

**Yes...No...Maybe?**  
**Introduction to Bioethics**

**Biotechnology**

- The application of scientific and engineering principles to biological agents to provide goods and services to better human life
- Many moral issues today are centered around genetic engineering via the manipulation of DNA

**Ethics**

- Moral philosophy
- Discipline concerned with what is morally good and bad, right and wrong

**Bioethics**

- Discipline dealing with the ethical implications of biological research and the applications of that research
- Deals with the questions relating to the appropriate use of new technologies

**There are no simple answers to ethical dilemmas...**

- What will cause the greatest good for mankind?

**Eugenics**

- An effort to breed better human beings
  - Encourage “good genes”
  - Discourage “bad genes”
- Fear of history
  - Sterilization of the mentally ill in early America
  - Nazi concentration camps

**Reproductive Cloning**

- Creating a genetically identical organism
- Many animals have been successfully cloned

**Human Cloning**

- *Clonaid* claims that they have the ability to clone humans

**Therapeutic Cloning**

- Cloning Individual Human Cells
  - Involves Stem cells
    - precursor cells that give rise to specialized cells/multiple tissue types
  - Allows for the generation of human tissue and organs
  - Enhances our understanding of human development and serious medical conditions (cancer, birth defects, etc)

- Embryonic vs Adult Stem Cells

### **Pre-Implantation Genetic Diagnosis (PGD)**

- Diagnosing inherited genetic disorders “in vitro”
  - Choosing which embryos will be transferred to the uterus based upon desired traits
  - Gender decisions
- “Designer Babies?”

### **Genetic Testing**

- Individual risk assessment based upon a person’s DNA profile
  - DNA chip identifies genetic predispositions
  - Potential for genetic discrimination
  - DNA profiling?
  - DNA banks?

### **Transgenic Plants**

- Engineered plants that contain novel genes from other species
  - Results in new characteristics that make plants more desirable and useful to humans
- Are they safe to eat?
- How do they affect the ecosystem?

### **Transgenic Animals**

- Engineered animals that contain novel genes from other species
  - Results in animals that are more desirable and useful to humans
- Are they safe to eat?
- Where do we draw the line?

### **Xenotransplantation**

- Harvesting organs from animals for organ transplantation into humans
  - Severe organ donor shortage
    - Pigs
      - Perfect match!
- Do we have the right? PETA
- Dangers of creating new human viruses

### **Finding a Balance**

- Focusing on whether or not “we could”
  - Instead of whether or not “we should”
  - Weighing the Pros versus the Cons
- Acknowledging the tremendous responsibilities that must be faced with the information that we have acquired.