Why Bioethics?

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BioS 10/ BioS 90: Bioscience in the 21st Century

Weds 8/29/2018
Why Bioethics?

What is Bioethics?
We can ask scientific AND ethical questions about biology.

What do these questions look like?
Scientific and ethical questions about biology.

Example: Addiction Neurobiology

• What are some scientific questions?
• What are some ethical ones?
• How do these scientific and ethical questions relate to each other?
Ethics: What “ought” to be?

Many different types of questions:

**Research ethics:** How is scientific knowledge created? Who creates it? What methods are used to obtain that knowledge?

**Use of scientific knowledge:** Technology resulting from scientific knowledge? Development of medical treatments / drugs? Scientific basis for policy? Who benefits from science?
The Social Life of DNA: Race, Genetics, and Genealogy | Interdisciplinary Programs

◊ Tuesday, September 11 at 4:10pm
📍 Williams Hall, Roemmele Global Commons
31 Williams Dr, Bethlehem, PA 18015

Professor Alondra Nelson, Columbia University will give a lecture on The Social Life of DNA Race, Genetics and Genealogy in which Nelson unravels the double helix of genetics and racial justice. Ancestry tracing by black Americans is very popular, using sites like africanancestry.com and 23andme. Has it helped civil rights? Social justice? Legal claims? Yes and no. Reception and book signing following.

https://eventscalendar.lehigh.edu/event/alondra_nelson_lecture#.W4ZTvn4na8U
Neuroethics

How “ought” we to consider, research, and treat brains in health and illness?

How should we study??

Who should do the studying of??

Whose should we study??

How should we use the knowledge that we gain from brain research?
Neuroethics: some of the issues

Wearable technology
- e.g. fitbits, health apps on smartphones

Mental health and illness
- Definitions of “disorder” (e.g. addiction, anxiety, autism, schizophrenia)
- Experimental and invasive treatments (e.g. deep-brain stimulation for Parkinson’s disease, OCD, depression).

Socioeconomic variables and the brain:
- Effects of childhood adversity on the brain
- Access to health care

Cognitive enhancer drugs?
- Should people be allowed to use these?
- In what situations?

Why do we care so much about these issues?

Head Transplants????
Ethics and Biology: asking bigger questions

Ethical questions in biology allow us to understand relationships between people and the natural world in more complex ways.

Thank you!
BIOMEDICAL ETHICS:

Medication Access
The price is right?
Hepatitis C

- An infection caused by a virus that attacks the liver and leads to inflammation. Most people infected with the hepatitis C virus (HCV) have no symptoms.

- In 20% of cases, liver cancer develops and is fatal

- 71,000,000 people chronically infected

- October, 2014: FDA approves Harvoni, once-daily oral nucleotide analog polymerase inhibitor

- There are multiple forms
Gilead Sciences: Harvoni

- Sales: $14 billion in 2015
  $4.4 billion in 2017

- Cost of Treatment: $94,500/patient in 2014
  $48,000/patient in 2017

Ethical Issues

- Who pays?
- Is the price justified?
- Relative cost?
Hepcinat LP cost about $900 in India vs $94,500 for Harvoni in the US.
DRUGS FOR NEGLECTED DISEASES INITIATIVE (DNDi): A NEW APPROACH

- **Non-profit organization**

- **Collaborates with governments and philanthropies**
  
  - **ASAQ** and **ASMQ**, an antimalarial fixed-dose combination that has reached over 500 million patients. Now with Medicines for Malaria.
  
  - **NECT**, the first improved combination treatment for sleeping sickness in over 25 years. 100% of stage 2 HAT patients treated in all 13 endemic African countries
  
  - **paediatric benznidazole**, the world’s first child-friendly medication for Chagas disease. dispersible tablet for children under 2 years of age. Primarily in South America
  
  - **SSG&PM** in East Africa for treatment of visceral leishmaniasis. Primarily in Asia, East Africa, South America.
DNDi Case Study: Hepatitis C

- 72% of patients live in low- and middle-income countries

- **Need**: direct antiviral that is effective against all genotypes that is efficacious, well-tolerated with a short treatment duration, and simple to use

- *sofosbuvir/ravidasvir* was effective in 97% of patients in a Phase 2/3 trial (April, 2018)

- Cost will be $300

How DNDi DO THIS?

- Partnership with Malaysia and Thailand
- Manufacture in Egypt
# Most Expensive Drugs: United States

<table>
<thead>
<tr>
<th>Drug Name</th>
<th>Annual Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Actimmune (Chronic Granulomatous Disease;</td>
<td>$627,852</td>
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<tr>
<td>slows severe, malignant osteopetrosis)*</td>
<td></td>
</tr>
<tr>
<td>H.P. Acthar Gel (Multiple Sclerosis)</td>
<td>$205,681</td>
</tr>
<tr>
<td>Cinryze (Hereditary Angioedema)*</td>
<td>$230,826</td>
</tr>
<tr>
<td>Kalydeco (Cystic Fibrosis)</td>
<td>$299,592</td>
</tr>
<tr>
<td>Naglazyme (Maroteaux-Lamy Syndrome)*</td>
<td>$485,747</td>
</tr>
<tr>
<td>Soliris (paroxysmal nocturnal hemoglobinuria) *</td>
<td>$536,629</td>
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*orphan indication