choice Paradox,” in *Nature Biotechnology* 18 (October 2000) 1018-1019 (2 pages)
- Robert Streiffer and Alan Rubel, “Democratic Principles and Mandatory Labeling of GE Food,” in *Public Affairs Quarterly* Volume 13, Number 3 (2004), 223-248 (26 pages)

**7. Monday, March 6**

## Second paper topics handed out

## The Humanitarian Argument for Agricultural Biotechnology

- Peter Singer, “Famine, Affluence, and Morality,” in *Philosophy and Public Affairs* 1 (Spring 1972), 229-243 (15 pages)
- Ingo Potrykus, “The “Golden-Rice” Tale” (16 pages)
- Greenpeace, “Golden Rice is Fool’s Gold,” [http://www.biotech-info.net/fools\\_gold.html](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](http://www.biotech-info.net/blind_rice.html) (2 pages)
- Ingo Potrykus, “Response to Greenpeace,” [http://www.biotech-info.net/IP\\_response.html](http://www.biotech-info.net/IP_response.html) (2 pages)

### **Monday, March 13: Spring Break**

### **III. Animal Biotechnology (3 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 about the moral status of animals, the ethical justifiability of their use as food or 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.

#### **8. Monday, March 20**

Uses and Techniques of Animal Biotechnology, Moral Status of Animals

- 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)
- Immanuel Kant, “Our Duties to Animals,” in *Contemporary Moral Problems*, ed. James E. White (Belmont, CA: Wadsworth Publishing Company, 2000), 489-490 (2 pages)
- Peter Singer, “All Animals Are Equal,” in *Contemporary Moral Problems*, ed. James E. White (Belmont, CA: Wadsworth Publishing Company, 2000), 490-499 (10 pages)
- 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)

#### **9. Monday, March 27**

Second paper topics or rough drafts due at the beginning of class  
Duties to Animals Beyond Welfare?

- 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)
- Sara Gavrell Ortiz, “Beyond Welfare: Animal Integrity, Animal Dignity, and Genetic Engineering” *Ethics and the Environment* 9(1) 2004, 94-120 (27 pages)

#### **10. Monday, April 3**

Chimeras

- Jason Robert and Francoise Baylis, “Crossing Species Boundaries,” in *The American Journal of Bioethics* 3 (3) 1-13 (13 pages).

- Robert Streiffer, “In Defense of the Moral Relevance of Species Boundaries”, in *The American Journal of Bioethics* 3 (3) 37-38 (2 pages)
- Robert Streiffer, “At the Edge of Humanity: Human Stem Cells, Chimeras, and Moral Status,” *Kennedy Institute of Ethics Journal*

#### IV. Biotechnology and Intellectual Property (3 Meetings)

##### 11. Monday, April 10

Biotechnology Patenting

- 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)
- Ned Hettinger, “Justifying Intellectual Property,” *Philosophy and Public Affairs*, Volume 18, Issue 1 (Winter, 1989), 31-52 (22 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)

##### 12. Monday, April 17

Third paper topics handed out

Intellectual Property and Traditional Cultures

- Hope Shand, “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)
- Robert Streiffer, “An Ethical Analysis of Ojibway Objections to Genetics and Genomics Research on Wild Rice,” *Philosophy in the Contemporary World* Volume 12, Number 2 (Summer 2005), 37-45 (9 pages)

##### 13. Monday, April 24

Patenting Living Organisms

- Ned Hettinger, “Patenting Life: Biotechnology, Intellectual Property, and Environmental Ethics” in the *Boston College Environmental Affairs Law Review* 267 (Winter 1995) (29 pages)
- Jan Van Rompaey, Ch. 17 in *Biotechnology, Morality, and Patents*, edited by Sigrid Sterkx (Burlington, Vermont: Ashgate Publishing Company, 2000) 237-242 (6 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)

##### 14. Monday, May 1

Third paper topics or final draft due  
Review and Overflow