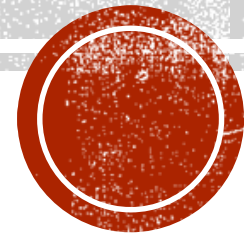
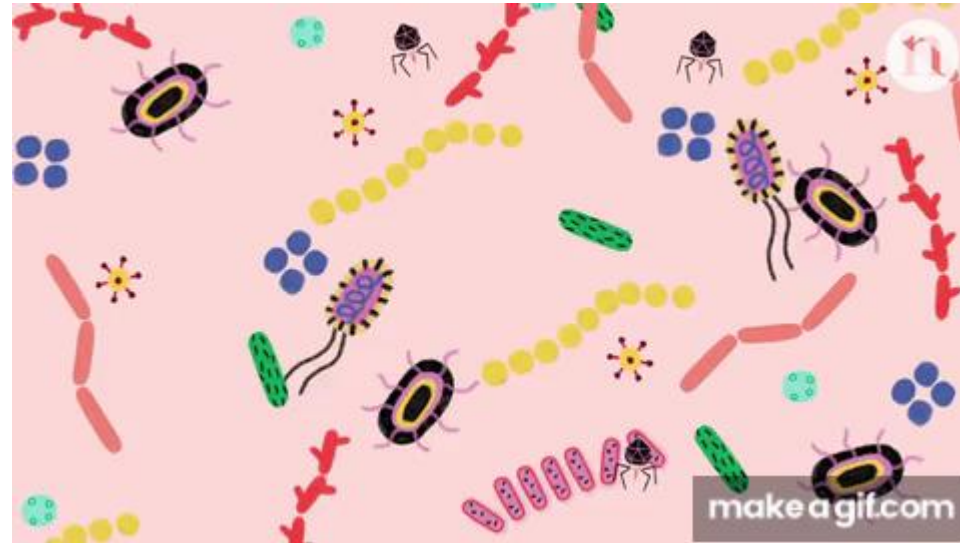
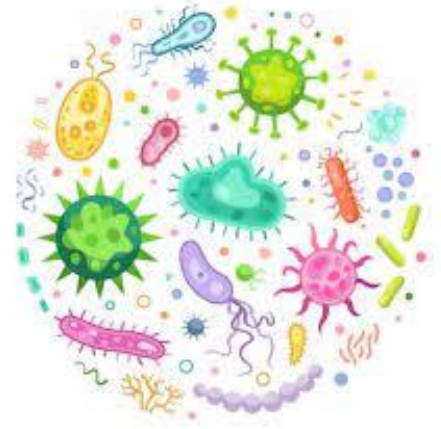


# MICROBIOLOGY



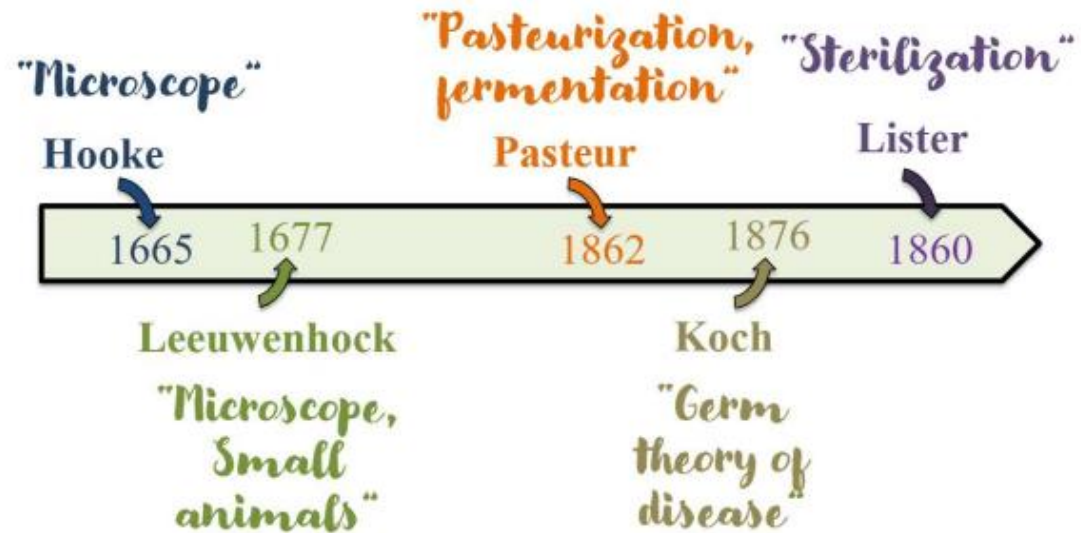
# WELCOME TO THE NEW WORLD



# DISCOVERY OF MICROORGANISMS

## Microbiology

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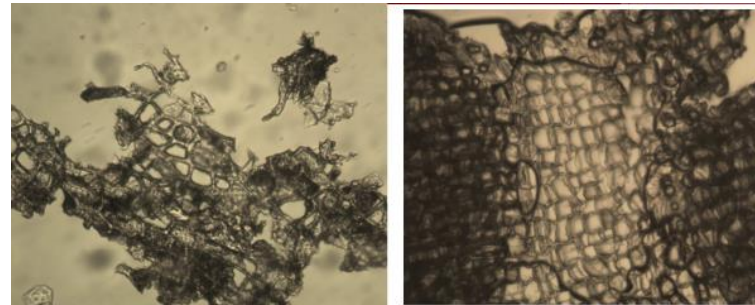


# ROBERT HOOKE (1635-1703)



- ▶ No direct contribution to microbiology.
- ▶ Built up the **first microscope**.
- ▶ Observed living organisms.

cork



# ANTONI VAN LEEUWENHOEK (1632-1723)



- ▶ Lens maker.
- ▶ Made **microscopes**.
- ▶ **First observation** of tiny organisms under the microscope.
- ▶ Called them **small animals**.



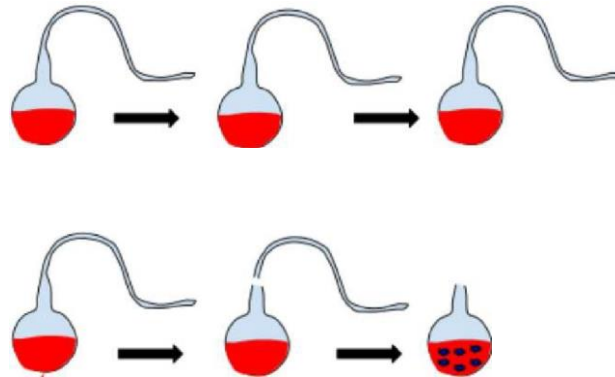
# LOUIS PASTEUR (1822-1895)

- ▶ Founder of the microbiology field.
- ▶ Germs are everywhere!
- ▶ **Pasteurization:** heating to kill germs.



# LOUIS PASTEUR (1822-1895)

- Disproved the **spontaneous generation theory**: Living things grow only from living germs.





# LOUIS PASTEUR (1822-1895)

- **Fermentation:** conversion of sugar into alcohol (1857)





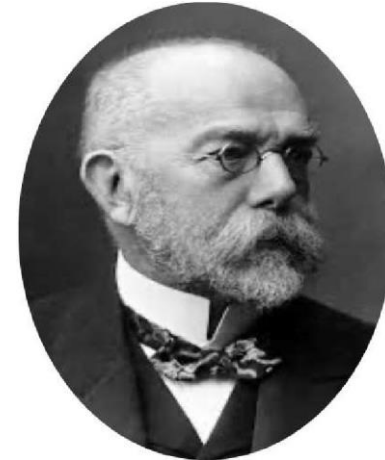
# LOUIS PASTEUR (1822-1895)

## ► Vaccination:

- Weakening of a microorganism and injection of this weakened form will train the immune system and protect against the living pathogen.
- Ex: Chicken cholera



# ROBERT KOCH (1843-1910)



- ▶ Some microorganisms can cause diseases.
- ▶ Founded the **bacteriology** field.
- ▶ Identification of bacteria responsible for anthrax, tuberculosis, cholera, diphtheria and many others.



# ROBERT KOCH (1843-1910)

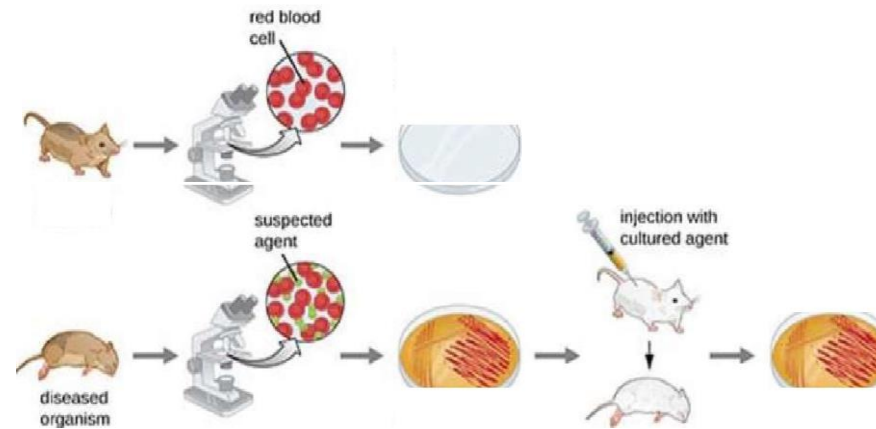
## ► Koch's Postulates

- 1 The bacteria must be present in every case of the disease.
- 2 The bacteria must be isolated from the host with the disease and grown in pure culture.
- 3 The specific disease must be reproduced when a pure culture of the bacteria is inoculated into a healthy susceptible host.
- 4 The bacteria must be recoverable from the experimentally infected host.



# ROBERT KOCH (1843-1910)

## ▪ Koch's Postulates



1 The suspected causative agent must be absent from all healthy organisms but present in all diseased organisms.

2 The causative agent must be isolated from the diseased organism and grown in pure culture.

3 The cultured agent must cause the same disease when inoculated into a healthy, susceptible organism.

4 The same causative agent must then be reisolated from the inoculated, diseased organism.



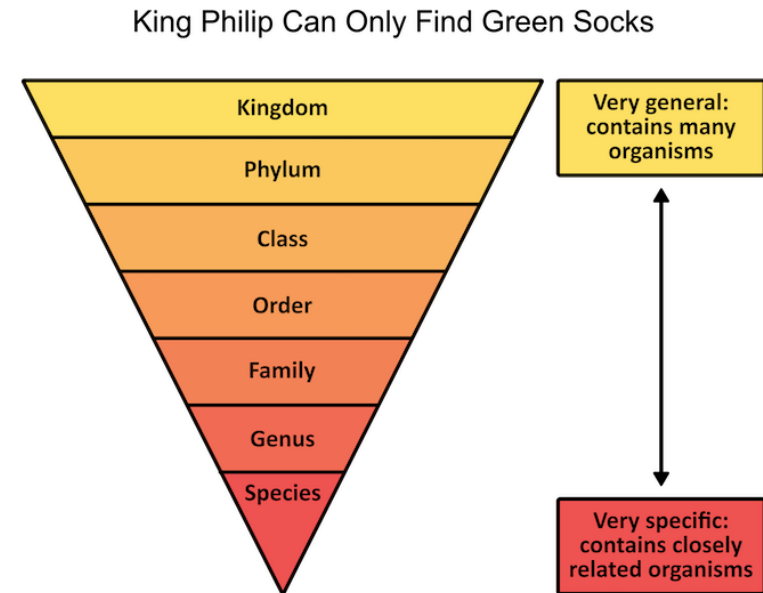
# JOSEPH LISTER (1827-1912)

- ▶ Pioneer of **antiseptic surgery**.
- ▶ Sterilization of instruments used during surgical interventions.
- ▶ Decrease of mortality rates due to bacterial **sepsis**.
- ▶ "Father of the modern surgery"



# NOMENCLATURE IN MICROBIOLOGY

- **Naming** of microorganisms was established in 1735 by Carolus Linnaeus.
- Two names for each organism
- The **genus**: first name, capitalized
- **Specific epithet**: species name, not capitalized
- ▶ Both names in **italic**.
- ▶ Ex: *Staphylococcus aureus*



# NOMENCLATURE IN MICROBIOLOGY

- ▶ To abbreviate, use the **initial of the genus** followed by the
  - **specific epithet (species name)**.
- ▶ *S. aureus, E. coli, P aeruginosa*
- ▶ When you use the name of the bacteria for the first time in your text, write the full name first, then use the abbreviation.

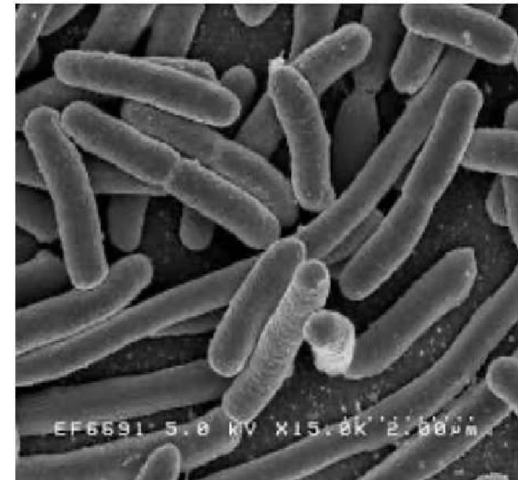




# NOMENCLATURE IN MICROBIOLOGY

► Ex: *Escherichia coli*

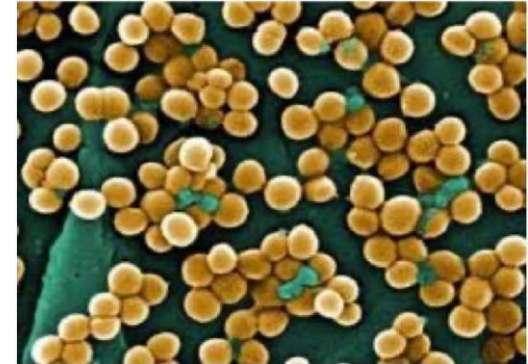
- *Escherich*: from the scientist who discovered *E. coli*, Theodor Escherich.
- *coli*: lives in the colon.



# NOMENCLATURE IN MICROBIOLOGY

► Ex: *Staphylococcus aureus*

- *Staphylo-*: arrangement of bacterial cells
- *coccus*: round shape of bacterial cells
- *aureus*: means golden in Latin, the color of the bacteria



# NOMENCLATURE IN MICROBIOLOGY

► Ex: *Shigella dysenteriae*

- *Shigella*: named after the Japanese bacteriologist K. Shiga (1896)
- *dysenteriae*: causes dysentery

