

Chemistry 3250
Ethics case study 1:
Dual-use research

Due: Tuesday, Feb. 14, 12:15 p.m.

Dual-use research

Dual-use research is research that could be used for good or bad.

- Whether explicitly thought of that way or not, a great deal of scientific research is dual-use.
- Dual-use research raises not only direct ethical issues, but also requires risk assessments.
- Some questions that arise in dual-use research:
 - How likely are the potential good and bad uses?
 - Are there compelling reasons to do the research that outweigh the risks?
 - Would people who might put the research to a bad use be likely to come up with the idea themselves?

Person-to-person transmissibility of H5N1

- H5N1 is an avian influenza subtype.
- One strain of H5N1 caused a great deal of concern a few years ago because it caused a high rate of mortality among humans who caught it from birds.
- H5N1 is not directly transmissible from person to person.

Some reasonable questions

- Why isn't H5N1 transmissible from person to person?
- Could it become directly transmissible?
- How likely is that to happen?

- What genetic changes in the virus should global influenza networks look for as early warning of transmissibility between people?
- There are existing H5N1 vaccines, as well as antiviral drugs that can be used to treat people with this disease.

Would the vaccines be effective against a mutated virus capable of person-to-person transmission?

Would the available antiviral drugs be effective in treating a person infected with the mutated virus?

(Note that these questions would be answered using animal models, not human experimentation!)

Some concerns

Recall that H5N1 is very deadly to humans. A variant of this virus that was directly transmissible from human to human could cause massive mortality.

- The virus could be accidentally released from the lab.
- The virus (or an animal carrying it) could be stolen from the lab.
- If it turns out to be easy to create a directly transmissible strain of H5N1, the experiment could be replicated elsewhere.

The dilemma

- You are a researcher working for a major health organization and you have the skills and knowledge to tackle the scientific questions raised above.
- H5 flu viruses have not been believed to be capable of causing serious human pandemics. If this belief is wrong, then we could be taken by surprise by an H5N1 pandemic, making the pandemic worse.
- Of course, you worry about the possibility of the virus getting out of your lab (not likely, but possible), and more so about the possibility of the wrong people getting their hands on a directly transmissible version of H5N1, whether directly from your lab, or using the knowledge created in your lab.
- *Do you go ahead with the research?*