SNS COLLEGE OF PHARMACY AND HEALTH SCIENCES

Affiliated To The Tamil Nadu Dr. MGR Medical University, Chennai

Approved by Pharmacy Council of India, New Delhi.

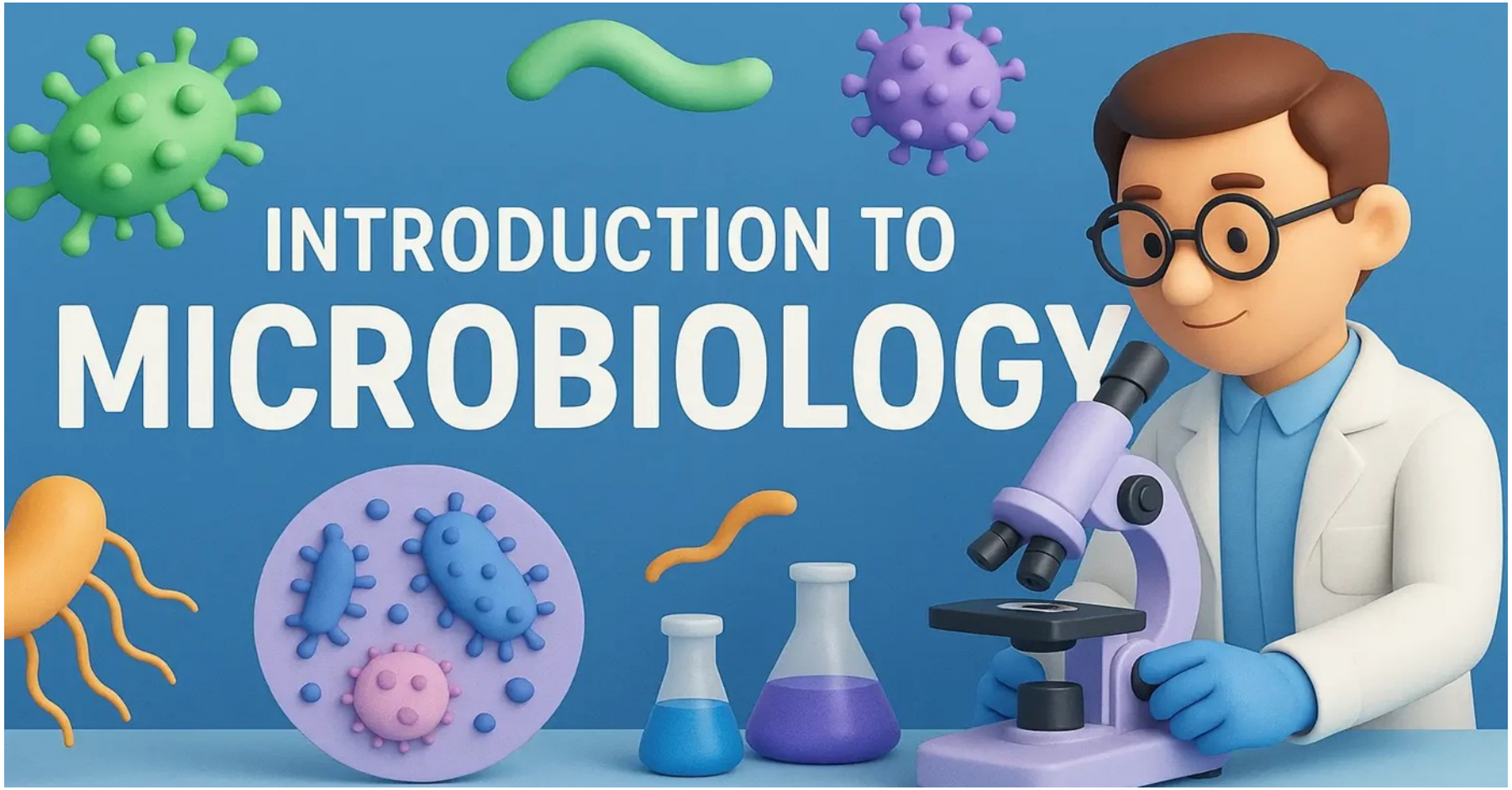
Coimbatore -641035

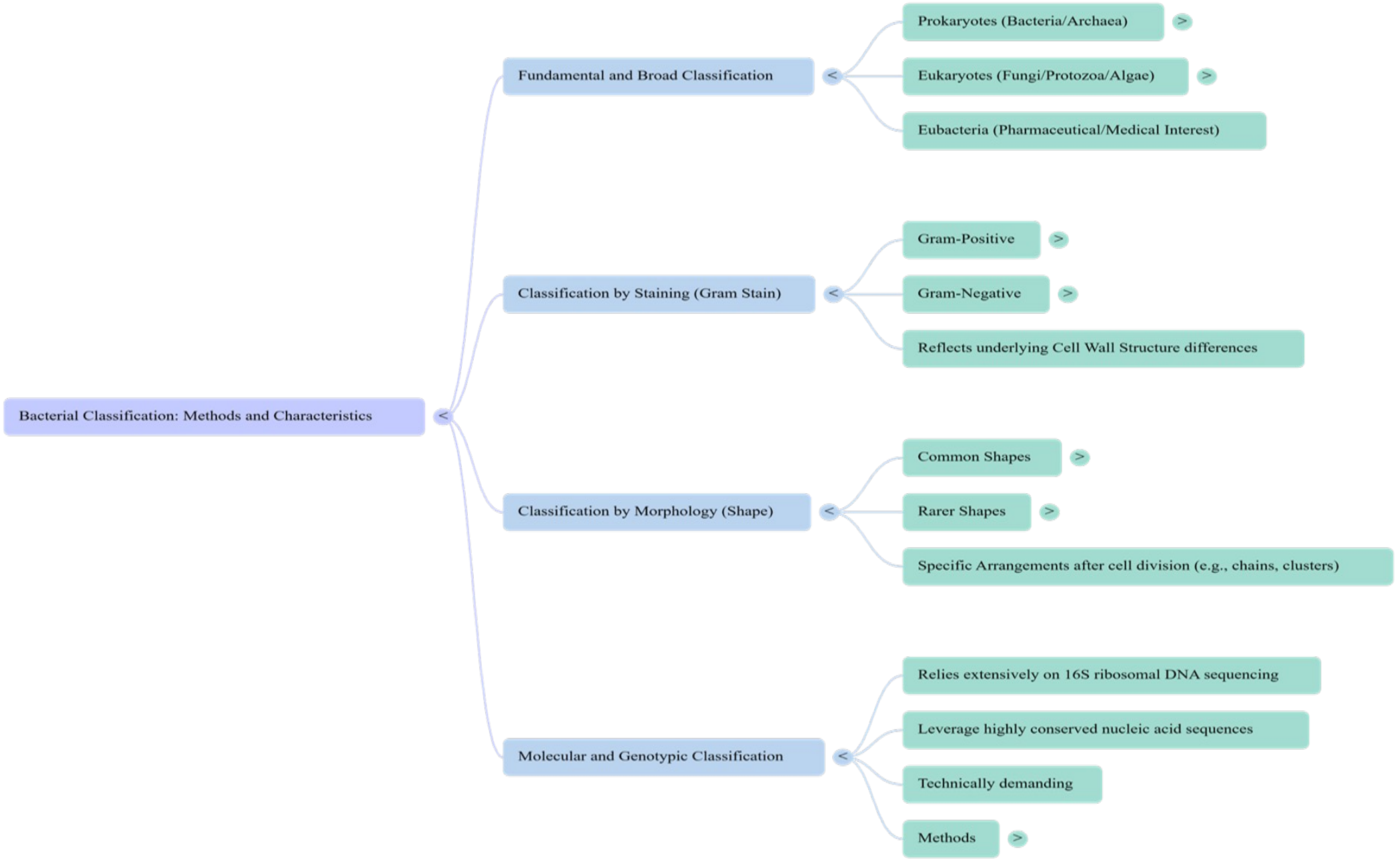
COURSE NAME : PHARMACEUTICAL MICROBIOLOGY - BP303 T

B.PHARM II YEAR / III SEM

UNIT 1

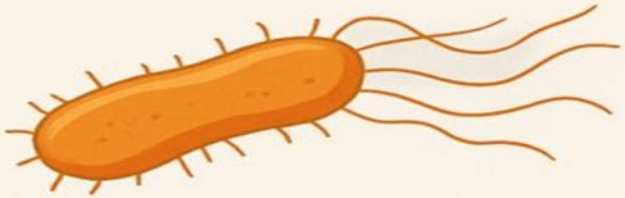
SUB TOPIC : HISTORY AND SCOPE OF MICROBIOLOGY


INTRODUCTION TO
MICROBIOLOGY


Bacterial Classification: Methods and Characteristics
Fundamental and Broad Classification
Prokaryotes (Bacteria/Archaea)
Eukaryotes (Fungi/Protozoa/Algae)
Eubacteria (Pharmaceutical/Medical Interest)
Classification by Staining (Gram Stain)
Gram-Positive
Gram-Negative
Reflects underlying Cell Wall Structure differences
Classification by Morphology (Shape)
Common Shapes
Rarer Shapes
Specific Arrangements after cell division (e.g., chains, clusters)
Molecular and Genotypic Classification
Relies extensively on 16S ribosomal DNA sequencing
Leverage highly conserved nucleic acid sequences
Technically demanding
Methods

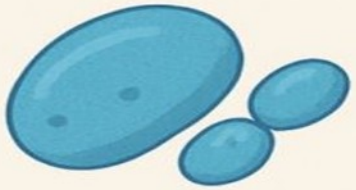
Microbiology is the study of tiny living things like bacteria, viruses, fungi, and parasites.

Plasmodium



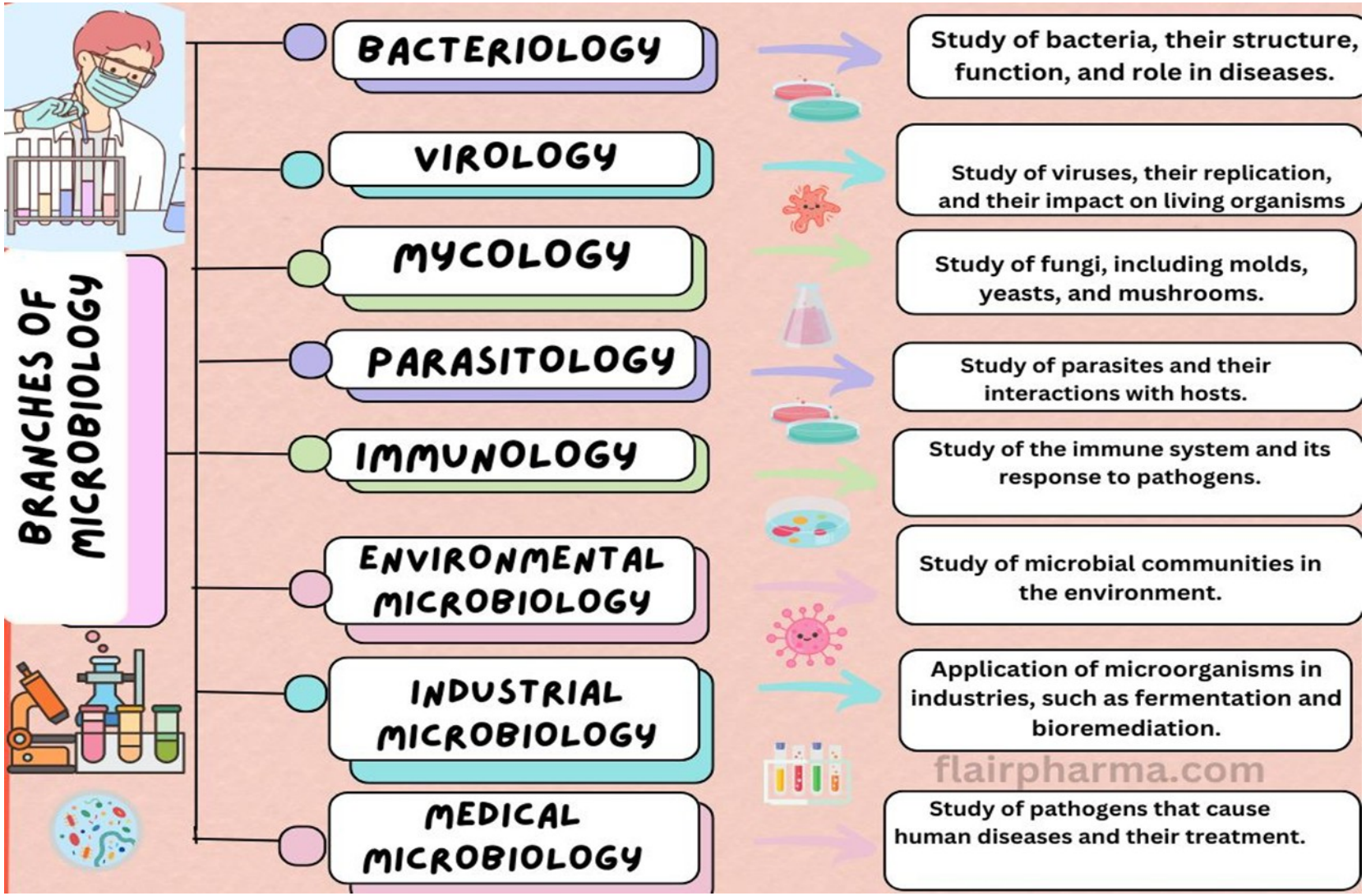
Salmonella

Lactobacillus



Candida

You can't see them with your eyes, but they're always around – on your skin, in your food, in the air, even inside your body.


BRANCHES OF MICROBIOLOGY
BACTERIOLOGY
Study of bacteria, their structure, function, and role in diseases.
VIROLOGY
Study of viruses, their replication, and their impact on living organisms
MYCOLOGY
Study of fungi, including molds, yeasts, and mushrooms.
PARASITOLOGY
Study of parasites and their interactions with hosts.
IMMUNOLOGY
Study of the immune system and its response to pathogens.
ENVIRONMENTAL MICROBIOLOGY
Study of microbial communities in the environment.
INDUSTRIAL MICROBIOLOGY
Application of microorganisms in industries, such as fermentation and bioremediation.
MEDICAL MICROBIOLOGY
Study of pathogens that cause human diseases and their treatment.
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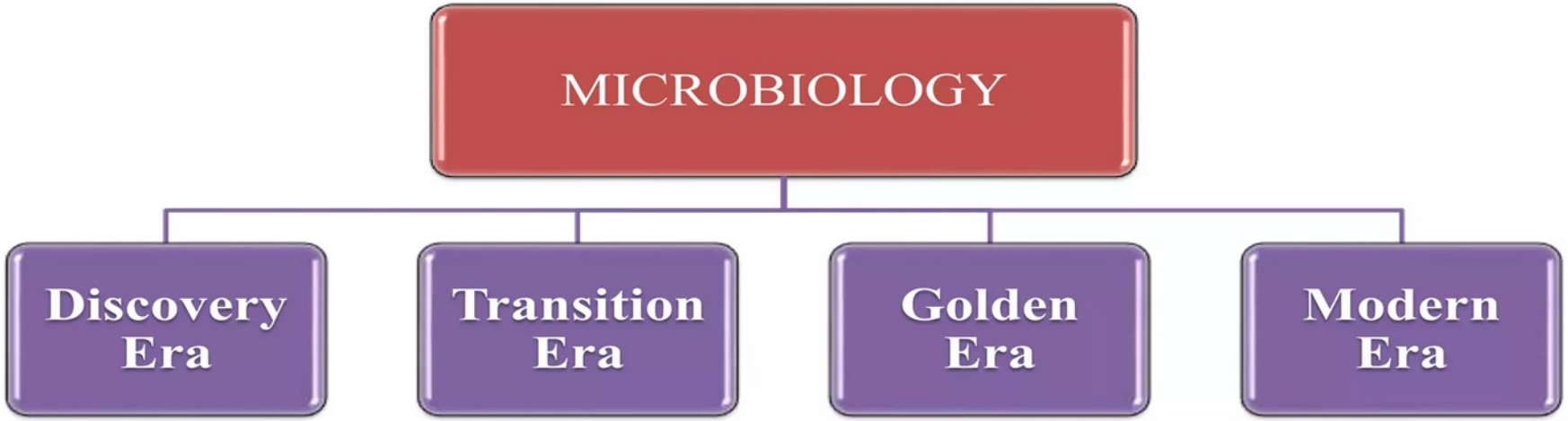
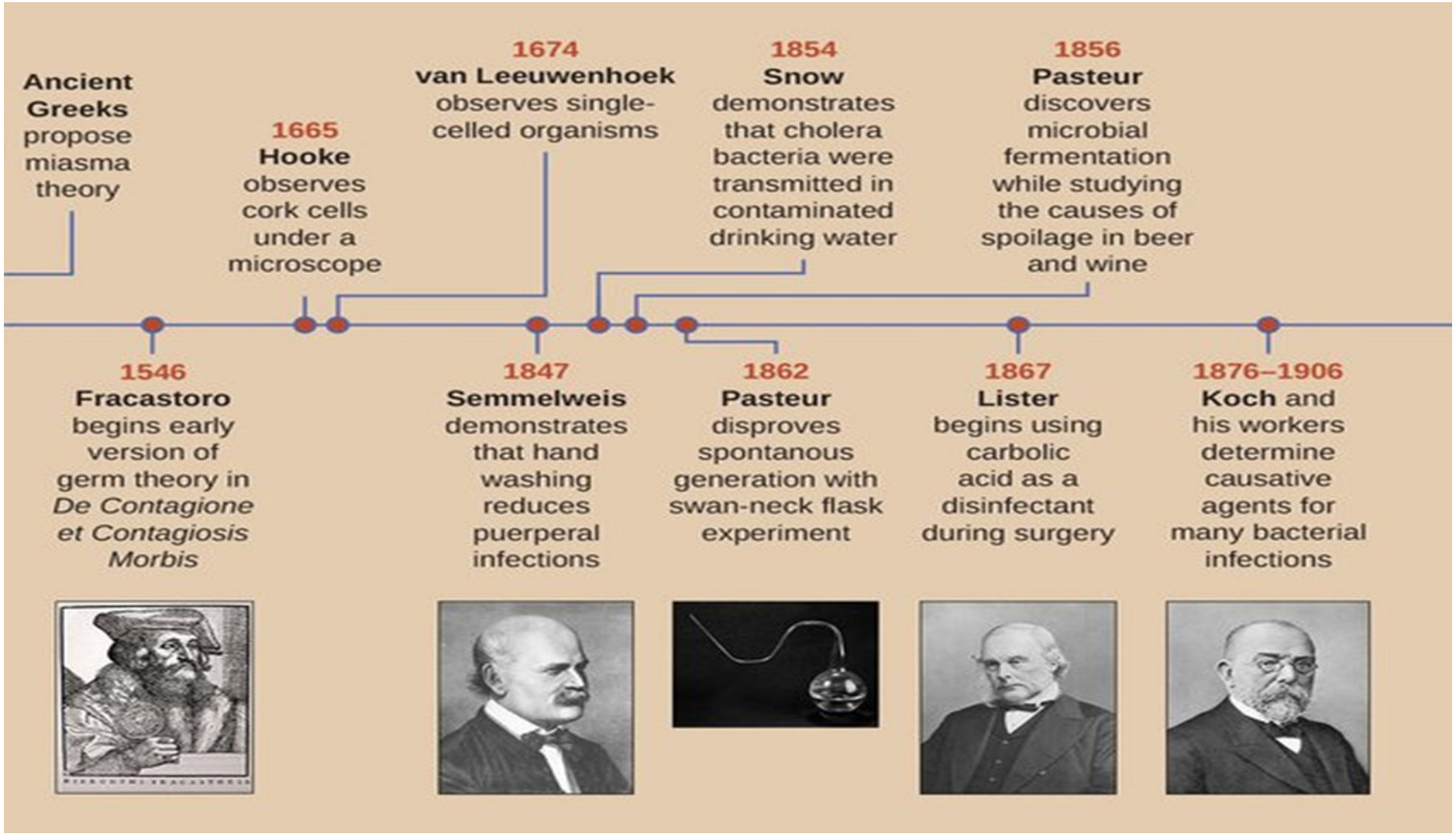
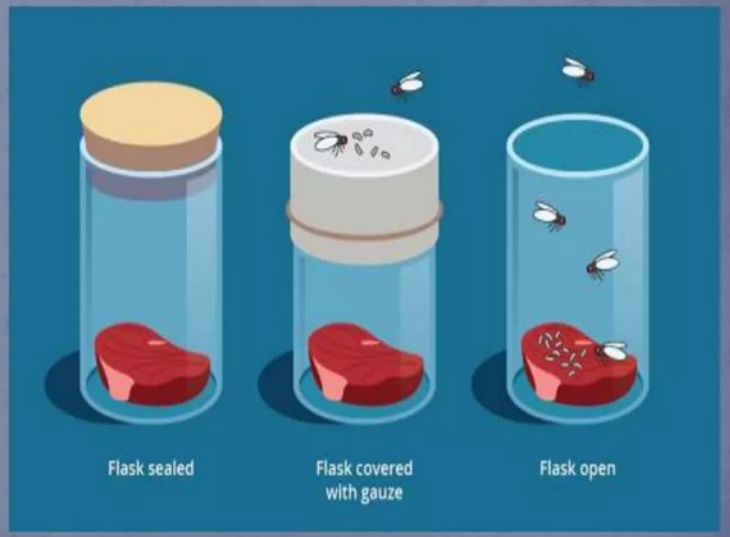

MICROBIOLOGY
Discovery Era
Transition Era
Golden Era
Modern Era



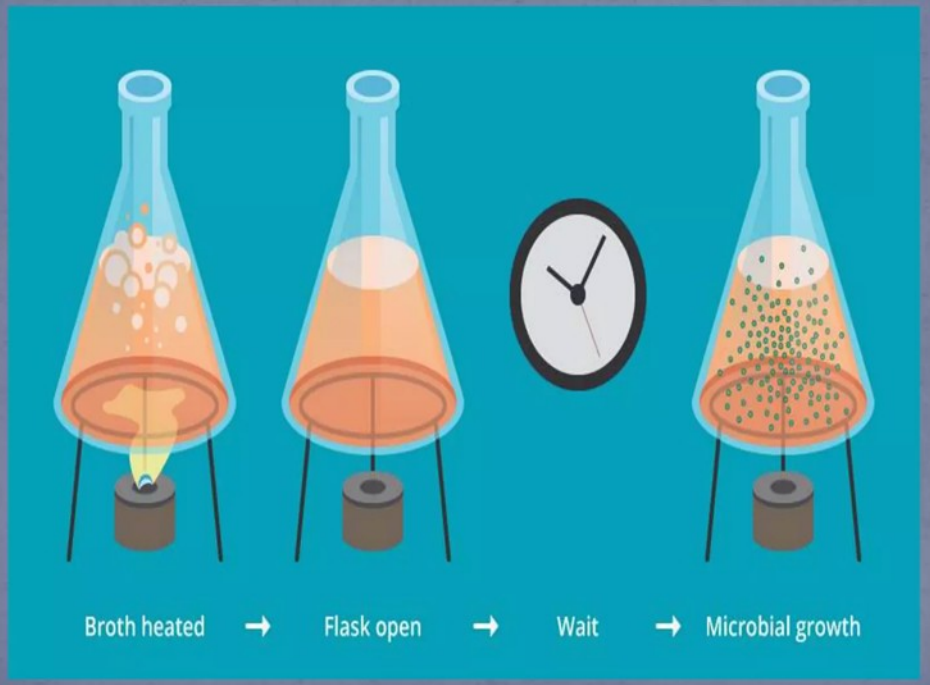
TRANSITION ERA:

Francesco Redi (1626 - 1697)

He showed that maggots would not arise from decaying meat, when it is covered.

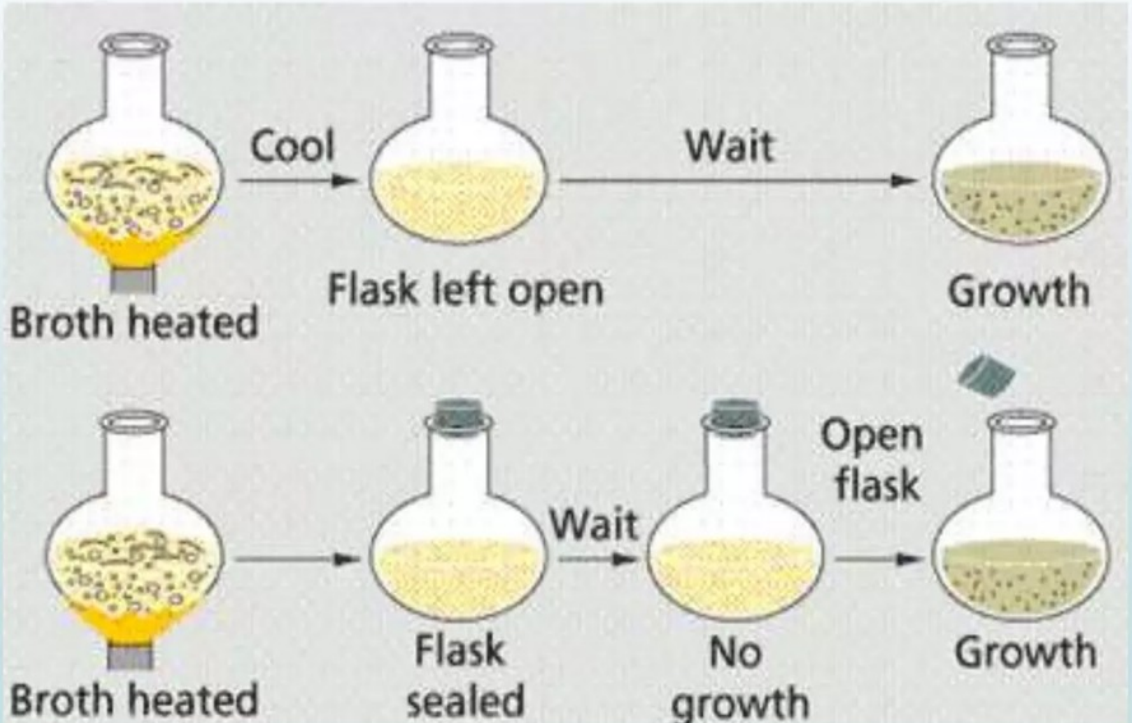


JOHN NEEDHAM'S EXPERIMENT

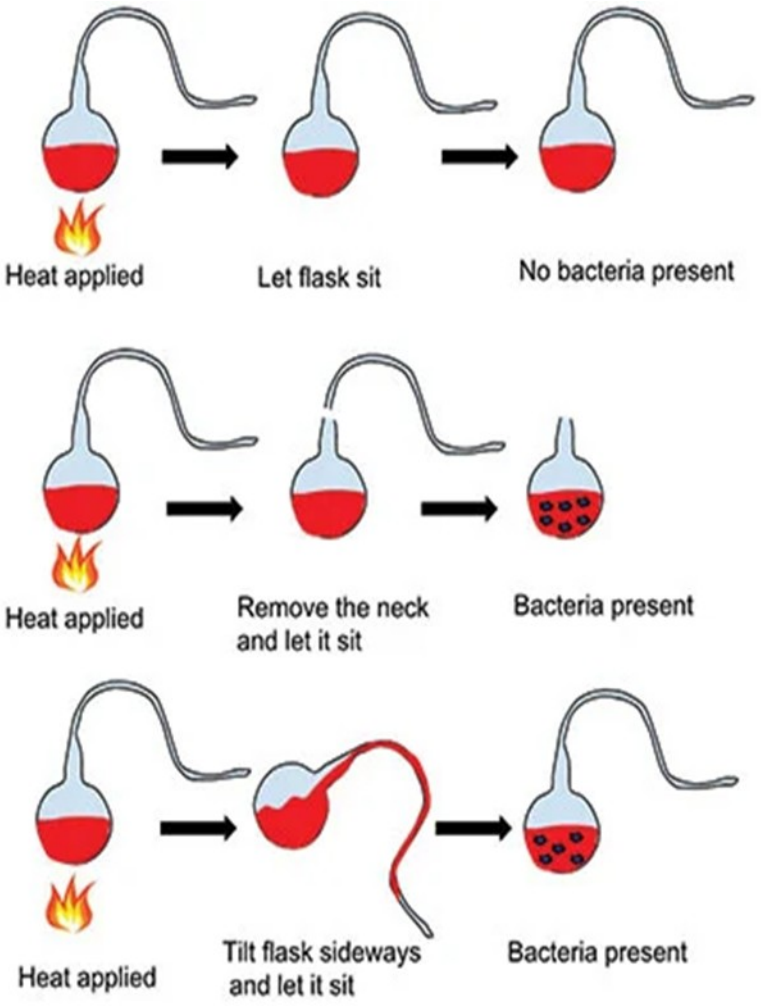


Lazzaro spallanzai (1729 – 1799)

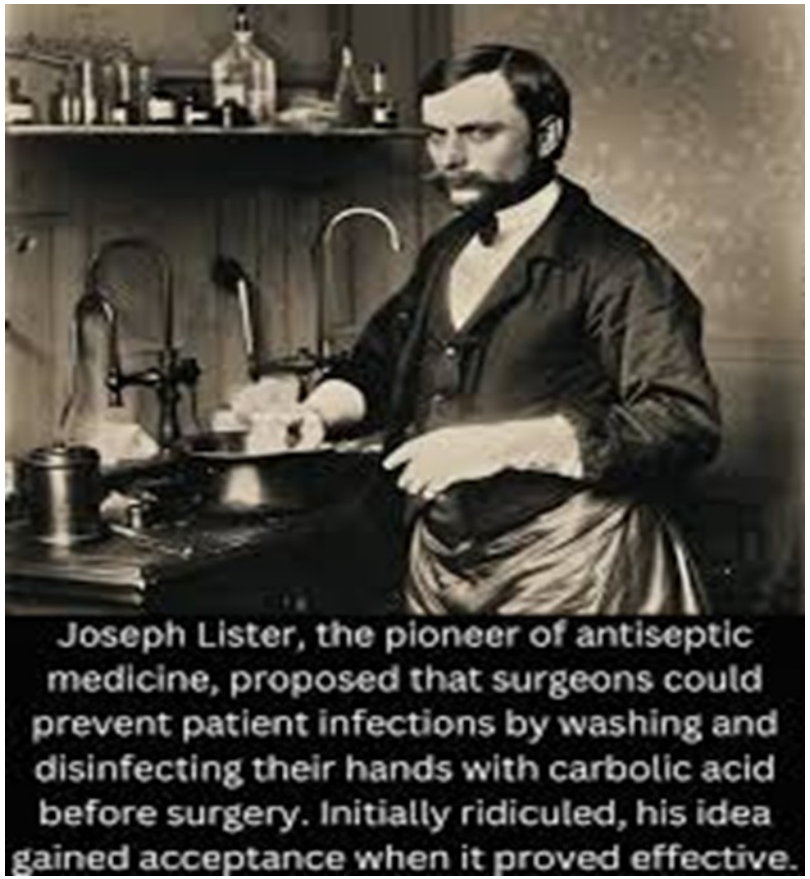
- He demonstrated that air carried germs to the culture medium.
- He showed that boiled broth would not give rise to microscopic forms of life.

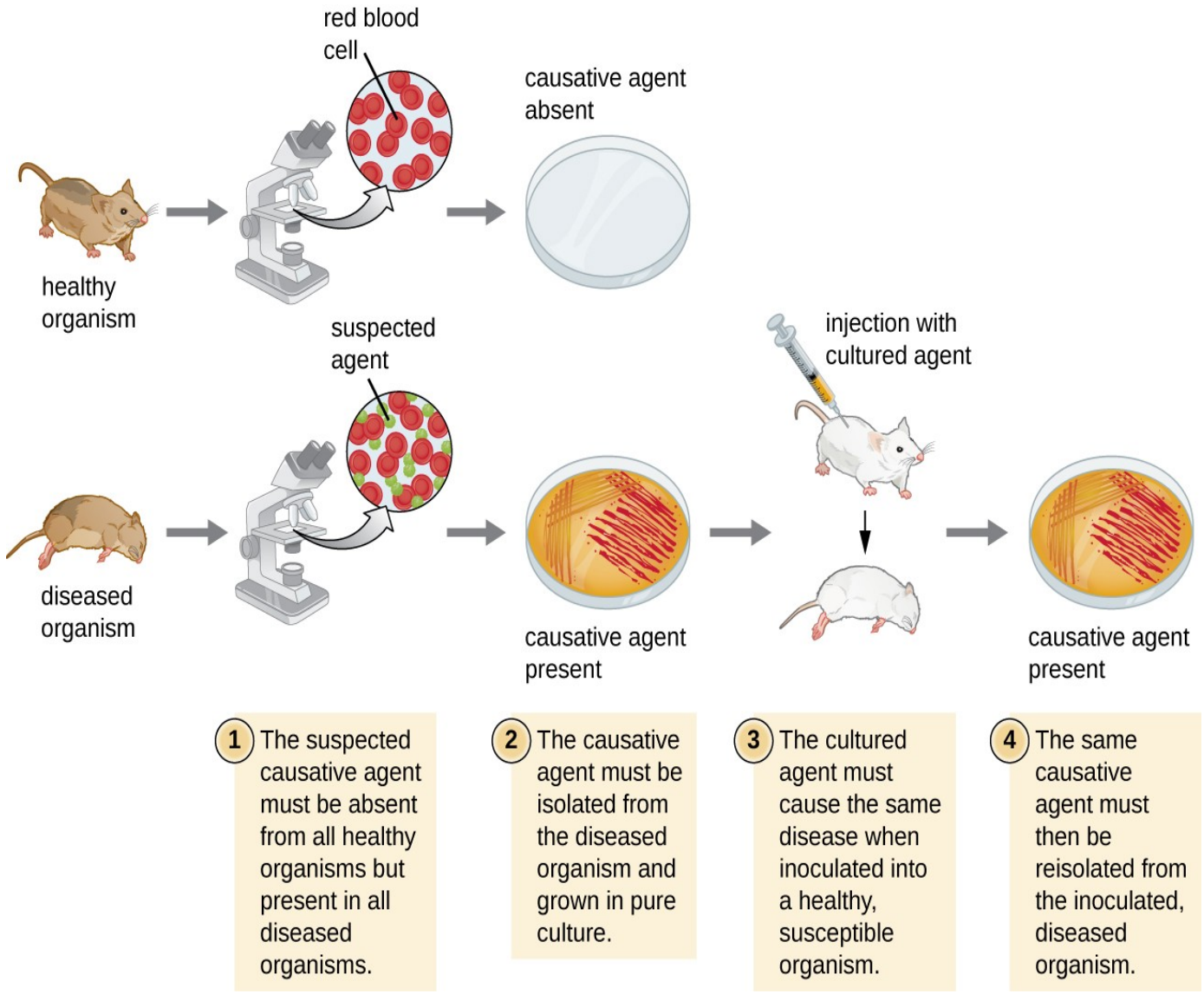


Modern Microbiology
Louis Pasteur



Lord Joseph Lister (1827-1912)





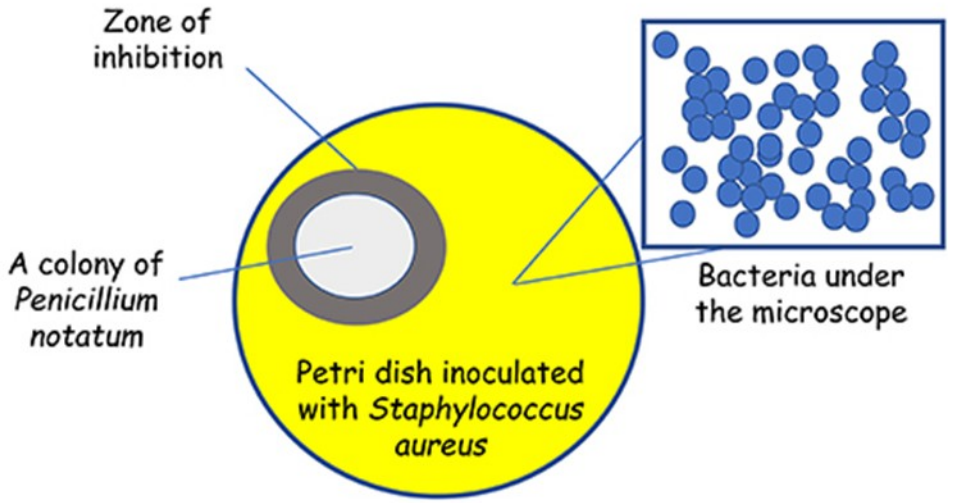
Robert Koch (1843 - 1910)

Alexander Fleming
He discovered the world's first antibiotic substance benzylpenicillin (penicillin G) from mould Penicillium notatum in 1928.

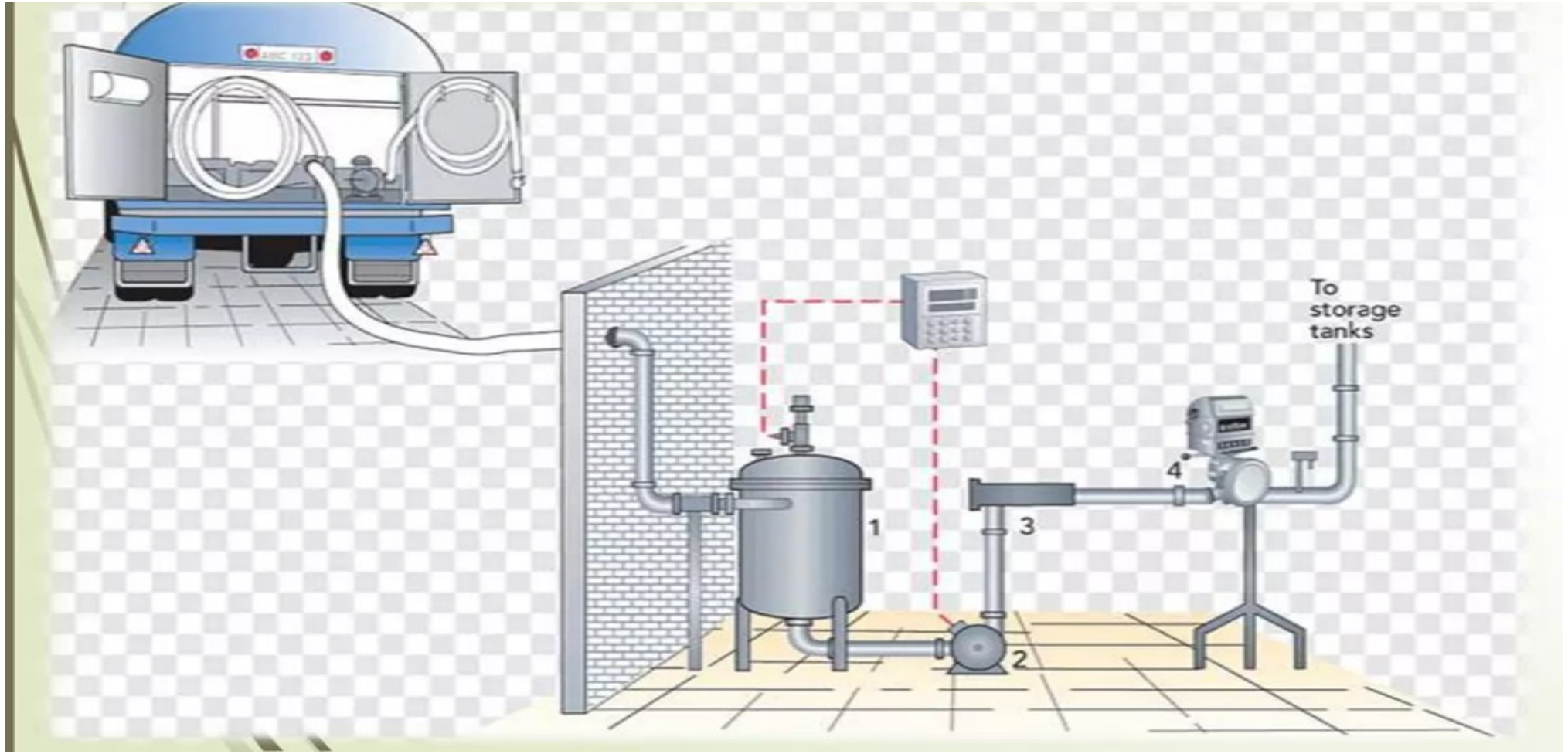
A

Alexander Fleming in his laboratory

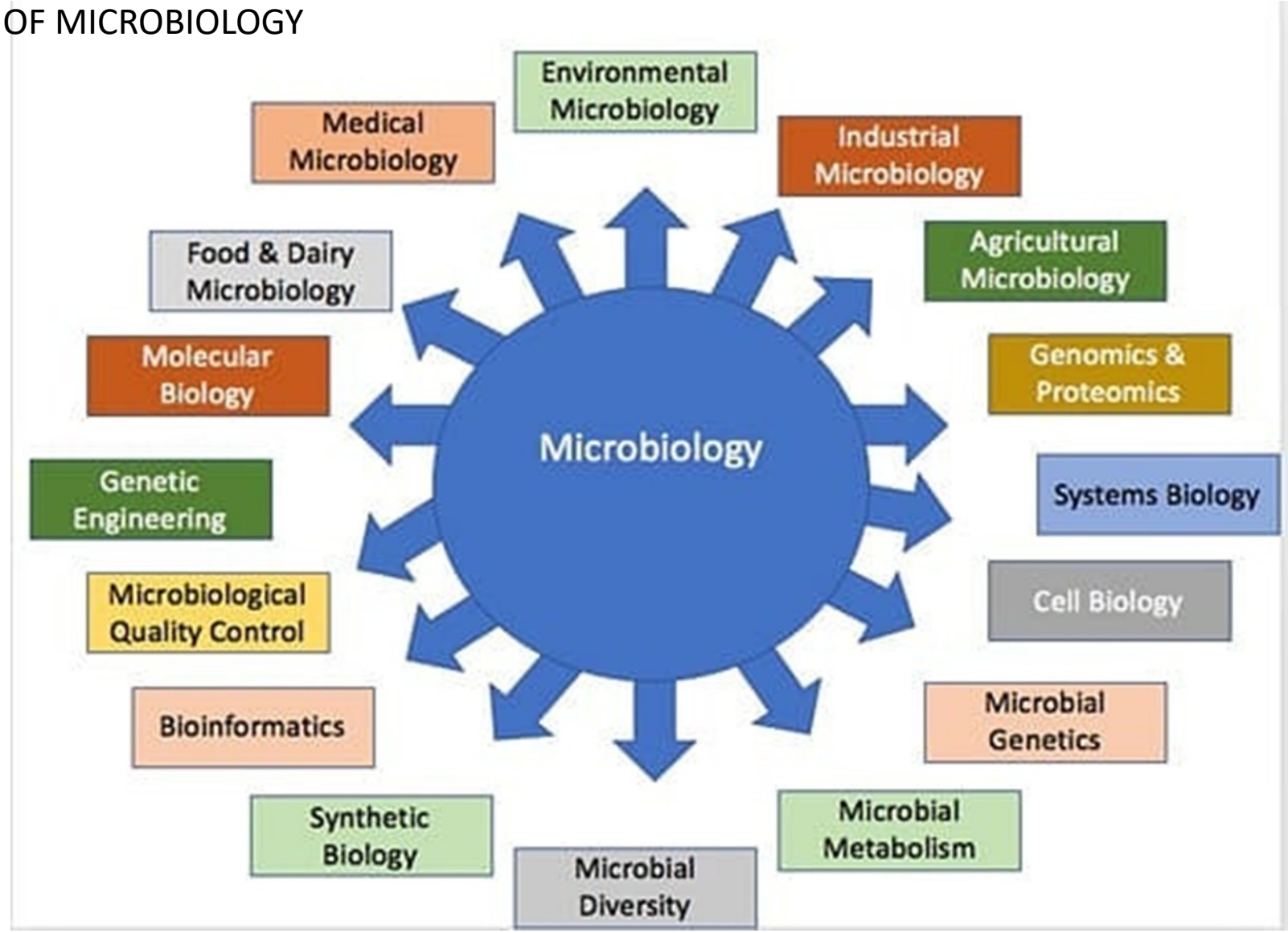
B



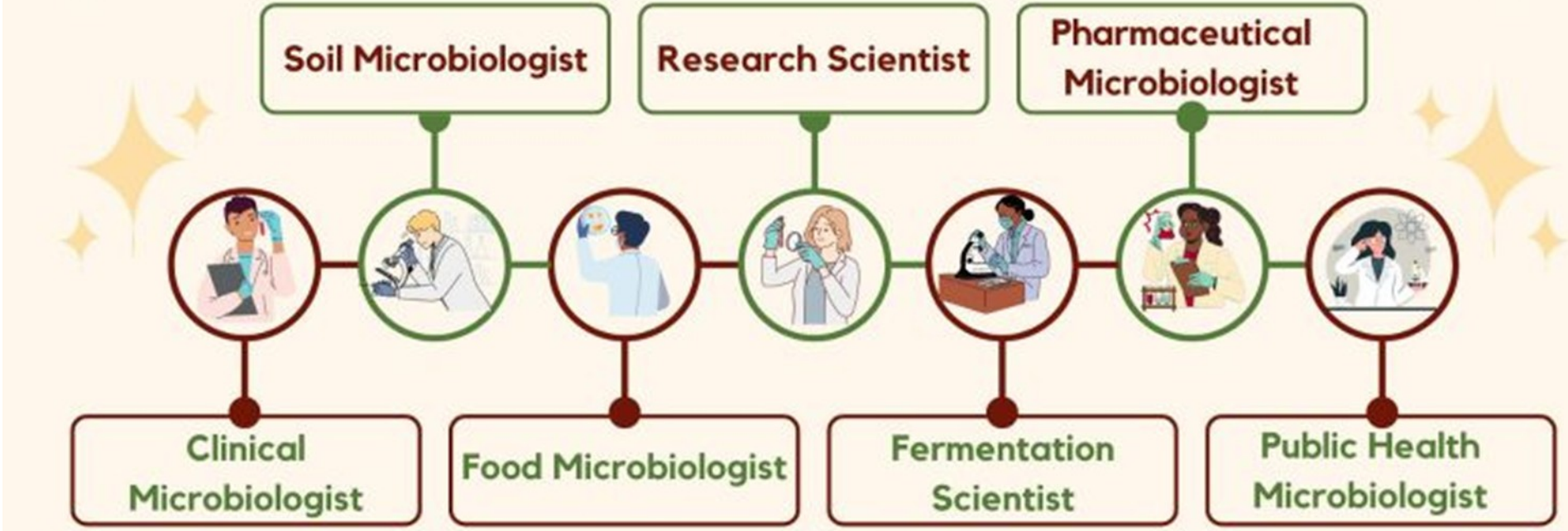
PASTEURIZATION



BRANCHES OF MICROBIOLOGY



Career Scope of Microbiology

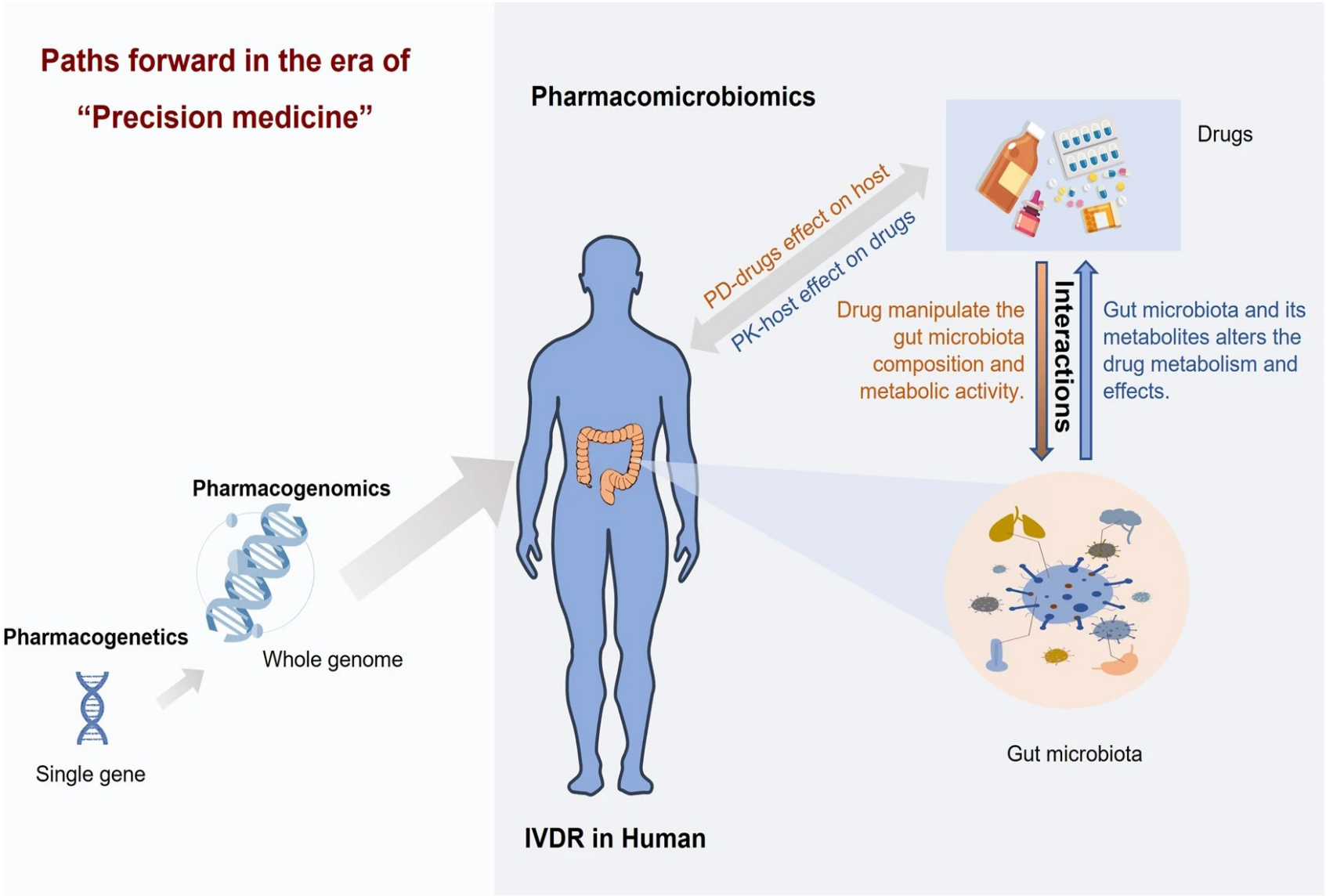


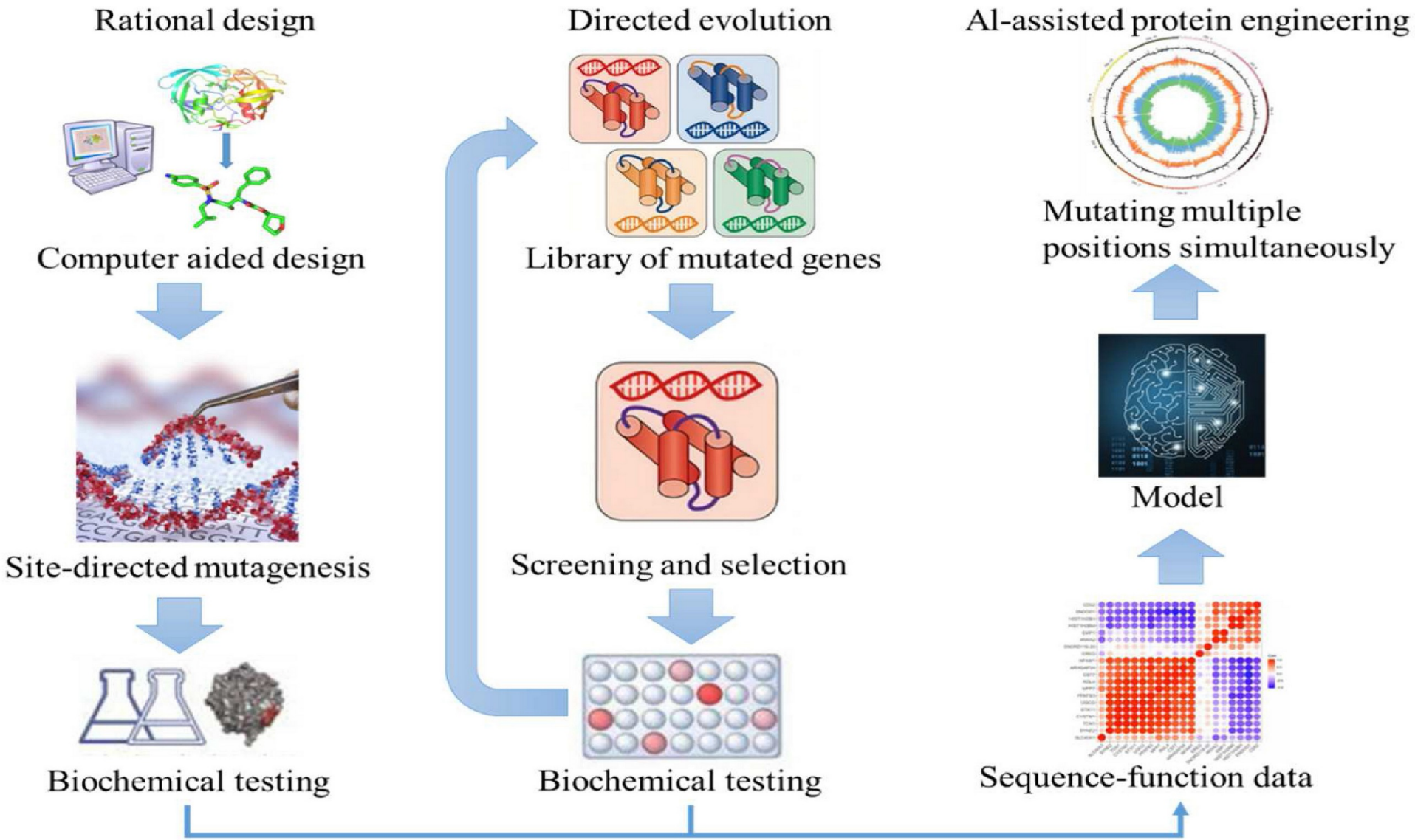
Pharmaceutical Microbiology

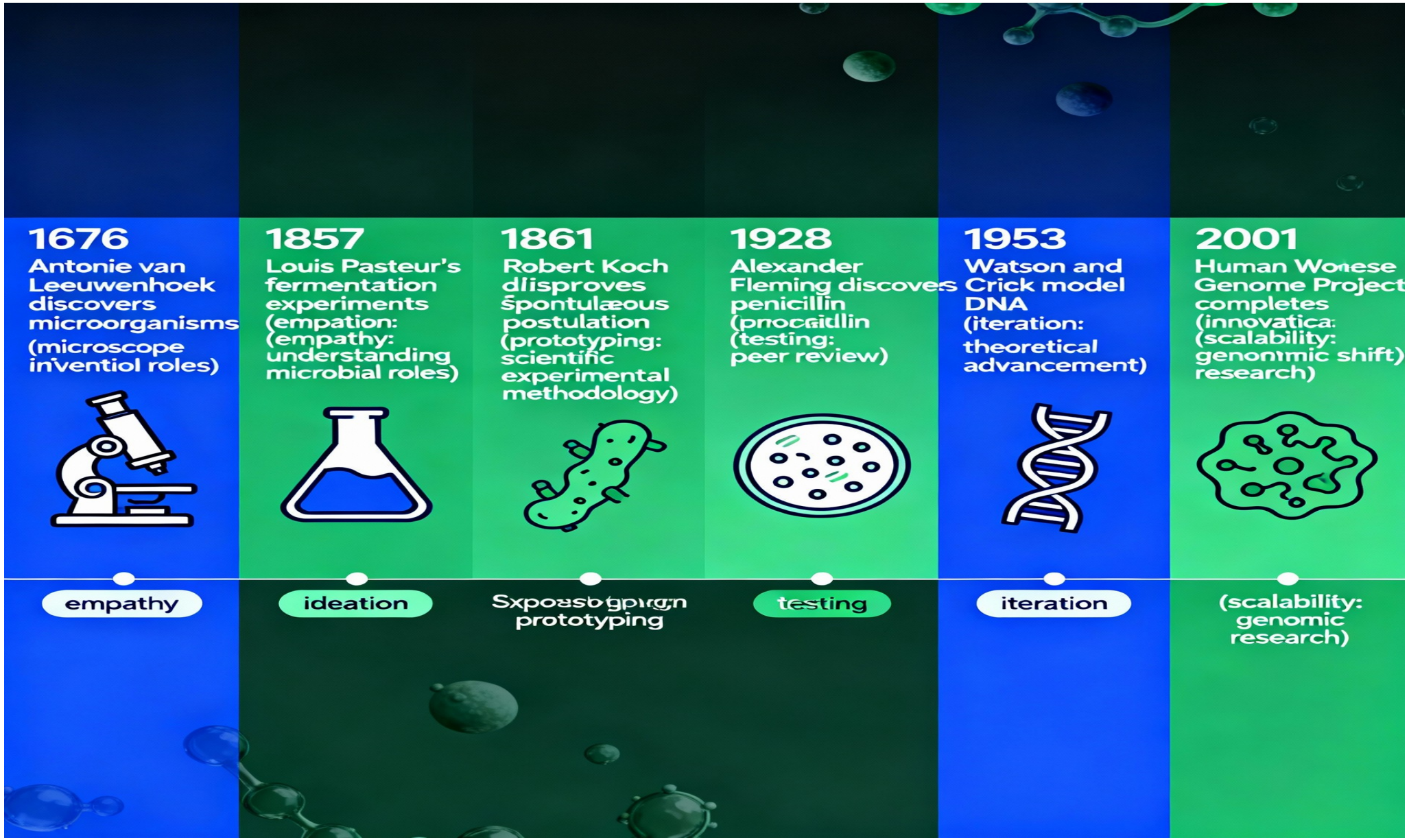
- is a specialized branch of microbiology that plays a pivotal role in ensuring the safety and efficacy of pharmaceutical products.



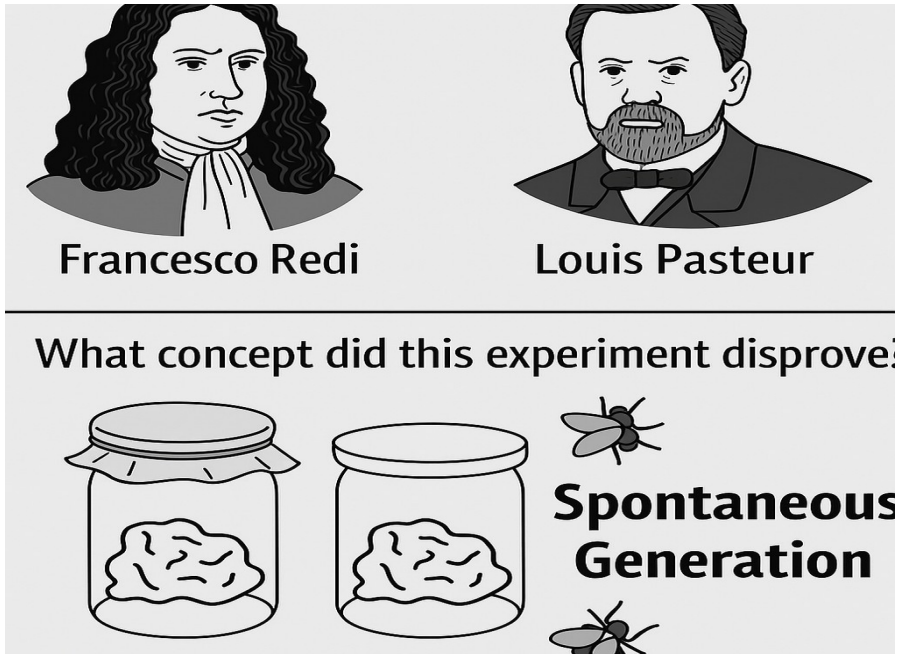
Paths forward in the era of "Precision medicine"

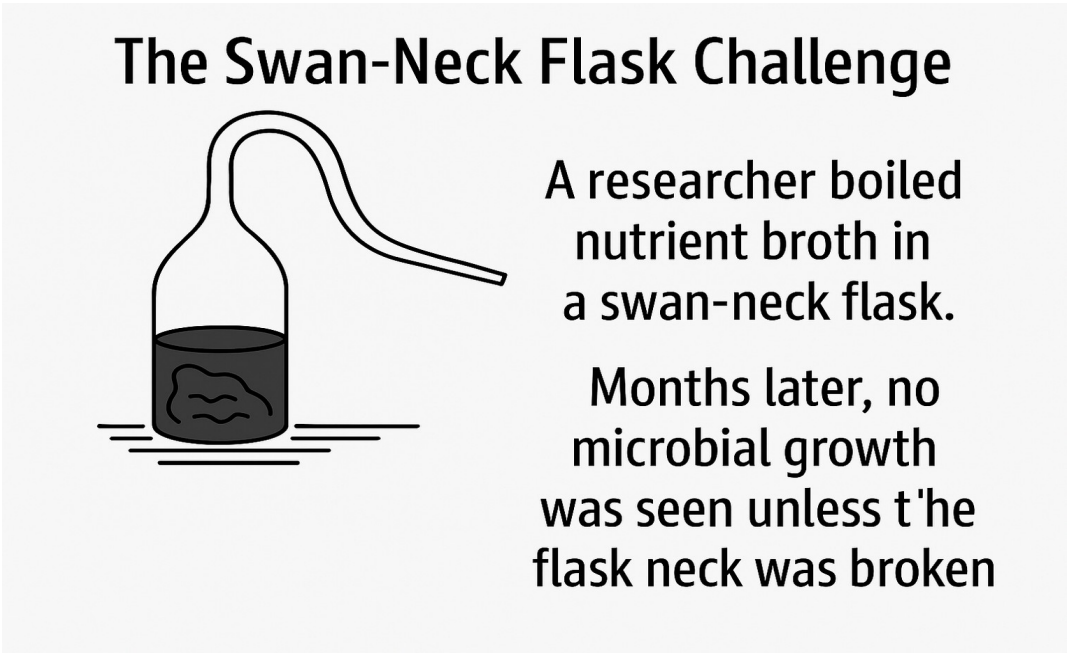





1676
Antonie van Leeuwenhoek discovers microorganisms (microscope inventiol roles)
1857
Louis Pasteur's fermentation experiments (empation: (empathy: understanding microbial roles)
1861
Robert Koch dlisproves spontulæous postulation (prototyping: scientific experimental methodology)
1928
Alexander Fleming discoves penicillin (procaidlin (testing: peer review)
1953
Watson and Crick model DNA (iteration: theoretical advancement)
2001
Human Wonese Genome Project completes (innovatica: (scalability: genonimic shift) research)
empathy
ideation
Sxpoasbgpiagn prototyping
testing
iteration
(scalability: genomic research)

Assessment :


Francesco Redi
Louis Pasteur
What concept did this experiment disprove?
Spontaneous Generation


The Swan-Neck Flask Challenge
A researcher boiled nutrient broth in a swan-neck flask.
Months later, no microbial growth was seen unless t'he flask neck was broken

Assessment :

The Cowpox Secret

A country doctor noticed milkmaids who had cowpox didn't catch smallpox.
He inoculated a boy with cowpox material, protecting him

The Silk Worm Saver

A disease was devastating the silk industry.
A scientist discovered that microorganisms were responsible for silkworm disease.

REFERENCES:

1.W.B. Hugo and A.D. Russel: Pharmaceutical Microbiology, Blackwell Scientific publications, Oxford London.

2. Prescott and Dunn., Industrial Microbiology, 4th edition, CBS Publishers & Distributors, Delhi.

3. Ananthanarayan : Text Book of Microbiology, Orient-Longman, Chennai