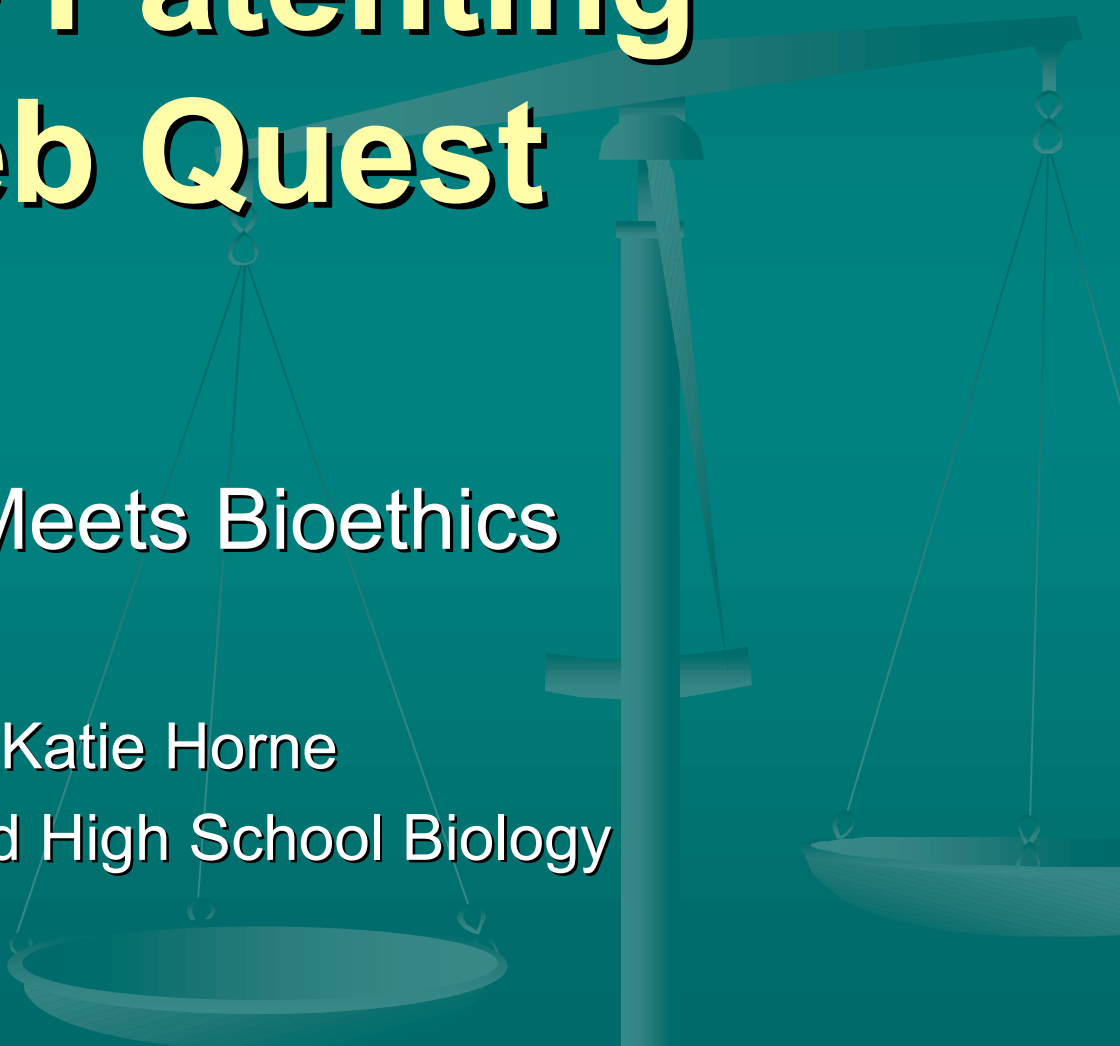



Gene Patenting Web Quest



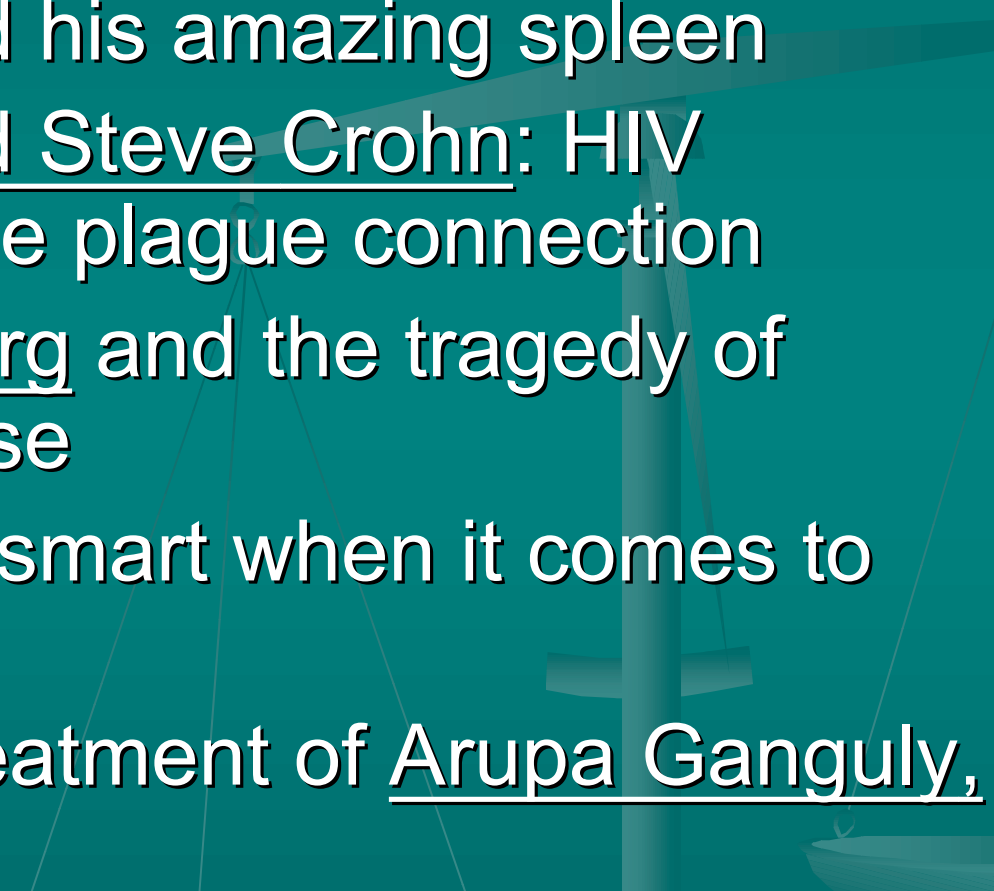
Law Meets Bioethics

Katie Horne
Marshfield High School Biology

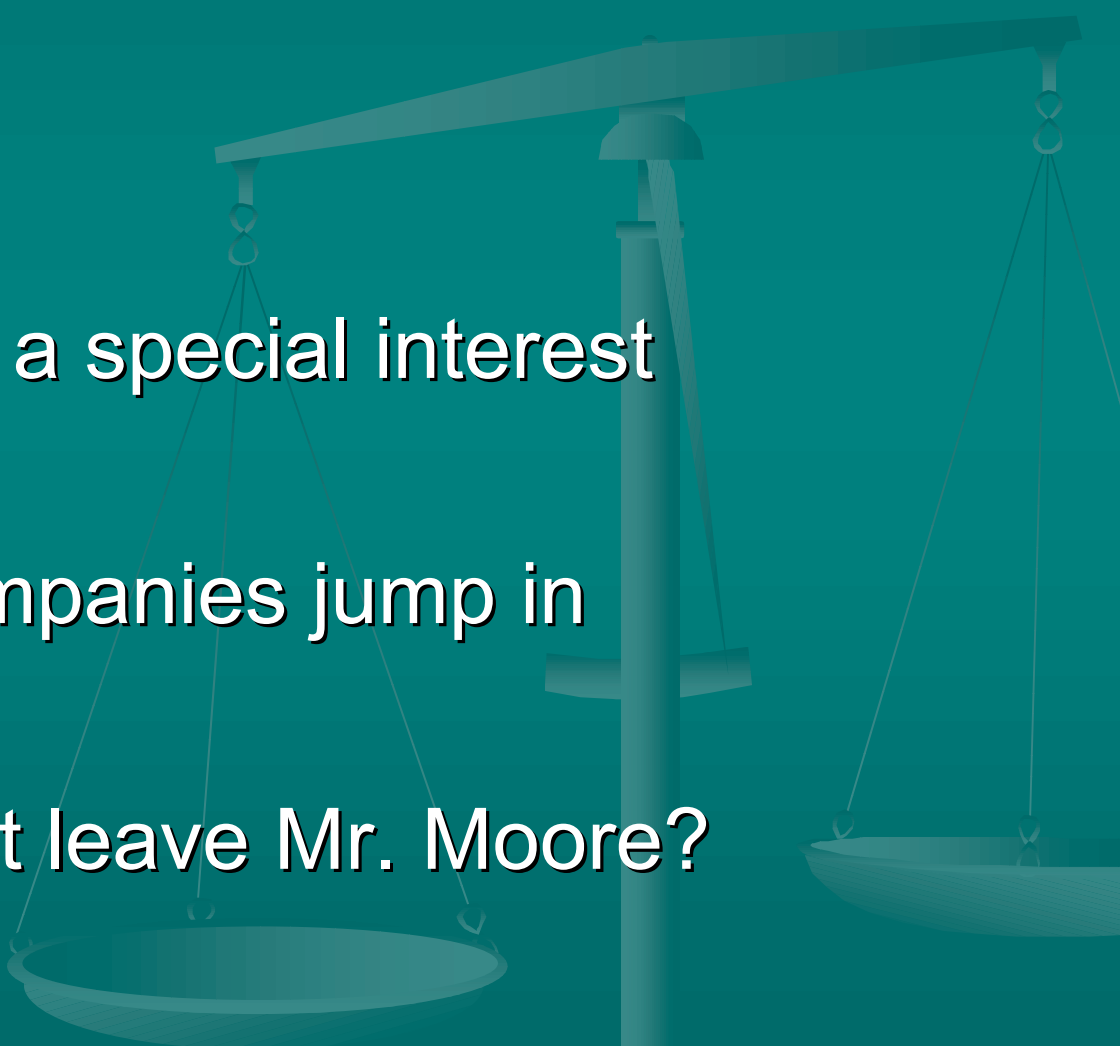
Gene Patents and Immunology??

- Aspects of immunology embedded in another topic.
 - Gene Patenting is a new development.
 - Student enthusiasm.
- 

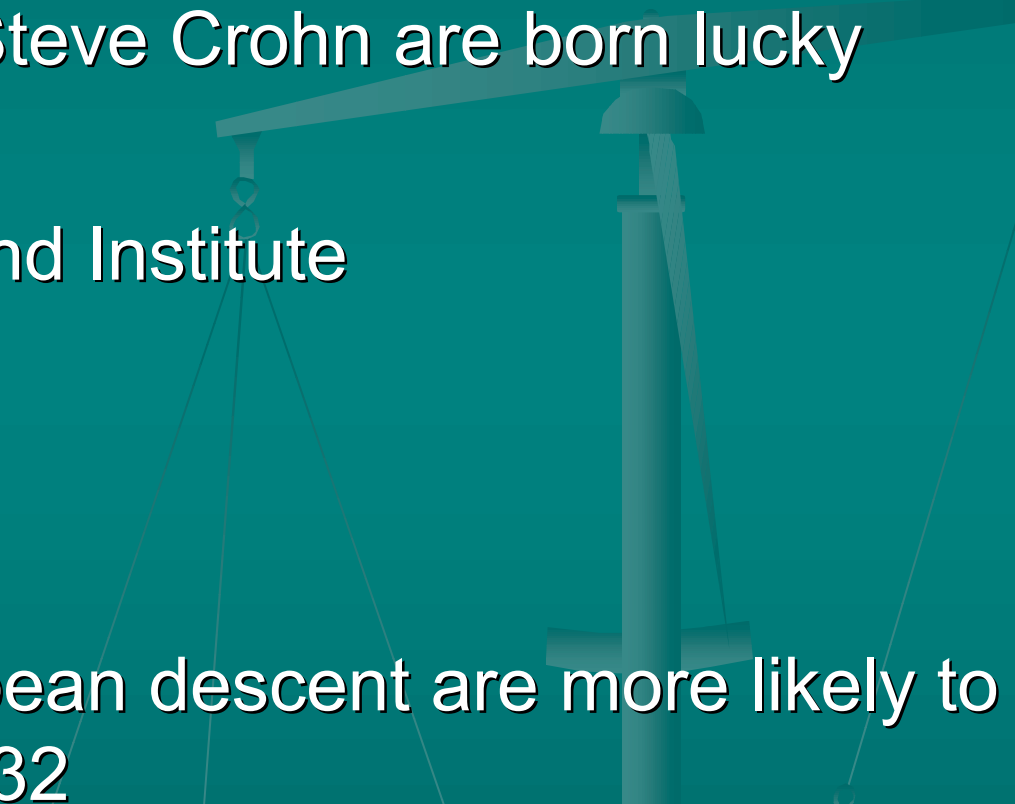
The Cases

- John Moore and his amazing spleen
 - Erich Fuchs and Steve Crohn: HIV immunity and the plague connection
 - Daniel Greenberg and the tragedy of Canavan Disease
 - The Terry's get smart when it comes to patent law
 - The (unfair?) treatment of Arupa Ganguly, PhD.
- 

John Moore and His Amazing Spleen

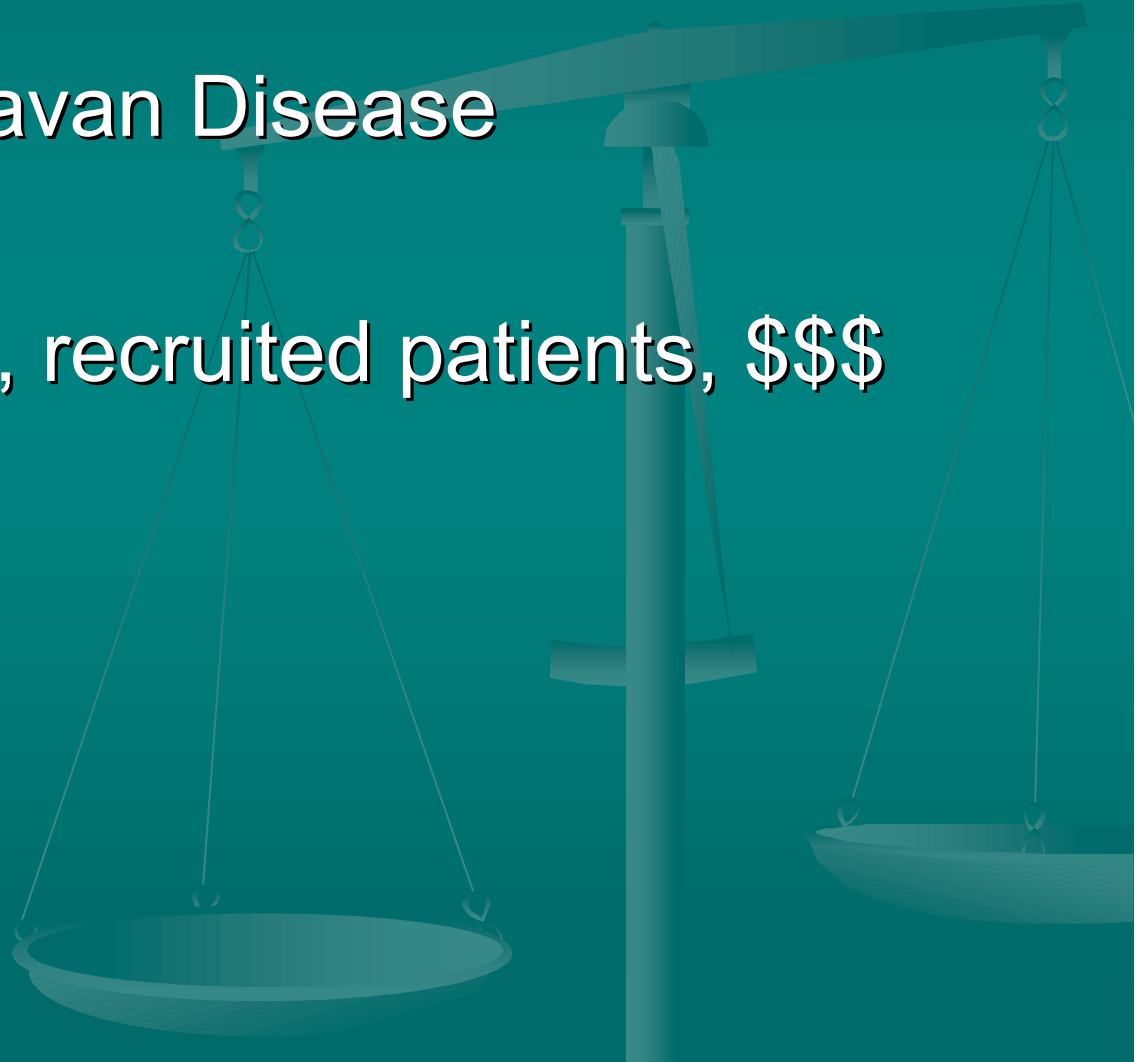
- The diagnosis
 - Dr. Golde takes a special interest
 - The Biotech companies jump in
 - Where does that leave Mr. Moore?
- 

HIV “Immunity”

- Erich Fuchs and Steve Crohn are born lucky
 - The Aaron Diamond Institute
 - CCR5 delta 32
 - People with European descent are more likely to have CCR5 delta 32
- 

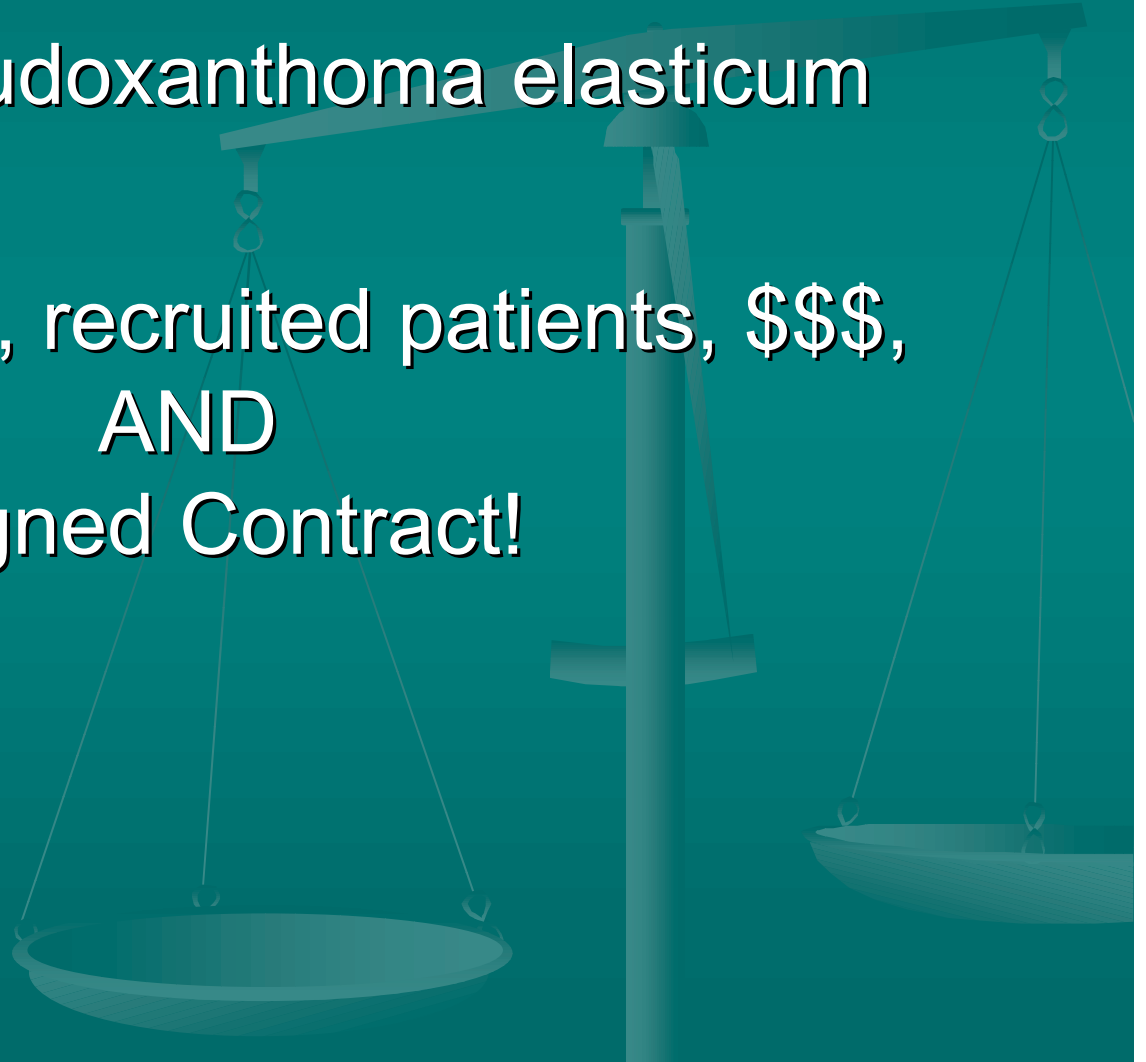
The Tragedy of the Greenbergs

- Diagnosis: Canavan Disease
- Tissue samples, recruited patients, \$\$\$



The Foresight of the Terry's

- Diagnosis: Pseudoxanthoma elasticum
- Tissue samples, recruited patients, \$\$\$,
AND
A Signed Contract!



Arupa Ganguly, PhD.

- BRCA 1 and 2 Testing

- Myriad Genetics

- Winners: Myriad
public?

Losers: The



The Law

- The role of patents in research
- Rules of the genetic game
- 20 year monopoly



PRO:

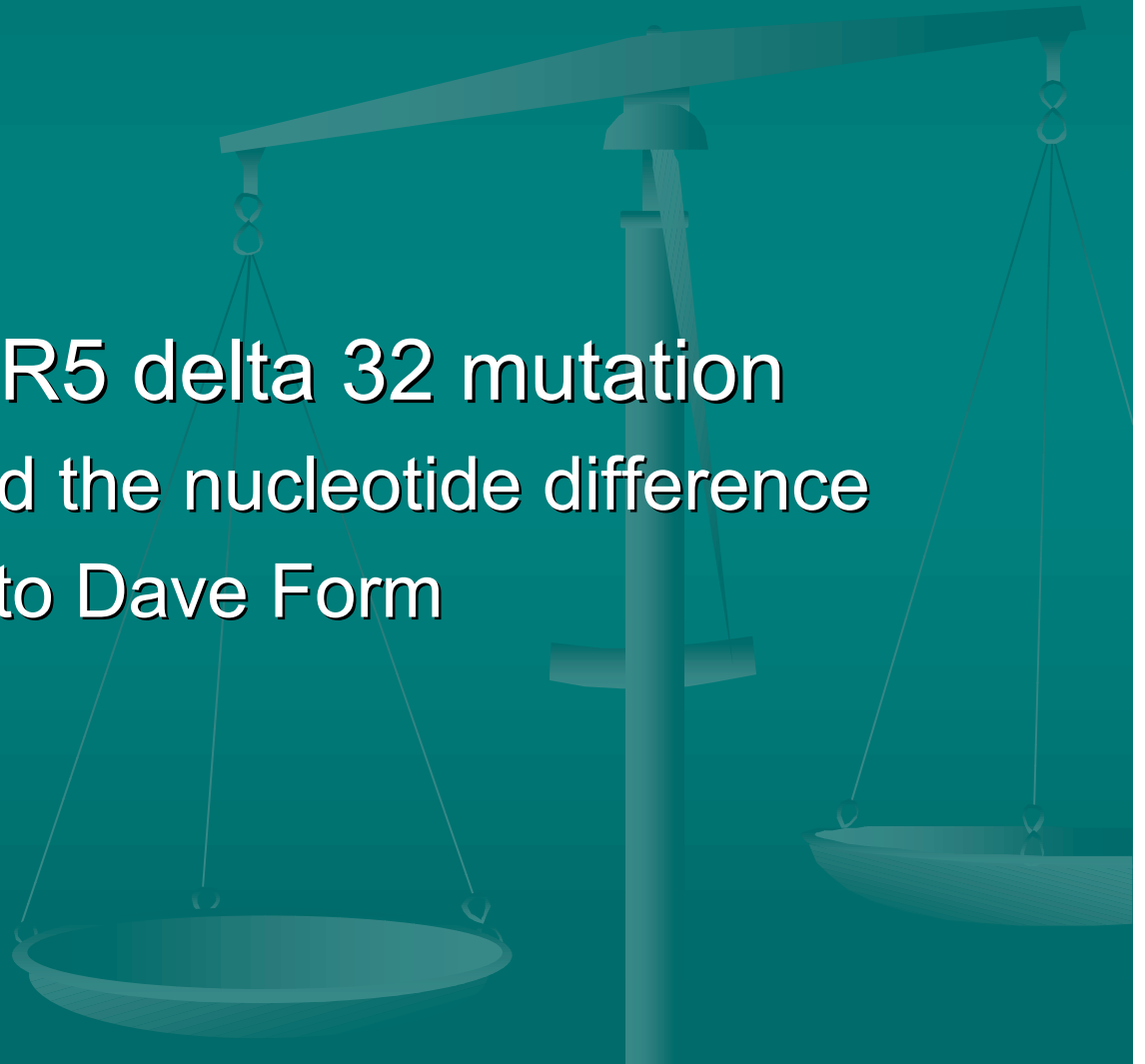
- *Researchers are rewarded for their discoveries and can use monies gained from patenting to further their research.*
- *The investment of resources is encouraged by providing a monopoly to the inventor and prohibiting competitors from making, using, or selling the invention without a license.*
- *Wasteful duplication of effort is prevented.*
- *Research is forced into new, unexplored areas.*
- *Secrecy is reduced and all researchers are ensured access to the new invention*

CON:

- *Patents of partial and uncharacterized cDNA sequences will reward those who make routine discoveries but penalize those who determine biological function or application (inappropriate reward given to the easiest step in the process).*
- *Patents could impede the development of diagnostics and therapeutics by third parties because of the costs associated with using patented research data.*
- *Patent stacking (allowing a single genomic sequence to be patented in several ways such as an EST, a gene, and a SNP) may discourage product development because of high royalty costs owed to all patent owners of that sequence; these are costs that will likely be passed on to the consumer.*
- *Because patent applications remain secret until granted, companies may work on developing a product only to find that new patents have been granted along the way, with unexpected licensing costs and possible infringement penalties.*
- *Costs increase not only for paying for patent licensing but also for determining what patents apply and who has rights to downstream products. Patent holders are being allowed to patent a part of nature --a basic constituent of life; this allows one organism to own all or part of another organism. Private biotechs who own certain patents can monopolize certain gene test markets.*
- *Patent filings are replacing journal articles as places for public disclosure --reducing the body of knowledge in the literature.*

Bioinformatics

- The ABC's
- HIV and the CCR5 delta 32 mutation
 - Using NCBI, find the nucleotide difference
 - Special thanks to Dave Form



The Actual Patents

- <http://dnapatents.georgetown.edu/ostext/5679635.htm>
- <http://dnapatents.georgetown.edu/ostext/5753441.htm>



Additional Resources

- Do Your Cells Belong to You?
- To Own or Not to Own DNA

