**Medical Microbiology. Dental 4th semester.**

**Mid-term assignment paper.**

**INSTRUCTOR . Muhammad Sohail**

**STUDENT NAME: zulqarnain bacha**

**ID NO : 14497**

*Instruction; Write briefly and up to the point. All questions carry equal marks.*

1. Explain Structure of bacteria in detail ? also Explain some cell organelle of bacterial cell and its function
2. What is Bacterial culture media ? write down some types of bacterial culture media in detail.?
3. What is the difference between Sterilization and disinfection ? write down some methods used for sterilization ?
4. Write a note on Structure of fungi in detail ?
5. What are few Hospital based infections that can be transfer to others due to un hygienic condition ? Explain with an example ?

**(1) Answer** : Bacteria is a prokaryotic cell which consists of only one cell ,therefore called unicellular microorganism.

A bacterial cell remains surrounded by an outer layer or cell envelope, which consists of two components:

* A rigid cell wall
* A cytoplasmic membrane or plasma membrane.

The cell envelope in some bacteria may be enclosed in a loose slimy layer or capsule.

Some bacteria also carry flagella.

Fine hair-like fimbriae or pili are also present in some bacteria.

Bacterial cell wall is extremely thin (10-25 nm thick) and provides rigidity and a definite shape to the cell.

Cytoplasmic membrane is a thin (5-10 nm) layer lining the inner surface of the cell wall. It separates the cell wall from the cytoplasm.

Cytoplasm is present in the form of a colloidal system of several organic and inorganic solutes in a viscous watery solution.

Membrane-bound organelles, such as endoplasmic reticulum, mitochondria and Golgi- bodies are also absent in bacteria.

The bacterial cytoplasm contains several ribosomes which occupy the most part of the cytoplasm.These are the centres of protein synthesis. Ribosomes are the ribonucleoprotein particles of approximately 100 Å in diameter.

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Intracytoplasmic inclusions are volutin, polysaccharide, lipid, crystals and vacuoles.

Nuclear material is present in each bacterial cell, but there is no nuclear membrane or nucleolus. Bacteria are, therefore, prokaryotic.

Some bacteria possess some extranucelar genetic elements made up of DNA. These cytoplasmic carriers of genetic information are called ‘plasmids’ and ‘episomes’.

Flagella are long, fine, hair-like, locomotory appendages, found commonly in rod-shaped and spiral bacteria.

Some very fine, hair-like, surface appendages, found in some Gram-negative bacilli are called fimbriae.

**Some Bacterial cell organelles and its functions:**

|  |  |
| --- | --- |
| **Cell organelle** | **Function** |
| Flagella | Swimming movement |
| Ribosomes | Sites of translation (protein synthesis) |
| Inclusions | Often reserves of nutrients; additional specialized functions |
| Chromosome | Genetic material of cell |
| Plasmid | Extrachromosomal genetic material |



**(2) Answer** : **Bacterial Cultural Media**:

Bacterial Cultural Media is the environment in which all the requirements of bacteria is available for the growth of bacteria.

Media: Either can be liquid or solid.

**SOME BACTERIAL CULTURAL MEDIA**:

**1 Basal Media:**

It is basic media.

Pre-made

No further addition

E.g : Nutrient agar media broth media(liquid media).

**2: Enriched Media:**

Means make further rich.

Add further components.

Additives are blood,egg,serum.

Blood agar media , streptococci grows on heamolysis.

**3: Selective Media:**

Favouring a particular microorganisms.

Discourage the non-required microorganisms.

Lj media(Lewenstein Janson)

**4: Indicative Media:**

We use it for identification of bacteria.

Specific chemicals are added.

Microorganisms reacts and give identification

E.g MC Konky agar Media.

**5: Transport Media:**

We use it when we transport bacteria from one place to another.

Adding nutrients for bacterial survival.

Pepton water ( sugar, alcohol).

**6: Storage Media:**

We use it when we store bacteria for some time.

Egg saline media..

**(3) Answer** : **Disinfection**

* We use chemicals in this process
* Use for all instruments
* Kill the microorganisms without spores
* It is not more effective

**Sterilization**

* Not use chemicals work through heat
* Use only for those which stay against heat
* Kill all the microorganisms
* It is more effective

**Some Method use for sterilization** :

**1: Physical** > Heat> either dry or Moist.

Dry heat: in oven/ fire then sterilized

Moist heat: on Boiling then disinfect

**2: Chemical**: > Gases > oxide ( H2O2)

> Liquid> alcohol

**3:Mechanical**: Through filtration it filter upto 0.1mm

**4: Biological**: Viron/prion ,we start predator

**(4)Answer** : The main body of most fungi is made up of fine, branching, usually colourless threads called hyphae. Each fungus will have vast numbers of these hyphae, all intertwining to make up a tangled web called the mycelium.

The mycelium is generally too fine to be seen by the naked eye, except where the hyphae are very closely packed together. The picture on the left was taken through a microscope. The hyphae are magnified 100 times life size



Some fungi, such as Honey Fungus, which is a parasite of woodland trees, have hyphae collected together into long cables, called rhizomorphs. Because there are so many hyphae packed together, they are easily seen, forming black 'bootlaces'. These can spread through a woodland infecting neighboring trees.



Fungal mycelium is mostly hidden from human view, not only because of its small size, but also as a result of its location. The tangled mycelial mass is usually hidden deep within its food sources, such as rotting matter in the soil, leaf litter, rotting wood, or dead animals. The mycelium remains undetected until it develops one or more fruiting bodies, containing the reproductive spores.



They are usually produced at the surface of the food source, rather than hidden within it, to allow the spores to be shed and carried away by the wind, or by water, or animals. The fruiting bodies are usually the only indication we have that a fungus is present. Like icebergs, they represent a tiny fraction of the whole fungus, with most of it being hidden from view