

MB 512 Highlights of Microbiology

Winter Term 1 credit Tuesdays 1-2:20 in Nash 404

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Office Hours Wed and by Request

Course Objectives: Gain familiarity with the history of microbiology through reading, reviewing and presenting on great papers in the field.

Student Learning Outcomes:

At the end of this class, students will be able to:

- Synthesize and explain conceptual and technical developments in the field of microbiology
 - Demonstrate an understanding of several different fields of research in the Department of Microbiology at OSU
 - Use logical, connected thoughts in oral and written presentations.
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Learning Resources: Papers can be found in Brock's *Milestones in Microbiology* and other primary papers posted on the classes Canvas site. **Read and review the papers to be discussed before class.**

Overview: In class we will discuss classic papers in the field. Each week:

- a) One of us will lead the discussion on the paper and the rest will participate.
- b) Any week you are not presenting, you must contribute to the discussion including bringing up a paper that has likely resulted (at least tangentially) from the main paper being discussed. Each week there is a discussion board in which that paper citation needs to be put in. This can be a high level read of this paper, but should provide you a better understanding of the concepts that are being introduced.
- c) We will focus not only on the topic but the mechanism in which information is conveyed. Effective figures, non-effective figures.

This is also a seminar class that the focus is on discussion. This means that I do not allow laptops to be open except by the person presenting. Notebooks and printouts are welcome.

Grading:

1. Attendance, and in-class participation: 30%
2. Short paper reviews: 35%
3. Presentation on paper: 35%

Attendance is required: if you miss a class you will need to write an extra paper.

Grading Specifics:

1 and 2: Based on one of the papers presented or discussed in class or any paper in Brock's *Milestones in Microbiology*, write a 1-page paper in which you put the paper in the context of the history of microbiology, summarize its important findings, indicate why it was/is important, and explain any technical breakthroughs.

3: Choose one of the topics and present an oral summary of the topic for the class. Put the research presented in context, including background and hypotheses and its scientific, intellectual and global importance.

Schedule:

Week 1: Discussion of course materials, student requirements, and aims of the course. Student paper assignments will be agreed upon.

Week 2: Figure design discussion. Introduction to Illustrator and Photoshop.

Week 3: Spontaneous Generation

-Needham 1748 (Brock p. 11) & Spallanzani 1798 (Brock p. 13)

-Pasteur 1861 (Brock p. 43).

Week 4: Discovery of Viruses -

-Beijerinck, 1899 (Brock p. 153); (Twort &) Felix d'Herelle, 1917 (Brock p. 157);

-Stanley, 1935 (Brock p. 160).

Week 5: Etiology of Disease

-Robert Koch (1882, 1884): (Brock p. 109-118).

- Side reading: Hesse 1992 – Walther and Angewlina Hesse – Early contributors to Bacteriology

Week 6: DNA as the Hereditary Material

-Griffith, 1928 *Journal of Hygiene*;

-Avery McCleod, McCarty 1944 *J Exper Medicine*;

-Hershey & Chase, 1952 *J. Gen. Physiol* ()

Week 7: Molecular Cloning

-Luria and Delbruck, 1943 *Genetics*

-Brenner, Jacob, Meselson 1961 *Nature*

-Conen et al., 1973 *PNAS*

Week 8: Tree of Life

-Woese and Fox, 1977 *PNAS*;

-Fox Pechman & Woese 1977 *Int. J. Syst. Bacteriol.*

Week 9: Genomics -

-Fraser et al. 1995 *Science*;

-Fleishman et al. 1995 *Science*.

Week 10: TBD