

# Help or Hype: Exploring the Ethics of Bio-nanotechnology

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The logo for the National Nanotechnology Initiative (NNIN) features the letters "NNIN" in a bold, blue, sans-serif font. The letters are slightly shadowed and appear to be floating above a light gray diamond shape that has a grid pattern.

[www.nnin.org](http://www.nnin.org)  
Nanoscale Science,  
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# Why Study Ethics?

- All parts of science must consider ethics
- Ethics simply asks the question “Just because we can, should we?”



# Genetically Modified Foods

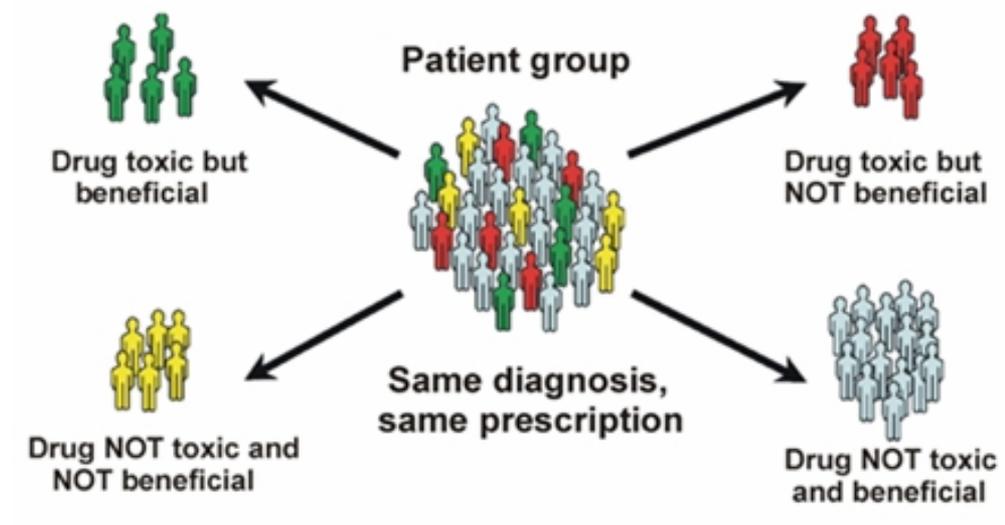
- A genetically modified organism (GMO) is an organism that has foreign DNA inserted into its genome using genetic engineering
- Genetically modified plants were first introduced in US in 1996
- **Are there any ethical concerns with producing and consuming a GMO?**



Picture courtesy of Monsanto Corp. (used with permission)

# Personalized Medicine

- Medicine that is prescribed based on your genetic information.
- Eliminates the one-size fits all view of medicine.
- **What are some ethical concerns of personalized medicine?**



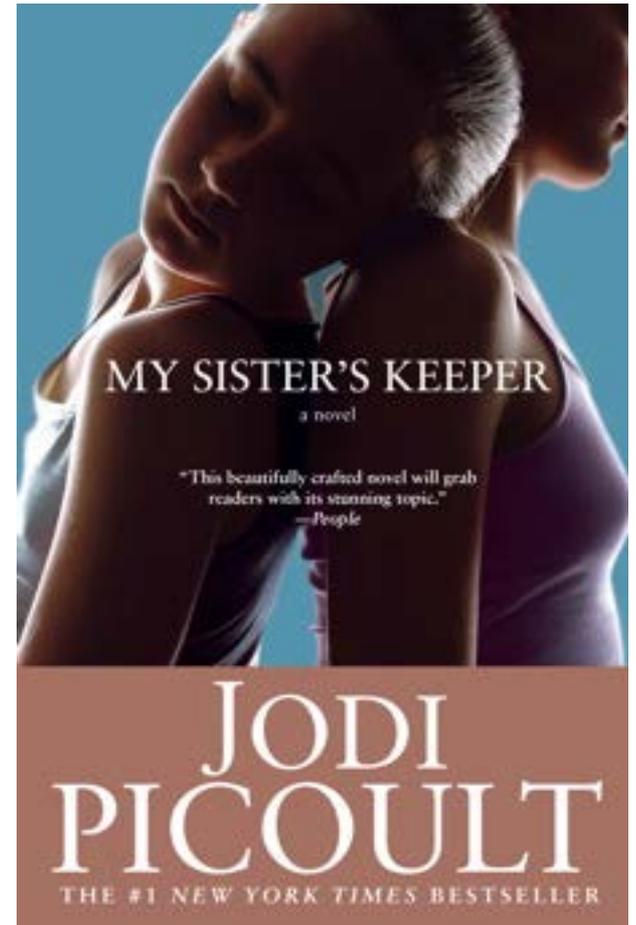
Picture courtesy of University of Michigan



Picture courtesy of BioPolitical Times

# Genetic Selectivity

- Parents can screen embryos to determine the genetic properties of their future children. Uses of the technology includes
  - Curing or treating existing genetic defects in children
  - Obtaining children that have specific desired characteristics
- **Is it ok to select a child based on desired genetic traits?**



[Picture courtesy of Simon and Schuster](#)

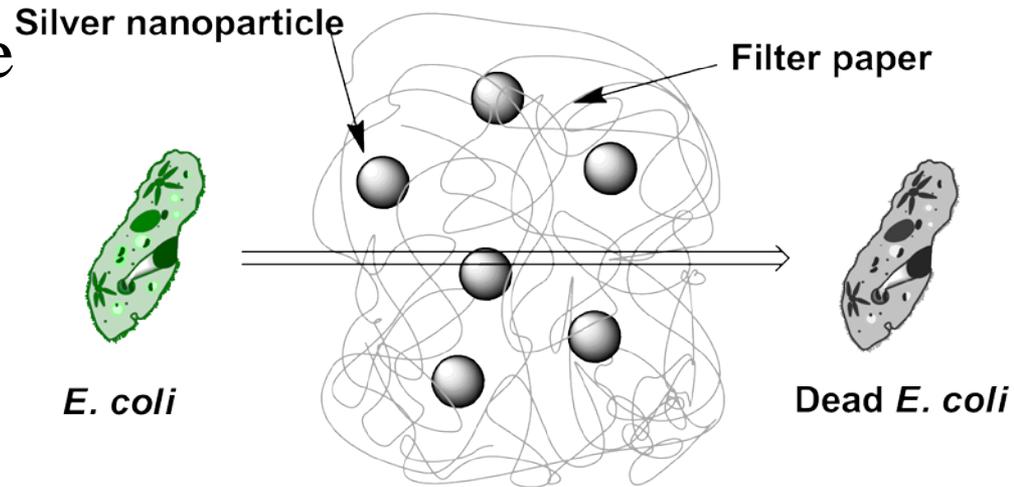
# Public Awareness

- Some people do know the impact of many of the additives and chemicals that they come in contact with each day.
- **What are some ethical concerns with food labeling?**
- **Are labels necessary and effective?**



# Nanotechnology

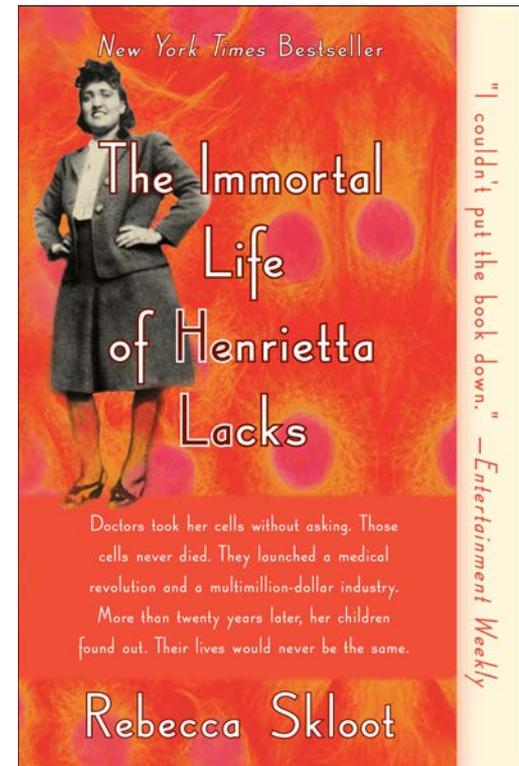
- Field that studies objects 1-100 nm in size (in one direction).
- Silver nanoparticles are naturally antimicrobial and are incorporated into many consumer products.
- **What are some ethical concerns with using silver nanoparticles?**



Picture courtesy of Environmental Health News

# Are the those my tissues?

- After a surgical procedure or biopsy do you own the removed tissue?
- **What are some ethical concerns with the use of collected tissues?**



Courtesy of the Lacks Family and Rebecca Skloot.



# Wrap Up

- Research a scientific topic and record three ethical concerns related to it.
- Create a poster or a Powerpoint on your research.