

**Bioethics and Genetic Research:
Selected History and Essential
Premises**

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What is Bioethics? definitions, origins, participants, and practices

- **Bioethics is the study of problems of moral values in the life sciences;**
- **It is not advocacy of specific conclusions but reflection on underlying questions and on implications of new developments;**
- **Bioethicists aspire to stimulate constructive debate and a degree of consensus.**
- **Both an empirical (descriptive) and a normative (regulatory and directive) aspect.**

Framing ethical questions: Ontology, episteme, process & telos

- What is the good act and what makes it so?
- Who will benefit and who risks harm?
- What ought count as valuable truth?
- What kind of people are the bearers of truth?
- What is the relationship between expertise and authority?
- What sort of social world is implied by the technology?
- What is the proper goal of medicine?
- Is the process of creating the technology transparent, rational and fair?
- How is the process linked to the telic premise?

I. Bioethics as professional self-criticism and self-discipline

•What are the ethical limits of research?

•1953--Watson and Crick, Franklin and others obliquely recognize social implications of determination of double helix as symmetric sequence of base pairs

•Early 1970s--Consensus emerges that human germline engineering should not be performed

1970s experiments with rDNA technology led to concerns about public health consequences

Genetics and the Legacy of Asilomar

- **1973-- the Singer-Soll letter to Science raised new concerns from within the field itself.**
- **1974-- National Academy of Sciences called for moratorium on certain types of rDNA procedures until hazards could be assessed.**
- **1975-- At conference held in Asilomar, CA, researchers established guidelines for *themselves* that focused on safety issues and required working with disabled viruses that could not survive outside of the lab; persuaded congress that legislation was not needed.**

- **Strategy was to focus on preventing foreseeable risks and to take a very conservative approach until they could be better understood**

•Asilomar was unique as a self-generated moratorium and voluntary response by the scientific community

•1975-1980 and beyond: ongoing oversight provided by the interdisciplinary NIH recombinant DNA Advisory Committee

•1982--President's Commission on Ethical Problems in Medicine affirms this consensus in its report on "Splicing Life"

Quick Historical Points to Consider

- Ethical issues have long been a part of research on recombinant DNA
- 1973 Asilomar → RAC → **safety as main concern**
- RAC lead to Appendix M “Points to Consider in the Design and Submission of Protocols for the Transfer of Recombinant DNA Molecules into One or More Human Research Participants”
- RAC also led to Biosafety Committees and Guidelines for accidents in the lab

Federal Rules were complex and detailed—ran across agencies

- EPA modeling for release of microbes and studying TSCA implications
- Dept of Agriculture does inspection and certification of rDNA (foot to mouth virus, nematodes , plant germ plasm)
- FTC may regulate deceptive practices
- CDC has a 24 hour hotline for reports of leakages in shipping of agents if interstate
- NIOSH and OSHA funded for research on worker safety—no regulatory plans
- DOT may regulate rDNA as hazardous material
- Dept of Commerce and National Board of Standards may regulate by products in feedstocks. They also regulate patents, trade secrets
- State Department worked with UN
- DOE has regulations
- NSF committees suggested regulations (Law and Social Sciences and Ethics and Values in Science and Technology(EVIST))
- NAS grants and committees
- OTC studies

All clinical GTR protocols connected with institutions that receive federal funding use casuistic model at local and national level

- What are potential harms and benefits to research subjects?
- How will potential harms and benefits be communicated so they can consent?
- How will selection among research subjects be made?
- How will privacy and confidentiality be preserved?

(Leroy Walters)

III. Bioethics as reform after scandal and tragedy

•1966--Henry Beecher, professor of anesthesiology at Harvard Medical School, published a paper in the New England Journal of Medicine in which he claimed to have found at least 22 examples of ethically dubious research in the published literature

•1999—Jesse Gelsinger, 18 y.o., died in a Phase 1 gene therapy trial at the University of Pennsylvania, where he was a subject in research on OTC deficiency; the adenovirus vector apparently stimulated a massive immune system response

•When Gelsinger consented to undergo gene therapy they were not told that several primates had died in animal trials

•One of the principal investigators had ties to a company he founded that has rights to his discoveries, leading to charges of conflict of interest

•Changes in the protocol were not submitted to NIH for review

•As a result of this death, several human gene therapy programs imposed a moratorium on clinical trials until the full circumstances were understood

III. Bioethics as moral uncertainty in a pluralistic society as we reflect on new issues science.

- “Scientist deliberately created Armageddon bird flu virus! Lab says ‘publish!’”
- “But others argue the virus should never have been created – and warn the potential if it escaped from the lab is ‘staggering’. There are also fears the recipe will be seized on by terrorists looking for a biological weapon.”
 - “National Science Advisory Board for Biosecurity chairman Paul Kiem, an anthrax expert, said: ‘I can’t think of another pathogenic organism that is as scary as this one. I don’t think anthrax is scary at all compared to this.’”

How to regulate research?

- As power of molecular biology shifts from observation to manipulation, issues of markets, dual use and error are reconsidered
- Linked to generational shifts in how power is organized in labs
- Linked to shift in science as a social act (Polio to artificial growth hormone)

Classic Moral Analysis

Appeal to Consequences (beneficence, non-maleficence)

Appeal to Duties & Rights (autonomy)

Appeal to Virtues (veracity, fidelity, integrity, courage)

Appeal to Justice (fairness, equity, attention to vulnerability)

Appeal to Solidarity (community, sociability, social contracts)

Opposition largely focus on two opposite views of the future (paradoxically held at the same time)

- That the technology will be a terrifying disaster!
 - Error (Japan)
 - Unintended consequences (mongoose)
 - Use as a weapon of mass destruction
- That the technology will be ***very good indeed*** and ordinary people will not get enough of it!
 - Two societies, enhanced and wild type
 - Oppression and marginalization of the poor

and an essential confusion about
“nature”



Such concerns reflect core concerns

Classic ideas

- a. that the world is terrifyingly mutable and unfixed in its borders and caprices and species
- b. that Pandora is trouble
- c. god-person boundary is at stake at all times

Modern anxieties

- a. “What I cannot make I cannot understand”
- b. That beings are really a sort of machine with a parts list, that we live in LegoLand and that we make not be able to put it back correctly
- c. This sort of knowledge is partial and synthetic—what is lost to us is the pre-textual past where in the Real lies.

Decophilia

- And a problem of unfulfilled (very big) promises made under unrealistic time periods
- And a confusion about what “experiment” means.
- And a cascade of news media reports about new therapies
- And a general lumping of all genetic intervention into one large metatrophic synecdoche

All of these claims have some real validity

- First, all of them are more than trivially correct, and any sensible person could agree with many of these statements.
- Trouble begins here is their extremity when taken to their logical conclusion.
- These claims create new political alliances

All of these claims are faith based

Debates confuse expertise with authority

They are statements of world view and eschatology, not of moral arguments. As such, they will not—cannot—be entirely agreed upon in a pluralistic democracy.

Like many faith claims in our world, they are eschatological in nature (it is not now, it is Then)

Charting a future course

- A period of new optimism after a “20 year record of unbroken failure...” (New York Times Nicholas Wade, 2011)

Correlative Relationship between Rights and Duties

- Meaning: society's trust in science's subversive activities means we allow (and pay) them to undermine the text and to "live outside the law."
- But: we have to trust that they are honest, careful, and sane.
- Right to free speech draws power and authority only from duty to "tell the truth and stand up for all humanity." (Sydney Brenner)

Regarding the margins of the field

- Final frame for research is **justice**
- All funding is a rationing of social goods toward you and not something or someone else
- Who chooses? Who benefits?
- What is the role of pro bono science?
- What is the role of virtues like altruism? Courage? Fidelity?

Small aside for bioethics

- Must also avoid hype and speculation
- Must listen and learn science as it changes
- Must take responsibility for the question: what must I do for the suffering of others?

- **Four ethical questions raised by a AAAS committee in its September 2000 report give an example of how we look at the issue:**
 - 1. Are there reasons in principle why performing the act should be impermissible?**
 - 2. What contextual factors should be taken into account and do any of these prevent development and use of the science ?**
 - 3. What purposes, techniques or applications would be permissible and under what circumstances?**
 - 4. What procedures, structures, involving what policies, should be used to decide on appropriate techniques and uses?**

Quick review slide

Central dogma: Making Good

- Not violating actual rules
- Actually trying to do good (Beneficence)
- Avoid deliberate harm (Non-Maleficence)
- Not lying (really never ever lying)
- Publishing with integrity and collaboration
- Not abusing graduate students
- Not exaggerating results or hyping ideas (NO DECAPHILIA)
- Not using research subjects against their will, or with deceit, or without proper consent (Autonomy)
- Pay attention to vulnerable populations (Justice)
- Avoid religious or political claims of authority (no revolutions and no redemptions)

And remember

“Science is a magnificent achievement of the human mind and the manner in which scientists order the facts of the natural world is often full of subtlety and beauty. As a cultural activity, science can be a great source of hope for humankind. It is not enough, however, to be in awe of science. It is critical to understand both its promises and its limitations.”

Harold Schapiro, Ph.D.

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