

Mastery Series: A Brief History of Microbiology

1. Compare the contributions of Leeuwenhoek and Hooke (what was their time period?).
2. Why is Jenner's contribution particularly controversial?
3. Compare the contributions of Pasteur and Koch (what was their time period?).
4. Explain how Koch determined the causative agent of Anthrax.
5. Compare the contributions (and time period) of Nightingale, Semmelweis and Lister.
6. Describe how Fleming discovered penicillin (and how it was named).

Mastery Series ANSWERS: A Brief History

1. Compare the contributions of Leeuwenhoek and Hooke (what was their time period?).
Late 1600's; Hooke built the first compound microscope (2 lenses) and coined the term "cell"/Leeuwenhoek described many common bacteria and protists with his exquisite drawings/Leeuwenhoek built a microscope that looks quite different than what we commonly see today, but it did work.
2. Why is Jenner's contribution particularly controversial?
First vaccine. Questionable ethics of inoculating a child to see if the vaccine worked
3. Compare the contributions of Pasteur and Koch (what was their time period?).
Late 1800's. Pasteur and Koch both examined the processes of fermentation; both are credited as key players in the development of the Germ Theory of Disease; Pasteur is credited with the first rabies vaccination and disproving Spontaneous Generation. Koch is credited with "Koch's Postulates" as a method for identifying the causative agent of a disease.
4. Explain how Koch determined the causative agent of Anthrax.
He withdrew a blood sample from a cow; grew and purified the culture in the lab; examined it and found long rods (bacilli); injected a pure sample into a lab rat, which then developed Anthrax. He withdrew a sample from the lab rat and confirmed microscopically that the same bacteria was growing the rat that grew in the cow.
5. Compare the contributions (and time period) of Nightingale, Semmelweiss, and Lister.
Mid-late 1800's.
Nightingale, Semmelweiss and Lister all were instrumental in advocating that sterile conditions in hospitals reduces post-surgery and patient-to-patient infection.
Nightingale promoted cleanliness around soldier barracks to prevent *Salmonella typhi* (typhoid fever).
Lister promoted the use of a disinfectant (carbolic acid) during surgeries and in wound care.
Semmelweiss demanded clean hands by doctors in Vienna, which reduced post-birth infections.
6. Describe how Fleming discovered penicillin (and how it was named).
He was growing *Staphylococcus* (a bacteria), and the plate was contaminated with mold. However, when he looked carefully, he noticed that the mold was producing something that inhibited the bacterial growth. The mold's name is *Penicillium*, so the purified antibiotic he recovered was named Penicillin.