Ministry of Higher Education
and Scientific Research
University of Ishik
College of education
Department of Biology

Practical Microbiology
2018- 2019 (3rd Grade)
Lab. 3

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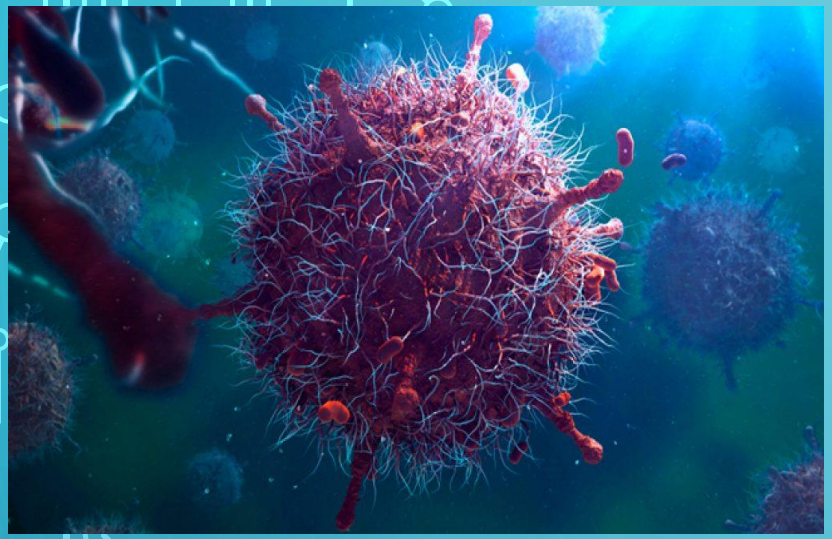
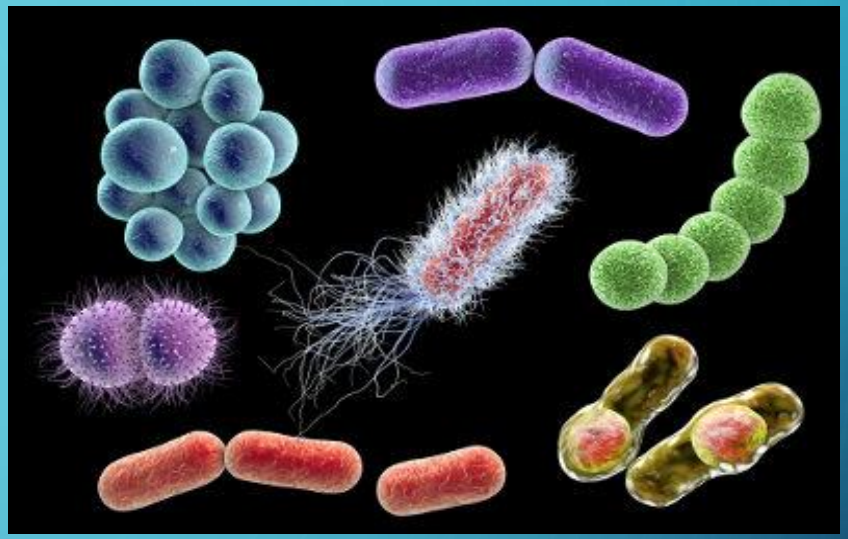
BASIC GROUPS OF MICROBES

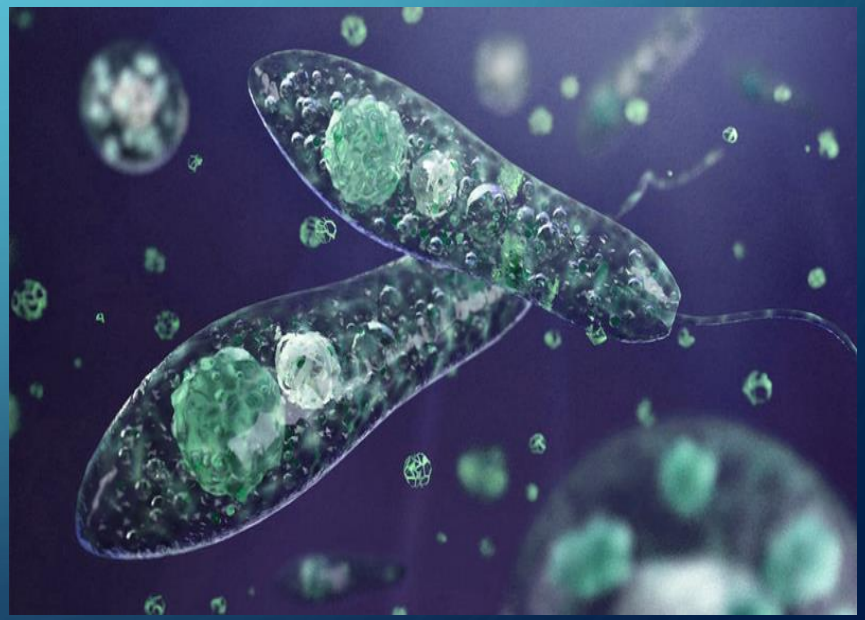


VIRUS



MONERA

FUNGI



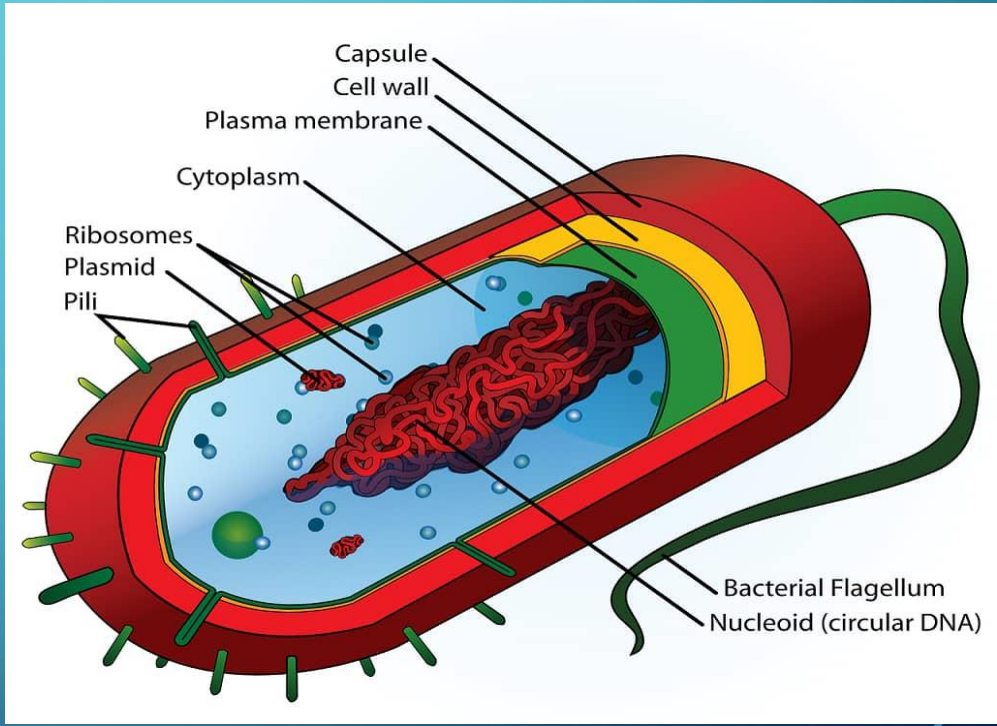
PROTISTA

WHAT ARE BACTERIA ???

- Bacteria are living organisms (single cell organism)
- They are so small you need a microscope to see them
- They come in different sizes and shapes
- They can be found in everywhere

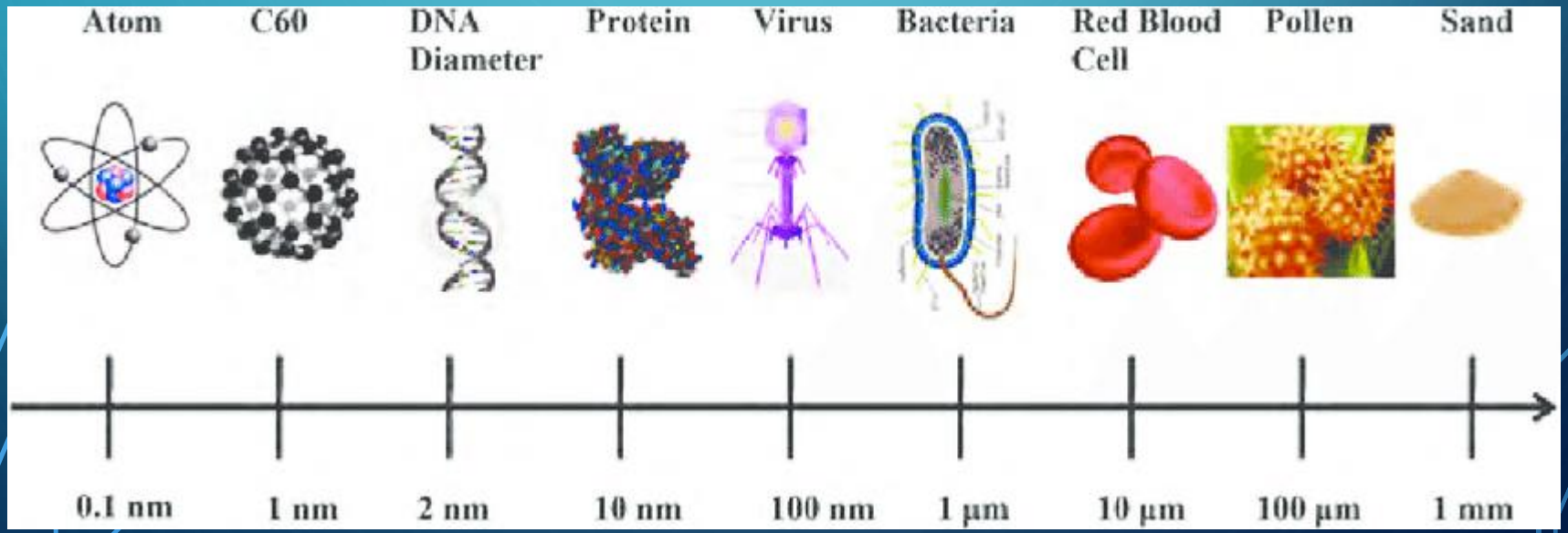
STRUCTURE OF BACTERIA

- Cell wall (peptidoglycan)
- Cell membrane
- Cytoplasm
- Nuclear membrane
- *Plasmid
- *Capsule
- *Flagella
- *Pilli
- *Spore



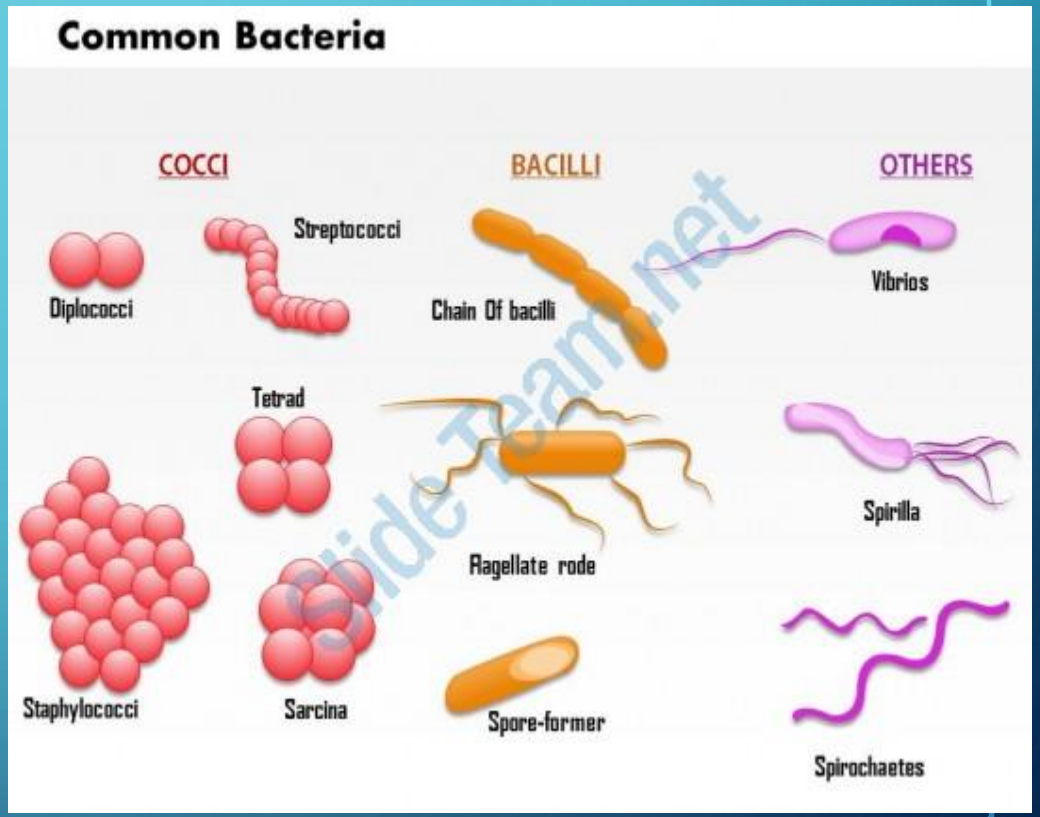
SIZE OF BACTERIA

Bacterial cells are very small - about 10 times smaller than most plant and animal cells. Most bacterial cells range in size from **0.2** to **10** microns or micrometers (0.0000079 to 0.00039 inches)



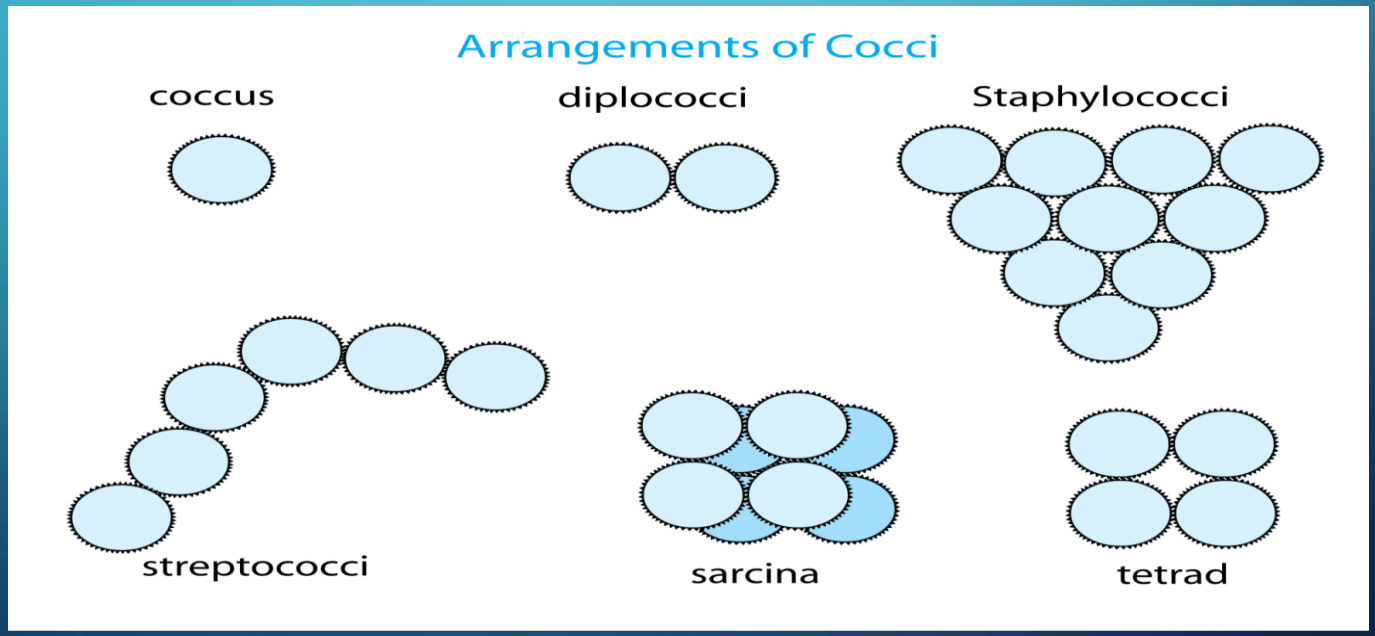
SHAPES OF BACTERIA

- Cocci
- Bacilli
- Vibrios
- Spirilla
- Spirochetes
- Actinomycetes
- Mycoplasma



ARRANGEMENTS OF BACTERIAL CELLS

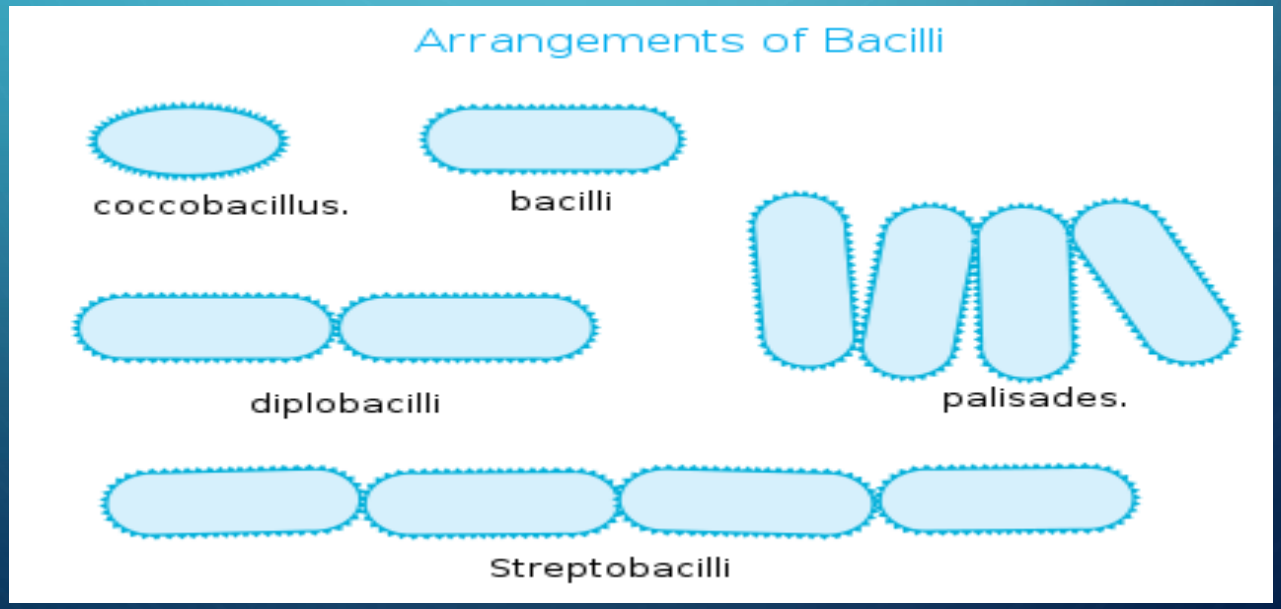
Cocci may occur in pairs (diplococci or pneumococci),in four (tetrad) ,clusters (Staphylococci), in chain (Streptococci)



BACILLUS

The second shape is **bacillus**, plural **bacilli**. These bacteria are shaped like small rods, longer than they are wide. A bacillus cell looks a lot like a pill.

some bacilli bacteria have round ends, while others are square.



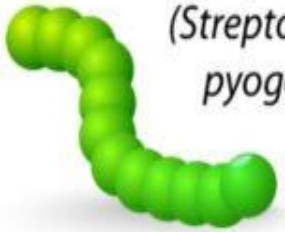
COCCI

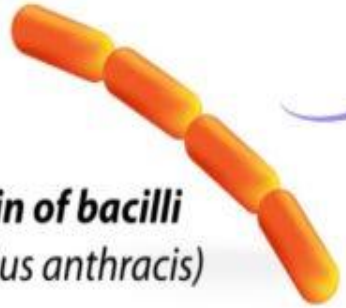
BACILLI

OTHERS

Diplococci
(Streptococcus pneumoniae)

Streptococci
(Streptococcus pyogenes)

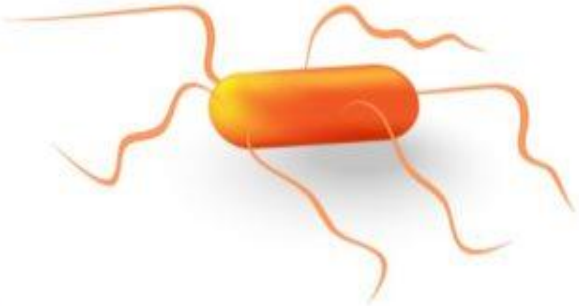




Chain of bacilli
(Bacillus anthracis)

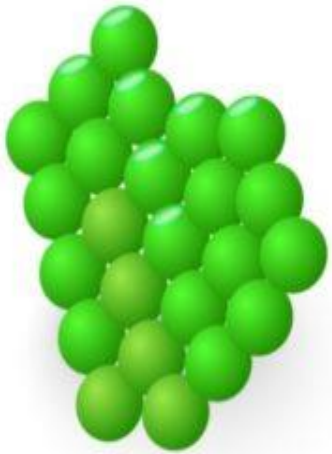
Vibrios
(Vibrio cholerae)

Tetrad



Flagellate rods
(Salmonella typhi)

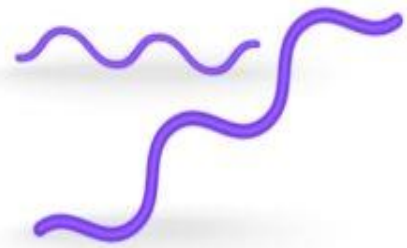
Spirilla
(Helicobacter pylori)



Staphylococci
(Staphylococcus aureus)

Sarcina
(Sarcina ventriculi)

Spore-former
(Clostridium botulinum)



Spirochaetes
(Treponema pallidum)

Bacterial metabolism

Nutritional type	Source of energy	Source of carbon
phototrophs	sunlight	Organic compounds (photoheterotrophs) Carbon fixation (photoautotrophs)
Lithotroph	Inorganic compounds	Organic compound(lithoheterotrophs) Carbon fixation (lithoautotrophs)
Organotroph	Organic compounds	Organic compound (chemoheterotroph) Carbon fixation (chemoautotrophs)

ANY QUESTIONS ??????