

BACTE211

LEC 1: INTRO TO MICROBIOLOGY

> study of microorganism (cannot be seen by the naked eye/microscopic)

1. Bacteria
2. Fungi
3. Virology
4. Parasite
5. protozoans

HISTORY

Anton van Leeuwenhoek

• first observations of bacteria at the **microscopic level**, (30-266x magnification)

> He used water from his environment as specimen

> **Father of protozoology and bacteriology**

> **first drawings of bacteria (1684)**

• **Huygens**: free-living protozoa

• **Robert Hooke (1667)**: filamentous microscopic fungi

> his microscope has **larger magnification**

> there are 2 types of fungi:

- Yeast - 37 degrees
- mold- *amag/carbo* are favorable in fungi- 25 degrees

degrees

• **Pietro Antonio Micheli**: described 900 species of molds

During the time of Anton to Pietro di daw nila na bacteria nag cacause ng disease

Cicero and Fracastorius- fevers (inflammatory response to the infection) might be caused by minute animals (contagium vivum).

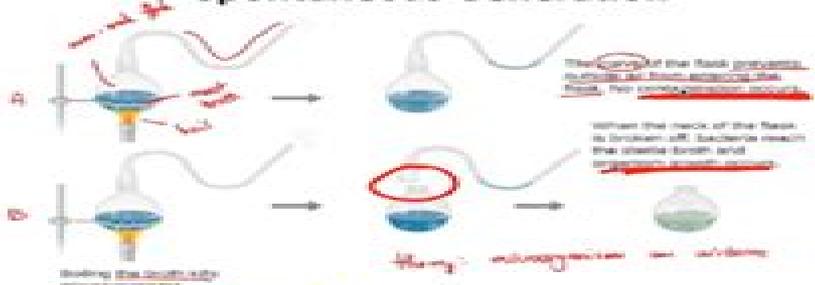
Spontaneous Generation "living things arise from nonliving things" Jan Baptist Van Helmont

rat/mice tas lagyan mo ng wheat kernel/rags sa container after 3 weeks meron ng rat/mice

Louis Pasteur

• when air is filtered through cotton wool, large numbers of microorganisms are held back.

Spontaneous Generation



John Tyndall

• existence of heat-stable forms of certain bacteria

• removal of which involved the process of **repeated heating and rest called "tyndalization"**

Reservoir:

1. **Human**- if it is normally living in the body- normal flora/normal microbiota > do not cause disease > they need nutrients, carbon(CHO, CHOO), nitrogen, energy(ATP)

2. **Environment** water and soil

3. **Animals**

> Signs and symptoms won't be enough to identify/diagnose the disease we need lab

INSTRUMENT PROGRESS:

• To progress

- Improvement in **microscopes**
- Development of methods for **culturing microorganisms**

Workflow means step by step procedure to identify the organisms

1. **Specimen collection** > infection sites

2. **Direct microscopic examination** > tignan directly from the specimen

3. **Culture** > we inoculate in culture media and then incubate

4. **Bacterial identification**

> **macroscopic exam** - we looked for growth pattern (**colony**) w/o using microscope; its shape, texture, color, etc.

> **microscopic matter** - characters viewed under microscope; its shape, arrangement

5. biochemical test

Robert Hooke (end of 16th century)

- Microscope with 3-500x
- Recognized cellular structure

Ferdinand Cohn (1849)

- staining of histological specimens

Carmine and hematoxylin > they are vegetable dyes s mabilis mag fade away; pang tissue din to

Robert Koch (1877)

> **methylene blue** to stain bacteria- it targets the cell wall of the bacteria and specific to it, up until now we used this

Robert Koch (1882)

• staining the **tubercle bacillus/mycobacterium tuberculosis/acid fast bacillus** (impenetrable to stain kasi made up daw ng ↑ fatty acid(mycolic acid) with methylene blue; we still use acid fast staining

- Employing **heat** for the stain to penetrate the waxy envelope



coccus is singular

Pharmaceutical Microbiology Lecture Notes

Hongru Du



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Table of Contents Pharmaceutical Microbiology Lecture Notes

1. Understanding the eBook Pharmaceutical Microbiology Lecture Notes
 - The Rise of Digital Reading Pharmaceutical Microbiology Lecture Notes
 - Advantages of eBooks Over Traditional Books
2. Identifying Pharmaceutical Microbiology Lecture Notes
 - Exploring Different Genres
 - Considering Fiction vs. Non-Fiction
 - Determining Your Reading Goals
3. Choosing the Right eBook Platform
 - Popular eBook Platforms
 - Features to Look for in an Pharmaceutical Microbiology Lecture Notes
 - User-Friendly Interface
4. Exploring eBook Recommendations from Pharmaceutical Microbiology Lecture Notes
 - Personalized Recommendations

- Pharmaceutical Microbiology Lecture Notes User Reviews and Ratings
- Pharmaceutical Microbiology Lecture Notes and Bestseller Lists
- 5. Accessing Pharmaceutical Microbiology Lecture Notes Free and Paid eBooks
 - Pharmaceutical Microbiology Lecture Notes Public Domain eBooks
 - Pharmaceutical Microbiology Lecture Notes eBook Subscription Services
 - Pharmaceutical Microbiology Lecture Notes Budget-Friendly Options
- 6. Navigating Pharmaceutical Microbiology Lecture Notes eBook Formats
 - ePub, PDF, MOBI, and More
 - Pharmaceutical Microbiology Lecture Notes Compatibility with Devices
 - Pharmaceutical Microbiology Lecture Notes Enhanced eBook Features
- 7. Enhancing Your Reading Experience
 - Adjustable Fonts and Text Sizes of Pharmaceutical Microbiology Lecture Notes
 - Highlighting and Note-Taking Pharmaceutical Microbiology Lecture Notes
 - Interactive Elements Pharmaceutical Microbiology Lecture Notes
- 8. Staying Engaged with Pharmaceutical Microbiology Lecture Notes
 - Joining Online Reading Communities
 - Participating in Virtual Book Clubs
 - Following Authors and Publishers Pharmaceutical Microbiology Lecture Notes
- 9. Balancing eBooks and Physical Books Pharmaceutical Microbiology Lecture Notes
 - Benefits of a Digital Library
 - Creating a Diverse Reading Collection Pharmaceutical Microbiology Lecture Notes
- 10. Overcoming Reading Challenges
 - Dealing with Digital Eye Strain
 - Minimizing Distractions
 - Managing Screen Time
- 11. Cultivating a Reading Routine Pharmaceutical Microbiology Lecture Notes
 - Setting Reading Goals Pharmaceutical Microbiology Lecture Notes
 - Carving Out Dedicated Reading Time
- 12. Sourcing Reliable Information of Pharmaceutical Microbiology Lecture Notes
 - Fact-Checking eBook Content of Pharmaceutical Microbiology Lecture Notes

- Distinguishing Credible Sources
- 13. Promoting Lifelong Learning
 - Utilizing eBooks for Skill Development
 - Exploring Educational eBooks
- 14. Embracing eBook Trends
 - Integration of Multimedia Elements
 - Interactive and Gamified eBooks

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