

HCOL 185D: The Coming Plague
Fall 2016

Course Description:

Research is to see what everybody else has seen, and to think what nobody else has thought.
Albert Szent-Györgi (1893-1986), *Bioenergetics* (1957), 57.

You cannot depend on your eyes when your imagination is out of focus.
Mark Twain (1835-1910), *A Connecticut Yankee in King Arthur's Court* (1889).

The pathogen responsible for the next global human pandemic –The Coming Plague- almost certainly does not exist - yet. Evolution, however, will undoubtedly produce an agent that, provided just the right set of circumstances, might emerge to cause human disease on a global scale. Such a global pandemic isn't inevitable, it will only occur with the unwitting cooperation of *Homo sapiens*. In the first part of the course we will focus on our complicity in past and future outbreaks of infectious diseases. We will examine how researchers work to understand emerging pathogens, and how their success depends on their ability to draw together insights from a wide array of disciplines. In the second part of the course, students will be challenged to consider infectious agents from a completely different perspective. Instead of viewing them as pathogens, we will explore the role of infectious agents, specifically viruses, as essential elements of the evolution of life on Earth.

Class: 1:15 – 2:30, Tuesday/Thursday
016 UHTN

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Office Hours: By appointment.

Required Books: Steven Johnson , *The Ghost Map* (2006) (978-1594482694)
David Quammen, *Spillover* (2012) (978-0393346619)
Jacques Pepin, *The Origin of AIDS* (2011) (978-0521186377)
(I suggest purchasing these books from Amazon.com where together they list for less than \$60.)
Additional journal and newspaper articles will be posted on Blackboard

Course Goal:

To provide alternative perspectives on the interactions of humans and infectious agents, especially viruses. Students will gain an insight into the emergence of new viruses both as agents of human disease and as essential agents of the evolution of life on Earth.

Course Objectives:

- Gain an insight into to the ways in which humans have responded to emerging infectious diseases, as well as the role of human behavior in disease emergence.
- Gain an insight into how researchers approach the questions posed by the outbreak of a new infectious disease.
- Develop an appreciation for the interdisciplinary approaches required to address the perpetual challenge of emerging infectious diseases.
- Gain an appreciation for viruses as essential agents of the evolution of life on Earth.
- Develop an appreciation and respect for the unknowns of the microbial world.

Course Outline

Assigned summer reading: *The Ghost Map*

- Week 1: Introduction to course and approaches to scientific research
Background for emerging and re-emerging infectious disease
Mid-19th century London and the emergence of cholera
- Week 2: John Snow's and Henry Whitehead's investigations of the London contagion of 1854
The miasma theory of disease
Parallels in current events
- Week 3 *The Origin of AIDS*: An introduction to 20th century colonial Central Africa
Societies in transition
- Week 4 A perfect storm: the status of women, forced labor, and colonial medicine
Arrival of HIV in the Americas: profits and politics
Film: *And the Band Played On* (1993)
- Week 5 *Spillover*: An introduction to emerging infectious diseases
- Week 6 Human role in disease outbreaks
- Week 7 Specific outbreaks: Student presentations
- Week 8 Specific outbreaks: Student presentations

Mid-term Paper due 48 hours following the student presentation.

- Week 9 Viral pathogens: Good guys gone bad?
Essential agents of life on Earth
Viruses in our genome: the visitors that never left
- Week 10 In the beginning: viruses

Week 11	Viruses: The dark matter of biology The most abundant genetic elements on Earth
Week 12	Viruses: Dead or Alive?
Week 13	Viral giants: A fourth domain of life?
Week 14	Student presentations
Week 15	Student presentations

Final Paper due 12 noon on the Final Exam Day assigned by the Registrar.

Grading:

Active participation: 25%
 Weekly written assignments that address assigned reading: 30%
 Two group presentations: 25%
 Mid-term and Final papers: 20%

Active Participation:

Attendance is mandatory. Active participation in class discussions is expected. Evaluation of class participation will focus on content/insight, not verbiage. Electronics are not permitted in class.

Weekly written assignments:

Written assignments (usually ~1 page double-spaced) to be handed in on the day of discussion. Students will critically address one or two specific issues concerning the readings that will be discussed in class. In some cases, the written assignments may form the basis for a formal class debate.

No written assignments will be required for the weeks of student presentations.

Group presentations:

Groups of 2 or 3 students will present their research on a topic of their choice (to be approved by the instructor) in an ~30 minute PowerPoint presentation to the class. Each student in the class will fill out an evaluation form for each presentation. The results of the class evaluation will be compiled and shared (anonymously) with the presenters.

Midterm and Final Papers:

The paper will discuss in detail the topic presented by the student in their oral class presentation. It will include the analysis of at least one paper from the primary literature along with a complete bibliography.