

# 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*).

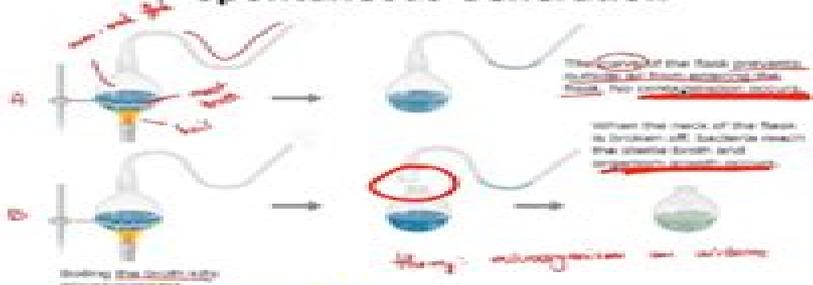
**Spontaneous Generation** "living things arise from nonliving things" Jan Baptist Van Helmont

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

**Morphology:**

- 1. coccus (spherical)
- 2. bacillus (rod)
- 3. spirillum (spiral)

coccus is singular

# Pharmaceutical Microbiology Lecture Notes

**J Spring**



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