**IQRA NATIONAL UNIVERSITY**

**DEPARTMENT OF ALLIED HEALTH SCIENCES**

**Final-Term Examination 2020**

**Course Title: Medical microbiology DT 4th Instructor: Muhammad Sohail**

**Time: 6 hours Total Marks: 50**

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Q1. What do you know about parasites explain endo and ecto parasites in details

Ans: **Parasites:**

A parasites are an organism that lives on or in a host and gets its food from or at the expense of its host. Parasites can cause disease in humans.

Parasites vary widely. Around 70 percent are not visible to the human eye, such as the malarial parasite, but some worm parasites can reach over 30 meters in length.

Parasites are not a disease, but they can spread diseases. Different parasites have different effects.

E.g. Bacteria, Virus, fungi, protozoa’s and helminths.

The study of parasites is called parasitology.

Parasites can be carnivorous if living with animals or herbivorous if living with plants.

Endoparasites and ectoparasotes:

**Ectoparasites**:

Ectos is a Greek word means "outside"

Ectoparasites are invertebrates that live on the surface of the human body, such as head lice, body lice and ticks. Their bites can cause intense irritation and they also transmit some potentially life-threatening pathogens to humans, such as the bacteria that cause typhus

These are the parasites which live on the outside of host. For example, human body lice.

**Endoparasites**:

Endon is a Greek word means "within".

These are the parasites which live in the digestive tract, body cavities, various organs, or blood or other tissues of the host. For example, Plasmodium.

The endoparasites of humans belong to four types of worms: a

roundworms

tapeworms

filarial (thread) worms

flukes (or flatworms).

Q2. Explain protozoa, its characteristics and morphology, also classify protozoa on the basis of motility and reproduction into its types

Ans: **Protozoa:**

The word protozoa is come from Greek word "protozoon" meaning " First animal".

Protozoa are unicellular or may be multicellular Eukaryotic microorganism.

Protozoa comprised of large group about 65,000 species. Most of which are harmless free living and inhabits water and soil.

A few species are pathogenic in nature which caused hundreds of millions of infection in humans and animals.

**Characteristics**:

1.They are small, usually microscopic, not visualize without a microscope.

2.They are the simplest and primitive of all animals.

3.Mostly unicellular organism with fully functional cell.

4. Live freely, may be parasite or like symbiotic.

5.Protozoa are chemo-heterotrophs

6.They are motile have locomotive organelles.

e.g: Flagella and Cilia for movement.

7.Body shape variables may be spherical, oval, elongated or flattened.

**Morphology:**

Protozoans are single-celled eukaryotes.

They are small organisms, ranging from a few microns in length up to about 1 mm.

Basic body structure consists of an external plasma membrane which encloses the cytoplasm and nucleus.

Cytoplasm is divided into an outer layer ectoplasm and inner layer endoplasm.

Ectoplasm helps in movement, feeding and protection.

Endoplasm houses nucleus, mitochondria and food.

Cell organelles:

There may be one or more nuclei, the nuclei are of two types: larger macronuclei and smaller micronuclei.

Vacuoles containing food material in various states of digestion may be present, and mitochondria are occasionally large enough to be seen.

Locomotory organelles:

Flagella

Cilia

Pseudopodia; temporary extension of cytoplasm.

**Classification of protozoa on the basis of motility and reproduction:**

Classified into four main types.

1. Flagellates

2. Ciliates

3. Sarcodina

4. Sporozoates

Q3. Write down names of organelles and its functions present in paramecium and euglena

Ans: **Paramecium**

|  |  |
| --- | --- |
| Cell organelles | Function |
| Cytoplasm | Support the internal structure and shape and consistency of the cell |
| Cilia | Movement, food intake receptors |
| Micronucleus | Reproduction |
| Macronucleus | Non-reproductive cell functions e.g metabolism |
| Contractile vacuole | Expells excess liquid on contraction |
| Oral groove | Food intake through cillia |
| Food vacuole  Anal pore | Digests the food  Feces secretion |

EUGLENA

|  |  |
| --- | --- |
| Cell organelles | Function |
| Cytoplasm | Support the internal structure and shape and consistency of the cell |
| Nucleolus | Contributes to ribosomes synthesis |
| Flagellum | Movement |
| Contractile vacuole | Expels excess water |
| Photoreceptor | Light-sensitive protein involved in the sensing and response to light |
| Stigma | Allows the cell to sense light direction and intensity and respond to it |
| Chloroplast | Photosynthesis |
| Nucleus | Contains the genetic material, brain of the cell |

Q4. What is antibiotic resistance? Explain the mechanism of bacterial resistance. Its causes and solutions to the problem

Ans:

**Antibiotic Resistance:**

Antibiotic resistance occurs when an antibiotic has lost its ability to effectively control or kill bacterial growth, in other words the bacteria are "resistant" and continue to multiply in the presence of therapeutic levels of an antibiotic.

Mechanism of antibiotic Resistance

Denied access: Antibiotics wants to pass the bacterial cell membrane but membrane becomes impermeable for antibiotic: e.g. Imipenem

Antibiotic modification: In second step antibiotic becomes modified by the help of bacterial enzyme. e.g beta lactase inactivates penicillin

Altered target site: antibiotic cannot bind to its intended target because the target itself has been modified

Pumping out: The antibiotic faster than it gets in: tetracycline

Alternative target: Alternative penicillin binding protein in MRSA.

Over prescription of antibiotics

1. Physicians prescribe medicine without detecting the pathogen.

2. Prescribe broad spectrum antibiotics when narrow spectrum is actually needed.

Patient Non-Compliance

1. Anti are prescribed in a specific dose regiment.

2. Patients forget to take medicine on right time.

3. Unable to afford full coarse.

Over dose of antibiotics

1. Antibiotics taken as OTC drug.

2. Retail drug store presents a chaotic situation during drug distribution.

3. Patients demand for antibiotics for normal cold,fever.

Use of Antibiotics on domestic animals

1. A good chance for antibiotics to develop resistance.

2. Spreading of resistance microbes through water and food.

Poor hygiene and sanitation

1. In some areas waste water from hospital are poorly filtered which allows resistance bacteria to escape.

2. The bacteria spreads when people drink this water.

Solution to this Resistance

* Only use antibiotics when prescribed by a certified health professional.
* Never demand antibiotics if your health worker says you don't need them.
* Never use left-over antibiotics.
* Never share antibiotics with others.
* Make information available on the impact of antibiotic resistance.

Q5. Explain the mechanism of bacterial pathogenicity. Write down at least two bacterial diseases in detail.

Ans: **Mechanism of Bacterial Pathogenicity:**

1. **Invasiveness**: the ability to invade tissue.

* Encompasses mechanism for
* Colonization (adherence and initial multiplication)
* Production of extracellular substance which facilitate invasion
* Ability to bypass or overcome host defense mechanism.

2. **Toxigenesis** : ability to produce toxins.

- Bacteria may produce to type of toxins.

I. Exotoxin

Exotoxin are release from bacterial cell and may act at tissue site removed from the site of Bacterial growth.

II. Endotoxin

* Endotoxin are cell associated substance.
* Endotoxin may be released from growing bacterial cell and that are lysed as a result of effective host defense (e.g. lysosomes) or the activities of certain antibiotics (e.gpenicillin and cephalosporin)
* Hence bacterial toxins both soluble and cell associated may bebe transported by blood in lymph and cause cytotoxic effect at tissue site.
* Some bacterial toxins may act at the site colonization and play a role in invasion.

Two bacterial diseases:

**1. Meningitis**

Meningitis is the information of the lining around the brain and spinal cord.

It is usually caused by an infection.

Sings:

Severe headache

Dislike of bright light

Fever

Vomiting

Stiff neck

Rapid beat

Drowsy and less responsive

Stomach, joint, muscle pain

Rash

Skin very pale, blue or dusky around lips

Severe leg pain

Cold hands or feet with high temperature

Types of meningitis:

Viral

It is fairly common

It usually doesn't cause serious illness.

In severe cases, it can cause prolonged fever and seizures.

Bacterial

It is not as common

But it's very serious

It needs to be treated right away to prevent brain damage and death.

**2 pharyngitis**

It is information of the pharynx (the back of the throat)

This can cause as sore throat, as well as scratchiness in the throat and difficulty swallowing.

Symptoms

Body aches

Coughing up clear, yellow, light brown, or green mucus

Difficulty breathing

Difficulty swallowing

Dry throat

Enlarged lymph nodes

Fever and chill

Throat pain

**Causes**

Viral infection such as influenza

Bacterial infection such as strept throat.