EMBRYONIC STEM CELLS: BIOETHICS

**ETHICS**
- The study of right vs. wrong, good vs. bad, moral judgment, etc.

**BIOETHICS**
- Ethical questions that arise in the relationships among life sciences, biotechnology, medicine, politics, law, philosophy, and theology.

**EUGENICS (obvious) - Genetic racism**
Humans should practice selective reproduction to improve the species. Rationale for genocide:
- Remove the unfit from the gene pool

**GENE THERAPY** (less obvious ethical problem)
- Devastating genetic defect at birth.
- No effective alternative treatments.
- Replace or repair targeted genes. What is the problem here?

**EMBRYONIC STEM CELLS**

**ETHICAL QUESTIONS: POTENTIAL BENEFITS AND HAZARDS**

**In Favor of Gene Therapy**
- Separately in patients.
- The only hope.
- Other treatments failures.
- Obligation to treat patients if we can.
- Scientific community right to free inquiry within bounds of acceptable research.

**Against Gene Therapy**
- Are there "good" and "bad" uses of gene modification?
- Potential for harmful abuse of technology in future?
- Possible unknown long-term effects - future generations.

**Patients’ Rights**
- Are candidates children too young to understand ramifications of treatment.
- Should those who could use miniaturization be treated?
- Expensive therapy strain on health care system.
-thag's privacy/confidentiality interests as interests of health insurance companies.

**GENE THERAPY**

**Other possibilities (unlikely)**
- Normal gene swapped for a normal gene via homologous recombination.
- "Sliced-off" gene could be replaced by reverse methylation.
- The regulation turning on or off of particular gene could be altered.

**GENE THERAPY USING AN ADENOVIRAL VECTOR**

**EUGENICS**
- Social philosophy of improvement of human hereditary traits through various forms of intervention.

**Methods**
- Historical: selective breeding, sterilization, rape, genocide.
- Modern: prenatal testing/screening, genetic counseling, birth control, IVF, genetic engineering.

**GOALS**
1. Creation of healthier, more intelligent people.
2. Save society’s resources, and lessen human suffering.
3. Racially based goals or desires to breed for qualities, like fighting abilities.
Consensus: division of human species into unequal races is unjustifiable.

Inspired: breeding animals (purebreds) analogy for improving human society.

Early Eugenicists: intelligence correlated with social class; breeding to improve society.

Alexander Graham Bell (1881): no marriage for deaf (deaf partner)
Virginia law (US Supreme Court, 1927): hereditary mental patients

Alberta Canada Eugenics Board (1928): sterilize “monot” status individuals.

Nazi Germany (1933): Holocaust, sterilization, Aryan woman forced pregnancy, adopt “socially valuable” children.


In Vitro Fertilization Procedure

Hormone Stimulation
- Gonadotropins (Fsh, Lh) administered

Embryo Collection
- Sperm injection (Iui), follicular aspiration (1-2 per cycle)

Fertilization
- In vitro or in vivo

Hormone Treatment
- Supplemental progesterone (h1)

Pregnancy Test
- Beta hCG (4wk)

Leftover embryos frozen in liquid nitrogen.

IVF Clinic Preferences
- Collect 15 eggs after PFIH treatment
- Implant 2 high-grade embryos

One blastocyst embryo transferred on day 5 (grade 4)
Nick arrived 9 months later