**IQRA NATIONAL UNIVERSITY**

**DEPARTMENT OF ALLIED HEALTH SCIENCES**

**Final-Term Examination 2020**

**Course Title: ,Medical microbiologyDT 4th Instructor: Muhammad sohail**

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

**Name: Sadiq ur Rahman………………………………………………… ID…14933…………………………………………………………**

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

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

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

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

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

**Answers**

**Ans No:1**

A parasite is an organism that lives on or in a host organism and gets its food from or at the expense of its host. There are three main classes of parasites that can cause disease in humans: protozoa, helminths, and ectoparasites.

Study of parasite as known as parasitology

**Classification of Parasite**

**Ectoparasite:** are organisms that live on the skin of a host, from which they derive their sustenance. The phylum Arthropoda includes the two-winged, or dipterous, flies. The larvae or maggots of these flies may invade living or necrotic tissue of animals and humans, producing myiasis.E.g: lice

**Endoparasite:** The parasite that live within the host are called endoparasite. Invasion by such parasite is called infection Eg. Leishmania

**Types of Endoparasite**

1. **Obligate parasite:** The parasite that cannot exist without a host are called obligate parasites.Eg. toxoplasma gonodii
2. **Facultative parasite:** The parasites that live a parasitic or free living existence when an opportunity arises are called facultative parasites. Eg: Naegleria fowleri
3. **Accidental Parasites:** The parasite that attack an unusal host are called accidental parasite. Eg. Echinococcus granulosus
4. **Aberrant parasites:** The parasite that during migration in the host, reach a site where they cannot live or develop further are called aberrant parasites Eg. Toxocara types

**Ans No:2**

**Protozoa:**

The word protozoa is come from Greek protozoon word meaning “First animal”

Peotozoa are unicellular (may be multicellular ) Eukaryotic microorganism. protozoa constitute a large group of about 65000 species . most of which are harmless free living and inhabits water and soil . a few species are pathogenic in nature parasitiz human and other animals causing hundreds of million of infections in a year around the world.

**Characteristics**

Mostly unicellular organism with fully functional cell . live freely may be parasitic or symbiotic . protozova are chemo-hetrotrops they are motile have locomotive organelles e.g flagella and cilia for movement .

**Morphology :**

Protozava are eutaryotic resemble to animal cell contain major cell organelles (including nucleus mitochondria ). They are microscopic in size less than 50 m . their organelles are highly specialized for feeding reproduction and movement . the cytoplasm of protozoa are divided into an outer layer called ectoplasm and an inner layer called endoplasm . ectoplasm helos in movement freeding and protection.

Endoplasm houses nucleus mitiochandria and food . some protozoa have secail appendages flagella and cilia that helps in their movements . freshwater protozoa have contractile vacuoles to pump out excess water . their shape many remain constant ( specially in ciliates) or change constantly (as seen in amoeba).

**Classification of protozoa on the basis of motility**

Protozoa are classified on the basis of their motility and method of reproduction

They are classified into four main types.

* Flagellates
* Ciliates
* Sarcodina
* Sporozoates

Flagellates:

Flagellates move by help of flagella (a tail-like structure). The movement is whip like Example of flagellates are

Trypnosoma ,Leishmenia (blood pathogen)

Giardia intestinal parasite

Trichomonas (reproductive tract pathogen)

**Ciliates:**

Ciliates protozoa have movement through cilia fine hair like structure attach with their body

Some protozoa have special kind of cilia for feeding and attachment.

Most are harmless.only one species baantidium coil is pathogenic for human causes a rare and server from of Dysentery.

**Sarcodina:**

Major loco-motor organelles in sarcodina is pseudopodia is amoeba

Most species are harmless.

**Sporozoites :**

Sporozoites are the only non motile form of protozoa .sporozites have well developed sexual and asexual stages. some common example of sporozoites and their infection are ( Plasmodium 100 to 300 million infection of malaria .

**Reproduction in protozoa**

Protozoa can reproduce their off spring by both sexual and asexual methods

* **Asexual methods of reproduction are:**
* Budding
* Binary fission
* Schizogony or multiple fission
* **Sexual methods**
* Conjugation
* Gametogony

**Sexual reproduction**

**Conjugation :**

Two protozoa met together and exchange their genetic material

**Gametogony:**

Union of two sexually differentiated cells.

**Ans No3:**

**Names of organelles and its functions present in paramecium and euglena**

**Paramecium:**

* **Cilia:** Movement food intake receptors.
* **Cytoplasm**: Supports the internal structures & shape and consistency of the cell.
* **Anal pore:** feces secretion.
* **Food vacuole:** digested the food.
* **Oral groove:** food intake through cilia (cytosome)(water currents
* **Micronucleus:** reproduction.
* **Macronucleus:** non- reproductive cell function e.g metabolisim
* **Contratile vacuole:** expels excess liquid on contraction .

**Euglena:**

* **Cytoplasm:** support the internal structure and shape and consistency of the cell
* **Nucleus:** contain the genetic material brain of the cell
* **Nucleolus:** contribute to ribosome synthesis
* **Chloroplast:** photosynthesis
* **Stigma:** allows the cells to sense light direction and intensity &respond to it
* **Photoreceptor:** light sensitivity protein involved in the sensing and response to the light
* **Contractile vacuole:** expels the excess water .
* **Flagellum:** movement.

**Ans NO4:**

**Antibiotic resistance:**

Occurs when an antibiotic has lost its ability to effectively control or kill bacteria l growth in other word thr bacteria are resistant and continue to multiply in the presence of therapeutic levels of an antibiotic .

**Maechanism of bacterial resistance**

**Denied access ;** antibiotics wants to pass the bacterial cell membrane but membrane become impermeable for antibiotic eg . lmipenem

**Antibiotic modification;** in second step antibiotic become modified by the help of bacterial enzyme e.g beta lactamase inactive penicillin.

**Altered target site;** antibiotic connot bind to its intended target because the target itself has been modified

**Pumping out ;** thee antibiotic faster than its gets in e.g tetracyclines

**Alternative target**: alternative pencillin binding protein

**Causes :**

**Over prescription of antibiotic:**

**1:** Physicians prescribe medicine without detecting the pathogen .

**2:** Prescribe broad sectrum antibiotics when the narrow spectrum is actually needed .

**Patient non-Compliance:**

**1:** Antibiotic are prescribed in a specific dose regiment.

**2:**Patient forget to take medicine on right time

**3:**Unable to afford full coarse.

**Over dose of antibiotics :**

* Antibiotics taken as OTC drug.
* Retail drug store presents a chaotic situation during drug distribution
* Patient demand for antibiotics for normal cold, fever.

**Use of Antibiotic on domestic animals:**

* A good chance for antibiotics to develop resistance.
* Spreading of resistance microbes through water and food.

**Poor quality of antibiotics :**

* Expired in fake antibiotics
* Due to lack of quilty compliance and monitoring.

**Poor hygiene and sanitation :**

* In some areas water from hospital are poorly filtrated which allows risistance bactria to escape.
* The bacteria spread when the people drink this water

**Solution to this resistance :**

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

**Ans No5:**

**Mechanisms of bacterial pathogencity**

**1;Invasiveness:** the ability to ivade tissues

Colonization (adherence and initial multiplication )

Production of extracellular substance which facilitate invasion (invasions) and

Ability to bypass or overcome host defense mechanism.

**2:Toxigenesis;** ability to produce toxins. Bacteria may produce two types toxins

Exotoxins and endotoxins

**Exotoxins:** are released from bacterial cells and may act at tissue site removed from the site of bacterial growth .

**Endotoxine** are cell-associated (classic sense

**Endotoxin** refers to the lipopolysaccharide component of the outer membrane of gram-negative bacteria .

* Endotoxins may be released from growing bacterial cells and cells that are lysed as a result of effective host defense or activities of certain antibiotic
* Hence bacterial toxins both soluble and cell associated mat be transported by blood and lymph and cause cytotoxic effect at tissue site . some bacterial toxins may also act at the site of colonization and play a role in invasion .

**Bacterial diseases**

**1:Pneumonia:**

Pneumonia is an inflammation of the lungs caused by bacteria, viruses, or chemical irritants.

The air sacs fill with pus and other liquid.

**Bacterial pneumonia:** most common of which is streptococcus pneumonia

**Symptoms:**

* Shaking, chills
* Chattering, teeth
* Severe chest pain
* High temperature
* Heavy perspiring
* Rapid pulse
* Rapid breathing
* Bluish color to lips and nail beds
* Confused mental state or delirium
* Cough that produces rust-colored or greenish mucus

**2:Typhoid:**

It’s a bacterial disease caused by salmonella typhi.

Transmitted to through ingestion of food or drink contaminated by the feaces or urine of infected people.

**Symptoms & causes**

**Symptoms:**

* Headache/ anorexia
* Abdominal discomfort
* Lethargy
* Diarrhea sustained fever as 103 0r 104 f
* Chest congestion vomiting
* Slow heart beat
* Soft palpable spleen
* Hepatomegaly

**Causes:**

* Contact with chronic asympathetic typhoid carrier
* Water is contaminated with sewerage system.

**END**