THE HISTORY OF RESEARCH PROTECTIONS

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THE UNIVERSITY OF VERMONT’S OVERSIGHT COMMITTEE’S

- Institutional Review Boards (IRB)
  - Human Subjects Protections (medical and behavioral)

- Institutional Animal Care and Use Committee (IACUC)
  - Vertebrate Animal Research

- Institutional Biosafety Committee (IBC)
  - Ensuring the safety of researchers working with infectious agents
University of Vermont and The UVM Medical Center are involved in pioneering behavioral and biomedical research and are committed to assuring all research activities are conducted in a manner promoting the rights and welfare of the participants.
WHY IS RESEARCH SO HEAVILY REGULATED?

Nazi War Crimes – Nuremberg Trials (1945-1946)

20 German physicians and 3 Nazi officials were charged with crimes against humanity for conducting research procedures on concentration camp prisoners without consent.
Experiments resulted in death, trauma, disfigurement or permanent disability, and are considered examples of medical torture.

- Development of new weapons
- Aid in the recovery of military personnel
- "cure" homosexuality
- Twin experiments
- Freezing
- Sterilization
- Bomb experiments
- High altitude
- Malaria

*results of the trial horrified the world and led to the creation of the Nuremberg Code. Research ethics for human expiration in medicine.
The experiment began with 600 black men, mostly poor and uneducated, from Tuskegee, Ala., an area that had the highest syphilis rate in the nation at the time.

- 399 of the group had syphilis and never received deliberate treatment for the venereal infection.

- A control group of 201 had no syphilis and did not receive any specific therapy.

- As incentives to enter the “program”, the men were promised free transportation to and from hospitals, free hot lunches, free medicine for any disease other than syphilis and free burial after autopsies were performed.
WHAT WENT WRONG?

▪ The Tuskegee Study began 10 years before penicillin was found to be a cure for syphilis and 15 years before the drug became widely available.

▪ The men were never given adequate treatment for their disease.

▪ Even when penicillin became the drug of choice for syphilis in 1945, researchers did not offer it to the subjects.
- Syphilis left untreated can cause bone and dental deformations, deafness, blindness, heart disease and deterioration of the central nervous system.
- By 1969 seven participates had died as a direct result of untreated syphilis.
- There was no evidence that researchers had informed them of the study or its real purpose.
- The men had been misled and had not been given all the facts required to provide informed consent.
PREVENTING A REPEAT OF MISTAKES

▪ In 1974, the National Research Act was signed into law, creating the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research. The group identified basic principles of research conduct and suggested ways to ensure those principles were followed.

▪ Researchers must get voluntary consent

▪ Studies must be reviewed by Institutional Review Boards (That’s us!) which read study protocols and decide whether they meet ethical standards.

Official apology by President Clinton in 1997
HENRIETTA LACKS

THE IMMORTAL LIFE OF HENRIETTA LACKS

Doctors took her cells without asking. Those cells never died. They launched a medical revolution and a multimillion-dollar industry. More than twenty years later, her children found out. Their lives would never be the same.

REBECCA SKLOOT
1951- Henrietta went to Johns Hopkins for treatment of her aggressive adenocarcinoma of the cervix (dies later in 1951)

- Tissue sample taken without consent – given to Dr. George Gey
- First human cell line developed – HeLa cell line
- Used by researchers around the world
  - Studies with zero gravity in outer space, aided in the development of the polio vaccine, leukemia and AIDS
- Genome sequenced in 2013
WHAT WENT WRONG

▪ Tissue was taken without her consent
▪ The cells were not *de-identified*
▪ Millions of dollars made for companies but the family has received little to none
VERTEBRATE ANIMAL RESEARCH

- The Institutional Animal Care and Use Committee is UVM's central review body for matters relating to the humane care, use and treatment of animals related to research, testing and teaching.
“THE LOST PETS THAT STRAY TO THE LABS”
SPORTS ILLUSTRATED 1965

- Pepper the Dalmatian
- June 22, 1965 didn’t come back to the PA farm
- Pepper appeared with a known dognapper named Jack who sold animals to hospitals for research.
- Eventually Pepper’s body was found Montefiore Hospital in New York City.
- Medical researchers had tried to implant her with an experimental cardiac pacemaker, but the procedure went awry, and she died.
- Pet dogs were being “dog napped” and sold for animal experiments
- Animals were chained to wooden boxes and left out in the cold to feed on frozen entrails.

“Concentration camp for dogs”
Life magazine 1966
1966 LABORATORY ANIMAL WELFARE ACT (LAFA)

- Public outcry was so great it led to the 1966 Laboratory Animal Welfare Act.
- This act licenses dealers, exhibitors and breeders of animals, regulates research facilities that use animals, lists standards for the humane care and treatment of animals and regulates the transportation of animals.

- Developed 8 areas of minimum standards
  1. Housing
  2. Feeding
  3. Watering
  4. Sanitation
  5. Shelter
  6. Separation of Species
  7. Ventilation
  8. Adequate Vet Care
1970 ANIMAL WELFARE ACT

- LAWA changed to AWA
- Extension into the laboratory
- Report number of animals by pain categories
- Require appropriate use of anesthetics
- Included standards for animal transport
- Include all warm blooded except those excluded by the Sec of Ag

1985 ANIMAL WELFARE ACT

- Establishment of IACUC (That’s us!)
- Assign responsibility to Institutional Official
- Review of protocols
- Semiannual program review & inspection
- Search for alternatives to painful procedures
- Personnel qualifications
- Environmental enrichment for NHPs
- Exercise for dogs
AWA is now applied to every dog, cat, monkey, rabbit, hamster, and guinea pig in federally funded labs.

The AWA specifically exempts birds, mice and rats used in research as well as agricultural animals that are used for agricultural production. The Act also exempts horses that are not used for research purposes.

The United States Department of Agriculture (USDA) is the government agency that is responsible for the enforcement of this act.

If noncompliance is found this could result in a loss of funding to the institution.
BIOSAFETY OVERSIGHT

The University of Vermont (UVM) is committed to minimizing the risks to faculty, staff, students, the public, the facilities, and the environment while using biohazardous materials during research at UVM.

The Institutional Biosafety Committee (IBC) is responsible for ensuring that the use of biohazardous materials in research is done safely.
What is a Biohazard?

An agent of biological origin that has the capacity to produce harmful effects on humans; i.e. microorganisms, toxins and allergens derived from those organisms, and allergens and toxins derived from plants or animals.
WHAT BIOHAZARDOUS MATERIALS DOES THE IBC REVIEW?

Recombinant DNA – molecules constructed outside of living cells by joining natural or synthetic DNA segments to DNA molecules that can replicate in a living cell, or molecules that result from their replication.
WHAT BIOHAZARDOUS MATERIALS DOES THE IBC REVIEW?

Select Agents - Pathogens and toxins considered to have the potential to pose a severe threat to human, animal, or plant health and safety.

- Ebola virus
- Ricin
- 1918 pandemic influenza virus

*UVM currently does not have any IBC protocols or labs working with Select Agents
WHAT BIOHAZARDOUS MATERIALS DOES THE IBC REVIEW?

**Infectious Biological Agents** – present a risk or potential risk to the health of humans or animals, either directly through infection or indirectly through damage to the environment.

- Human, animal, and plant pathogens (bacteria, parasites, fungi, viruses, prions).
- All human blood, blood products, tissues, and certain body fluids when used in conjunction with infectious agents or recombinant or synthetic nucleic acid molecules.
- Cultured cells and potentially infectious agents these cells may contain.
- Clinical specimens.
- Infected animal and animal tissues.
WHAT BIOHAZARDOUS MATERIALS DOES THE IBC REVIEW?

**Biotoxins** - a poisonous substance that is a specific product of the metabolic activities of a living organism and is usually very unstable, notably toxic when introduced into the tissues, and typically capable of inducing antibody formation.

- Behave like a chemical toxin (not infectious)
- Can be produced by bacterial or fungal fermentation or rDNA
  - anthrax, botulism, small pox

TB Virus
THE RESEARCH PROTECTIONS OFFICE SUPPORTS THE INSTITUTION’S CONDUCT OF SAFE AND ETHICALLY SOUND SCIENTIFIC RESEARCH INVOLVING HUMAN PARTICIPANTS, VERTEBRATE ANIMALS AND BIOHAZARDS.