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Q No-2:- What do you know about parasite
Explain endo and ecto parasite in details.

Parasite:- it is define as an animal or
Plants that lives in or upon another organism
and draw its nutrient directly from it.

e.g Include Bacteria, viruses, Fungi,
Protozoas and helminths.

- The study of parasite is called parasitology.
- The study of Animals parasite that infect
and produce different diseases in human
is called Medical parasitology.

Classification of parasite.

- 1. **Ectoparasite:-** The parasite that lives
on the surface or in the superficial
tissues of the body are know as Ect-
oparasite.
e.g lice.
- 2. **Endoparasite:-** The parasite that
live within the host is called Endo-
parasite. invasion by such parasite is know as
infection. e.g Leishmania.

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Types of Endoparasite:

I Obligate parasite: The parasite that cannot exist without a host is known as obligate parasite. E.g. *Toxoplasma gondii*

II - Facultative parasites: The parasite that live a parasitic or free-living existence when an opportunity arises are called facultative parasite.

III - Accidental parasite: The parasite that attack an unusual host are called accidental parasite. E.g. *Echinococcus granulosus*.

IV - Aberrant parasite: The parasite that during migration in the host, reach a site where they cannot live live or develop further are called Aberrant parasite. E.g. *Toxocara typhes*.

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QNo2: Explain protozoa, its characteristics and morphology, also classify protozoa on the basis of motility and reproduction, into its types.

Answer:- Protozoa is the word protozoa is originated from protozoon word "First Animal" they are unicellular (might be multicellular).

Protozoa comprise an enormous gathering of around 65,000 species. The majority of which are innocuous free living and occupies water and soil not many. A couple of animal categories are pathogenic in nature parasite human and different creature causing several million of contamination in a year around the globe. **Characteristic:** Mostly unicellular living being with completely utilitarian edolive openly might be parasite or harmonious. Protozoa are chemo-heterotrophs, they are motile have various organelles.

For Example:

Flagella and cilia for development

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Morphology of protozoa.

Protozoa are eukaryotic look like creature cell, contain significant cell organelles (containing Nucleus, Mitochondria). They are infinitesimal in size under (50 μm). Their organelle are extremely exceptionally particular for taking care of, multiplication & development. The cytoplasm of protozoa is separated into an external layer called ectoplasma and an internal layer called endoplasma. Ectoplasma help in development, taking care of and protection. Flagella cilia that help in their developments. Freshwater protozoa have contractile vacuoles to siphon out abundance ~~continuously~~ water. Their shape may stay consistent (uniquely in ciliates) or change continuously (as found in amoeba).

Classification of protozoa.

Protozoa are classified on the basis of their motility and mode of reproduction.

Protozoa are classified into four main type

- Flagellates.
- Sarcodina
- Ciliates
- Sporozoites

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Flagellates:-

Flagellates move by the help of flagella, its compose of tail like structure, their movement is whip like. Examples are given below.

- Trypanosoma, Leishmania (blood pathogen)
- Giardiasis (intestinal parasite) and Trichomonas (reproductive tract pathogen)

Ciliates:-

Ciliates protozoa have a movement by with the help of cilia, spine like structure attached with their body. Some protozoa have special kind of cilia for feeding and attachment. Mostly are harmless. Only one species Balantidium coli is pathogenic for human causes a severe and severe form of dysentery.

So Sarcodina:-

Major loco-motor organelles in Sarcodina is pseudopodia (Pseudo means false, podia means feet). The common examples of Sarcodina is Amoeba. Mostly species are harmless and Entamoeba is a parasite for human causes intestinal disease.

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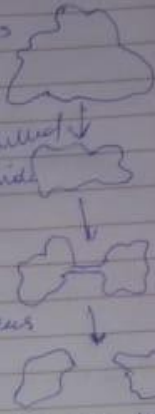
Binary Fission

Amoeba divides after it has grown to certain size.

The pseudopodia are pulled in and the nucleus divides.

The cell body begins to divide when the nucleus has split.

Two daughter amoeba are formed.



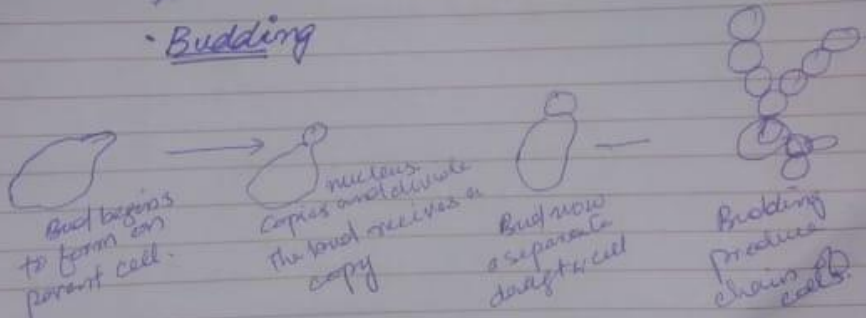
* Budding *

Bud begins to form on parent cell.

nucleus copies and divides. The bud receives a copy.

Bud now a separate daughter cell.

Budding produces chain cells.



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Q) NO 3: Write down names of organelles and its functions present in Paramecium and Euglena.

Ans - 3 Paramecium.

Names	FUNCTIONS:
Cytoplasm	Supports the internal structure and shape and consistency of the cell.
Anal pore	Feces secretion.
Food vacuole	Digests the food.
Oval groove - (Cytostome)	Food intake through cilia & water currents.
Cilia	Movement & food intake receptors.
Micronucleus	Reproduction.
Macronucleus	Non-reproductive cell functions e.g. metabolism.
Contractile vacuole	Expels excess liquid on contraction.

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Euglena.

Names	Functions.
Nucleus	Contains the genetic material - Brain of the cell.
Cytoplasm	Supports the internal structures and shape and consistency of the cell.
Nucleolus	Contributes to ribosome synthesis - movement.
Flagellum	
Chloroplast	Photosynthesis.
Stigma (eyespot)	Allows the cells to sense light direction and intensity and respond to it.
Contractile vacuole	Expels excess water.
Photoreceptor	Light-sensitive protein involved in the sensing.

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

Mechanism of Bacterial resistance.

01- Denied access:

Antibiotics want to pass the bacterial cell membrane but membrane becomes impermeable for antibiotics e.g. Imipenem.

02- Antibiotic modification:

In second step antibiotic becomes modified by the help of bacterial enzyme e.g. beta lactamase inactivates penicillin.

03- Altered target site:

Antibiotic cannot bind to its intended target because the target itself has been modified.

04- Pumping out:

The antibiotic faster than it gets in e.g. tetracyclines.

05- Alternative target:

(Typically enzyme) e.g. Alternative penicillin

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Poor quality of antibiotics:

- * Expired and fake antibiotics.
- * Due to lack of quality compliance and monitoring.

Poor hygiene and sanitation.

- ⇒ In some areas waste water from hospitals are poorly filtered which allows resistant bacteria to escape.
- ⇒ 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 leftover antibiotics.
- * Never share antibiotics with others.
- * Make information available on the impact of antibiotic resistance.

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binding protein (PBP2a) in MRSA.

Causes of antibiotic resistance: Prescription:

- 1- Physician prescribe medicine without detecting the pathogen.
- 2- Prescribe broad spectrum antibiotics when narrow spectrum is actually needed.

• Patient Non-compliance.

- 1- Antibiotics are prescribed in a specific dose regiment.
- 2- Patient forget to take medicine on right time.
- 3- Unable to afford all course.

Overdose of antibiotics:

- 1- Antibiotics taken as OTC drug.
- 2- Retail drug store presents a chaotic situation during drug description distributions.
- 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.

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Sporozoites:-

Sporozoites are the only non-motile form of protozoa. They cannot motile. Sporozoites have well developed sexual and asexual stage, they carry on both of these. Entire group is parasitic in nature and are harmful. Some common example of sporozoites and their infections are Plasmodium (causative agent of Malaria, causes 100 to 300 million infection world wide), Toxoplasma Gondii (causes Toxoplasmosis).

Reproduction in protozoa.

Protozoa reproduce sexually and asexually their offspring. Both types of reproduction take place in protozoa.

Method of Asexual reproduction

- Budding:- They can reproduce the offspring through budding, binary fission (schizogony or multiple fission).

Sexual method:- Sexual methods take place through conjugation and gametogony.

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Mechanism of Pathogenicity.

01- Invasiveness: The ability to invade tissues.

- * encompasses mechanisms for.
- * Colonization (adherence and initial multiplication).
- * production of extracellular substances which facilitates invasion (invasins) and
- * ability to bypass or overcome host defence mechanism.

02. Toxigenesis: ability to produce toxins.

- * Bacteria may produce two types of toxins
- i- exotoxins and
- ii- endotoxins.

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

ii- Endotoxins: are cell associated substances (classic sense, endotoxins refer to the lipopolysaccharide component of the outer membrane of Gram negative bacteria)

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- * Endotoxins may be released from growing bacterial cells, and cells that are lysed as a result of effective host defence, e.g. lysozyme or the activities of certain antibiotics (e.g. penicillin and cephalosporins)
- * Hence, bacterial toxins, both soluble and cell associated, may be transported by blood and lymph, and cause cytotoxic effects at tissue sites.
- * Some bacterial toxins may also act at the site of colonisation and play a role in invasion.

Bacterial pathogenesis.

- * Infection/entry
- * Virulence factors
- * Pathogenesis
- * Escape of immune surveillance

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Two Bacterial Disease.

Typhoid

It is a bacterial disease caused by *Salmonella typhi*.

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

Symptoms and Causes

Syptoms:

Headache
Abdominal Discomfort
Lethargy
Diarrhea
Sustained fever as 103 or 104
Chest Congestion.
Vomiting
Slow Heart beat
Hepatomegaly
Sgt palpable spleen.
Diarrhea.

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Causes.

Contact with chronic asymptomatic typhoid carrier

Water is contaminated with Sewerage System -

Bronchitis.

Bronchitis is an inflammation in the lungs that some people call a chest cold.

Symptoms

- o Fatigue
- o wheezing sounds when breathing
- o Shortness of Breath
- o Production of mucus (sputum)

which can be clear, white, yellowish-gray or green in color - rarely, it may be streaked with blood -

- o Tightness or dull pain in chest

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Causes

- o viruses usually
(Influenza virus)
- o Air pollution
- o Dust
- o Cold
- o Flu.