**2 May, 2012**

# Avian flu and scientific censorship: When should scientists keep their mouths shut?

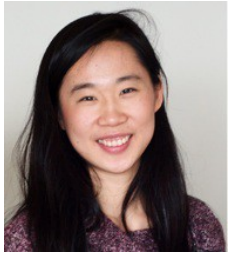
**Introduction:**

When a team of scientists discovered in 2011 how to make the deadly H5N1 "Avian flu" virus transmissible through air, it stirred a debate about scientific ethics and national security that has raged for months everywhere from the top levels of the National Institutes of Health to the front page of the New York Times. In tonight's lecture we address the questions swirling around this controversy: What was so dangerous about this discovery that led the US government to ask that a prestigious scientific journal censor the scientists' reports, why are scientists pursuing such controversial research in the first place, and what role should the government take in controlling the dissemination of scientific advancements?

**Speakers:**

**Ann Fiegen** is a second year student in Harvard's Virology PhD program, studying how the viral genome – often RNA molecules – are detected by cellular proteins to trigger the immune response. She grew up in St. Paul, Minnesota and attended college in Cincinnati, OH at Xavier University. Outside the lab, she plays ultimate frisbee and play trumpet in the Harvard jazz band. Today, Ann will decode the basics of the influenza virus and H5N1 in particular.

**Kevin Bonham** is a fourth year student in Harvard's Immunology PhD program and studies the interface between microbes and the mammalian immune system. Specifically, he studies a class of receptors on the surface of immune cells that are able to detect the presence of bacteria, viruses and fungi. When not doing science, he is typically climbing rocks, hiking trails, or blogging about science at scienceblogs.com/webeasties. Today, Kevin will discuss the risks and benefits of dual-use research.



**Tina Liu** is a 4th year PhD student in the BBS (Biological & Biomedical Sciences program) and is doing her thesis research in the lab of Tom Rapoport. Generally speaking, she studies how the cell came to be the way it is; specifically, she looks at why and how organelles, the internal "organs" of a cell, adopt specific shapes. Tina did her undergraduate studies at Yale, and lived in Wisconsin and Canada before then. She enjoys art, piano, ice skating, cooking, and being outdoors. Today, Tina wil discuss how this scientific censorship controversy compares to others in the past.

## Glossary

**Avian flu / A(H5N1):** A naturally-occuring species of flu virus common in some bird populations and transmissible to humans through direct contact. The natural form of the virus can be deadly, but is very rarely transmitted between humans.

**Biosafety levels:** A system of containment procedures used in research facilities to isolate biological agents. The lower level, BSL-1, is is used when dealing with agents not known to cause diseases in healthy adults, while the highest level, BSL-4, is reserved for agents which can cause severe, incurable diseases by airborn transmission.

**DNA (deoxyribonucleic acid)** – A molecule located within the nucleus of a cell that stores genetic information and codes instructions for how to build proteins.

**Dual-use research:** Scientific studies intended to produce results useful for academic or industrial purposes, but which could pose a threat to public health and/or national security if misused.

**E. Coli:** A bacteria common in the lower intestine. Most strains are harmless, but some can cause severe food poisoning.

**Epidemic:** A rapid increase in the incidence of a disease, significantly above the baseline level.

**Epidemiology:** The statistical study of distributions and patterns in health events, such as clinical trials or disease outbreaks.

**Interspecies transmission:** When a virus that commonly infects one species is transferred to a different species. For example, H5N1 commonly circulates in chickens and was transmitted to humans.

**Mutations:** Spontaneous changes in genomic sequences which may result from natural or artificial processes. Mutations introduced by scientists to H5N1 genome produced an airborn variant of the flu virus.

**NSABB:** The National Science Advisory Board for Biosecurity, a federal advisory committee composed on 25 voting members, experts in the life sciences, to guide oversight of dual-use research.

**Pandemic:** An *epidemic* that has spread to human populations over a wide geographic region.

**Recombinant DNA:** DNA sequences spliced together from multiple sources in the laboratory by molecular cloning to introduce novel properties to biological organisms.

**RNA (ribonucleic acid):** Molecules similar to DNA, used in biological organisms to carry messages that control protein synthesis. The genetic material of viruses can be encoded entirely on RNA, rather than DNA.

**World Health Organization (WHO):** An agency of the United Nations that studies issues in international public health.

**Vaccine:** A biological agent designed to provide immunity against a disease by stimulating the body's immune response to destroy infectious microorganisms.

**Virulence:** The ability of a virus or other parasite to cause disease in its host.

**Virus**: A small, non-bacterial agent that can cause diseases in biological organisms by infection. Viruses can only reproduce in the living cells of their host organisms.

## Resources:

Virology Blog's Influenza 101: http://www.virology.ws/influenza-101/

**Next Seminar (16 May, 2012):**

**Neglected Diseases of the Bottom Billion**

(Note: the Climate Change lecture will now be held on 30 May)

*****New lecture added!** Please join us on Wednesday, June 13th for a lecture on Particle Accelerators!***

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