

Mid-Term Assignment (Summer-2020)
Course Title: Medical Microbiology
(BS. DT)
Instructor: Pashmina

Time: 4 hours (9-1)

Max Marks: 30

Q1. Illustrate what are the difference between Prokaryotes and Eukaryotes?

Q2. What do you know about the Normal Flora? Write-down its Advantages and Disadvantages?

Q3. Differentiate between

- Archae and Bacteria
- Endotoxin And Exotoxin
- Protozoa and Fungi
- Host and Parasite
- Plant cell and Animal cell

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paper medical microbiology

submitted to mem pashmina

(Q1)

Prokaryotic cell features

Here is a breakdown of what you might find in a prokaryotic bacterial cell.

Nucleoid: A central region of the cell that contains its DNA.

Ribosome: Ribosomes are responsible for protein synthesis.

Cell wall: The cell wall provides structure and protection from the outside environment. Most bacteria have a rigid cell wall made from carbohydrates and proteins called peptidoglycans.

Cell membrane: Every prokaryote has a cell membrane, also known as the plasma membrane, that separates the cell from the outside environment.

Capsule: Some bacteria have a layer of carbohydrates that surrounds the cell wall called the capsule. The capsule helps the bacterium attach to surfaces.

Fimbriae: Fimbriae are thin, hair-like structures that help with cellular attachment.

Pili: Pili are rod-shaped structures involved in multiple roles, including attachment and DNA transfer.

Flagella: Flagella are thin, tail-like structures that assist in movement.

(2) Eukaryotic cell features

Within a eukaryotic cell, each membrane-bound structure carries out specific cellular functions. Here is an overview of many of the primary components of eukaryotic cells.

Nucleus: The nucleus stores the genetic information in chromatin form.

Nucleolus: Found inside of the nucleus, the nucleolus is the part of eukaryotic cells where ribosomal RNA is produced.

Plasma membrane: The plasma membrane is a phospholipid bilayer that surrounds the entire cell and encompasses the organelles within.

Cytoskeleton or cell wall: The cytoskeleton or cell wall provides structure, allows for cell movement, and plays a role in cell division.

Ribosomes: Ribosomes are responsible for protein synthesis.

Mitochondria: Mitochondria, also known as the powerhouses of the cell, are responsible for energy production.

Cytoplasm: The cytoplasm is the region of the cell between the nuclear envelope and plasma membrane.

Cytosol: Cytosol is a gel-like substance within the cell that contains the organelles.

Endoplasmic reticulum: The endoplasmic reticulum is an organelle dedicated to protein maturation and transportation.

Vesicles and vacuoles: Vesicles and vacuoles are membrane-bound sacs involved in transportation and storage.

(Q2) About normal Flora:

Normal flora are the microorganisms that live on another living organism (human or animal) or inanimate object without causing disease. The human body is not sterile; we become colonised by bacteria from the moment we are born.

We are covered with, and contain within our intestines, approximately one hundred trillion bacteria that form the normal flora of our bodies. This normal flora helps to prevent us becoming colonised with more dangerous bacteria, which might lead to infection.

Many circumstances can change normal flora, e.g. normal flora of the human body begins to change after admission to a

hospital or long-term care facility. The process usually begins around day 4 of admission; this is why after 4 days of admission the antibiotics for hospital acquired infections change. It is not because the severity of the illness is different.

(Advantage)

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without causing disease. The human body is not sterile; we become colonised by bacteria from the moment we are born. We are covered with, and contain within our intestines, approximately one hundred trillion bacteria that form the normal flora of our bodies. This normal flora helps to prevent us becoming colonised with more dangerous bacteria, which might lead to infection.

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Disadvantage

It has both advantages as well as disadvantages. (i) They prevent or suppress the entry of the pathogens .

. (iv) Colonies produced by some organisms of normal flora have a harmful effect on the pathogens.

(v) Endotoxins liberated by normal flora may help the defense mechanism of the body.....

(Q3) DIFFERENT B/W PARASITE AND HOST

Difference Between Parasite and Host

Definition

Parasite: Parasite is an organism that lives on the surface or inside another organism and feeds on it.

Host: Host is an organism that serves as a source of food and habitat to a parasite.

Types

Parasite: According to their localization parasites are endoparasites or ectoparasites; according to their ontogenesis and way of life, parasites are obligate, facultative or pseudoparasites; according to the time span of the parasitism, the parasites are temporary, permanent or transit.

Host: Depending on their role in the development and existence of the parasites, hosts can be divided into obligate, paratenic, and potential; depending on the

stage of development of the parasite, obligate hosts are divided into end, intermediate, and additional host; depending on the development of the parasite within the paratenic host, they are divided into euparatenic, paraparatenic, and metaparatenic hosts.

Impact

Parasite: The parasite benefits from the host, using it as a source of food and habitat.

Host: Parasites have a negative effect on the survival and the physical condition of the hosts. In some cases, parasites can cause the death of the hosts.

Influencing factors

Parasite: The factors that determine the course of the parasitosis are the pathogenicity, species characteristics, adaptations, quantity, reproductive potential, localization of the parasites, etc.

Host: The factors that determine the course of the parasitosis are the condition of the immune system, protective reflexes, immunopathological reactions, hosts' nutrition, concomitant diseases, etc. If the host is human important factors are the lifestyle, culture, level of health care, etc.

(2) Endotoxin and Exotoxin

Top Articles on Microbiology Info

S.N. Exotoxins Endotoxins

1

Excreted by organisms, living cell

Integral part of cell wall

2

Found in both Gram positive and Gram
Negative bacteria Found mostly in Gram
Negative Bacteria

3

It is polypeptide It is lipopolysaccharide
complex.

4

Relatively unstable, heat labile (60°C)

Relatively stable, heat tolerant

5

Highly antigenic Weakly immunogenic

6

Toxoids can be made by treating with formalin Toxoids cannot be made

7

Highly toxic, fatal in μg quantities
Moderately toxic

8

Usually binds to specific receptors
Specific receptors not found

9

Not pyrogenic usually, Toxin Specific
Fever by induction of interleukin 1 (IL-1)
production, Shock

10

Located on extrachromosomal genes (e.g. plasmids) Located on chromosomal

genes

11

Filterable Not so

12

It has mostly enzymatic activity It has no enzymatic activity

13

Its molecular weight is 10KDa Its molecular weight is 50-1000KDa

14

On boiling it get denatured. On boiling it cannot be denatured.

15

Detected by many tests (neutralization, precipitation, etc) Detected by Limulus lysate assay

16

Examples: Toxins produced by Staphylococcus aureus, Bacillus cereus, Streptococcus pyogenes, Bacillus anthracis(Alpha-toxin, also known as alpha-hemolysin (Hla)) Examples: Toxins produced by E.coli, Salmonella Typhi, Shigella, Vibrio cholera(Cholera toxin-also known as cholera toxin)

17

Diseases: Tetanus, diphtheria, botulism
Diseases: Meningococemia, sepsis by gram negative rods.

(FUNGI)

What are Fungi?

Fungi belong to the group of Eukaryotes which includes different types of species. Common types of fungi are yeasts, mold, and mushrooms. The kingdom fungi could be classified into five true phyla namely, Chytridiomycota, Zygomycota, Ascomycota, Basidiomycota and the recently described Phylum Glomeromycota. The characteristic feature that distinguishes fungi from other plants, some protists and bacteria is their presence of chitinous cell walls. Fungi are heterotrophic which make them similar to animals. They secrete different types of digestive enzymes on organic matter to absorb food by decomposing them.

(Protozoa)

What are Protozoa?

Protozoa are considered to be single-celled organisms which are eukaryotes that possess cell nuclei. They also share common characteristics with animals. Common characteristics include locomotion and heterotrophy. Protozoa are abundantly present in environments that possess high levels of moisture (aqueous environments) and soil in which they occupy different stages of trophic levels. Protozoa accomplish their movement through the presence of cilia and flagella or amoebic movement through pseudopodia. The protozoan that possesses flagella is referred to as flagellates. They may possess a single flagellum or multiple flagella. Ciliates move due to the presence of hair-like cilia.

According to the pattern of the beating of cilia, these protozoa can alter their direction of the route. Protozoa such as Amoeba

accomplish locomotion through pseudopodia. Some protozoa are stationary and they do not move. These types of protozoa are referred to as sessile organisms.

(4) plant cell

1 plant generally are rooted in one place and do not move on their own.

2 plant contain chlorophyll and can make their food.

3 plant give off oxygen and take carbon dioxide given by animals.

4 plant cell have cell wall and other structures differ from other animals.

5 plant are autotrophic.

animal cell

1 most animal have the ability to move faidy freely.

2 animals can not make their food and are dependent on plant and their animals for food.

3 animals give carbon dioxide which plant need to make in oxygen which they need to breath.

4 animals have a much more highly developed sensory and nervous system.

5 animals are hetrotropic.

(5) ARCHAEA AND BACTERIA.

1 Archea cell type (prokaryotic

2 cell wall (no peptidoglycan.

3 membran lipid (ether linked.

4 first amino acids in all proteins (methionine.

5 Antibiotics sensitivity (no.

6 DNA organization (circular with histone.

7 know for extreme environment(none infected human.

2(BACTERIA)

1 BACTERIA cell type are (prokaryotic

2 cell wall (can peptidoglycan

3 membrane lipid(Esther linked

4 first amino acids in all proteins(for mylmethionine

5 Antibiotics sensitivity (yes

6 DNA organization (circular

7 know for extreme (Both heplful and harmful relationship with humans.

END THE PAPER

THANK YOU MAM