

B.L.D.E. Association's

**S. B. Arts & K.C.P. Science College,
VIJAYAPUR- 586 103.**



ASSIGNMENT

For B.A./ B.Sc.^V..... Semester
2022 - 2023

Name of the Student Preeti. C. Houti

Roll No. 221 R.C.U. Seat No. 52028564

Subject Zoology (Paper - II)

Assignment No.	Date	Marks Assigned	Marks Obtained	Name and Signature of Teacher	Remarks
1	30/11/23	03	03	Keerthi M. Todager	Good
2					
3					
4					

① explain structure of plasma membrane

The plasma membrane is the unique membrane that forms the boundary of the cell & separates it from the surrounding environment. The mammalian erythrocyte is extensively used to study the structure of the plasma membrane as it is can be easily lysed & the membrane separated. The wickerham plasma membrane was proposed by J.K. wickerham in 1931. The ultra structure of plasma membrane of different cells like amoeba, liver cells, eggs of sea urchin, nerve fibre etc were studied using the electron microscope and x-ray diffraction.

Various theories were proposed regarding the structure of plasma membrane. Some of these theories are given below.

Danielli and Davson model

Hugh Davson & James Danielli proposed the sandwich model in 1935. According to them there were two phospholipid layers between two layers of protein. The lipid layers were about 6.0 nm in thickness in thickness and each protein layer was 1.0 nm in thickness. The total thickness being 8.0 nm. The membrane had pores lined by protein and this allowed only the polar solute molecule and ions to pass through. This theory gained acceptance after the electron microscope revealed that the plasma membrane had two dark layers separated by a central clear area, and the total thickness was 7.5 nm.

Unit membrane theory -

David Robertson in 1960 proposed the hypothesis that all cell membranes were alike. They had typical twilaminal structure of having two dark band separated by a light band. However all membranes in a cell vary in thickness & electron density. the inner mitochondrial membrane is thin (50A) and the plasma membrane is thick (100A). the ratio of protein & lipids was also variable.

The singer and nicolson model - fluid mosaic model.

S.J singer and garth nicolson proposed the fluid mosaic model of the plasma membrane in the year 1972. They have formulated their model based on the previous theories. They retained the bilayer model of phospholipid, but they proposed that the lipid bilayer was not an unbroken layer but was penetrated by protein. According to this theory the membrane is made up of a bilayer of phospholipids, which have the consistency of olive oil and in which the protein are embedded either partially or completely.

The lipid constitute the fluid part of the membrane and the protein embedded in it form a mosaic pattern.

The lipid from the matrix of the membrane and the protein have specific function to perform.

The components of the plasma membrane are as follows -

* Lipid * cholesterol * protein * carbohydrates

(2) Functions of plasma membrane.

The plasma membrane functions as enzyme for example - peroxidase on epithelial cells lining the digestive tract contain enzyme on the surface of the membrane.

2. The plasma membrane have protein that act as receptors. example the hormones circulating in the blood bind only to specific cells called target cell as they cavity on their surface receptor protein. nerve cell also cavity receptor sites on proteins at the synaptic junction.

The plasma membrane has antigens on them that act as identify markers. The antigens give the cells their specific identity. The glycoprotein chains on the membrane surface act as markers allow the immune system to recognize the cells as their own. It also help the immune system to identify the presence of foreign antigens.

The glycoprotein chain - on the membrane help in cell to-cell recognition. they act as receptor for chemical signals. they help the cell of one kind to stick to each other in a tissue and function in a similar fashion.

The protein on the cell membranes help in energy transfer where special reaction take place in the chloroplast where photosynthesis occur & in mitochondria where respiration occur.

The presence of cell-cell interactions is possible due to the plasma membrane. the presence of tight junction, desmosomes & gap junction help in sealing the tissue & also help in intercellular communication.

③ write a note on endoplasmic reticulum.

Endoplasmic reticulum is a complex system of intercommunicating membrane bound tubules, vesicles and flattened sacs. Porteur coined a term endoplasmic reticulum in 1945. He observed this system or network in the liver cells. The ER is mainly in the endoplasmic thus it is called endoplasmic & the word reticulum means net like or network. The ER divide the cytoplasm into two compartments. One compartment is within the membrane & the other outside which is called cytosol or cytoplasmic matrix.

ER is seen in all eukaryotic cells. ER was discovered after the electron microscope was invented and cultured cells were viewed. Thin sectioning and freeze fracture technique helped in detailed study of the ER. Cell fractionation technique biochemical analysis, cytochemical techniques helped in the studying of the enzyme & their component of the ER. Finally use of fluorescent dyes helped in studying the enzyme & other component of the ER. Finally use of fluorescent dyes helped in studying ER in living cell.

Morphology.

ER is major part of cytoplasmic membrane system. The cytoplasmic membrane system comprise of - The nuclear envelope - The ER. The golgi apparatus. The membrane of the ER has two faces. The cytoplasmic face that is towards the cytoplasm & luminal face that is towards the lumen or cavity of the ER.

* Lamellae or cisternae.

* Vesicles or cavities and

* Tubules

Cisternae - They are long flattened sac like structure that are not branched they are arranged parallel to each other and form stacks. They are associated with ribosome and are seen in actively secreting cells such as pancreatic cell.

Vesicles - They are oval structure with diameter of 25 to 500 microns. They are most often seen in cell having SER or smooth endoplasmic reticulum.

Tubules - The tubules are branched structure found along with the vesicles and cisternae. They have a diameter of 50 to 100 micrometers and occur in almost all cells.

The component of the ER are made up of thin membrane which is around 60-80 thick. The membrane is similar to the plasma membrane & its continuous with nuclear membrane golgi complex & plasma membrane.

The space between is the cavity of the endoplasmic reticulum & smooth endoplasmic reticulum due to the presence or absence of ribosome.

Rough endoplasmic reticulum - ER is associated with ribosome is called Rough ER or RER. The rough ER provides space for the attachment of the ribosome. The ribosome are seen on the outer surface of the membrane. As there are special receptors or binding site.

4)

Write a note on Carcinogen?

Carcinogen definition is any substance that cause cancer. Cancer is uncontrolled cell growth. It's a disease where cells of the body get damaged. Carcinogenic substance generally increase the risk of cancer because they damage the cells.

— Cause of cancer

Ionization radiations like x-rays, gamma-rays, non-ionizing uv cause DNA damage leading to neoplastic transformation.

The chemical carcinogen present in tobacco smoke have been identified as major cause of lung cancer.

Cancer causing viruses are called oncogenic viruses have genes called viral oncogenes.

Several gene called cell cycle oncogenes have been identified in normal cells which when activated under certain condition, caused lead to cancer.

— Prevention —

- * Should stop used of tobacco.
- * Eat healthy food
- * Have to maintain healthy weight & be physically active.
- * Protection from the sun.
- * Protection of UV rays
- * getting vaccination
- * Should avoid risky behaviour
- * Regular general checkup or medicinal care has to be done.

5)

Show note on aging theory

Aging is the process during which structural & functional changes accumulate in an organism with time.

The modern theory of aging in human falls into two main categories —

① Programmed theory

② The damage environment theory.

① The Programmed theory —

Programmed longevity suggest that ageing is the result of a sequential switching on & off of some gene & senescence is defined as the time when age associate deficits are manifested. The endocrine theory says that biological clocks act through hormones to control the state of ageing.

The immunological theory states that our immune system programmed to weaken over time which leads to an increased vulnerability of infectious disease & thus ageing and death.

② The damage & environment theory.

wear & tear theory, where the vital parts in our cells & tissue lose their function over wear out of leading to ageing. The wear & tear theory keep up with the theory that the quantity is an organism's rate of oxygen basal metabolism. the slower will be the life span.

Cross-linking theory state that the accumulation of cross linked protein damage cells & tissue which show down bodily function & result in ageing.

Free radical theory states that superoxide & other free radical cause injuries to the macromolecular component of the cells. - damaging various tissue & eventually the organs leads to function.

DNA damage theory state that genetic damage mutations etc. can cause abnormal gene expression which cause DNA damage & induces cells to undergo apoptosis.

⑥ Explain apoptosis & necrosis & mention significance.

Apoptosis -

It is defined as natural biological process of programmed cell destroy themselves for maintaining the smooth functioning of the body.

The process plays a major role in the development of humans & in developing & maintaining a healthy immune system.

on average 50-80 billion cells die every day in human adult due to apoptosis.

Significance -

It help to maintain homeostasis in the multicellular organisms.

Proper size of the body is maintained by apoptosis.

Apoptosis maintain the constancy of number in an organisms.

The unwanted cells are eliminated from the body of an organisms by apoptosis.

The dangerous T-lymphocytes are eliminated by apoptosis.

Programmed cell death is crucial for cell development.

The separation of the fingers during the development of the foetus is due to apoptosis.

It result in the closure of the neural tube in the dorsal part.

Ex - metamorphosis in frogs.

As the tadpole transform into a frog, it destroy & absorb its entire structures.

Necrosis -

* It's kind of cell death where the cell dies in an untimely way due to some uncontrolled external factors.

* It's caused by external agent such as infection & toxins.

* The cell membrane breaks & releases the cell content & it's always damaging & harmful.

The symptoms like inflammation, tissue death & decrease blood flow at the infected site are observed during the process.

Significance -

* It's highly pro-inflammatory form cell death, and result in the release of alarmins out danger signals, such as heat shock protein.

uric acid, ATP, DNA & nuclear protein that alert & activate the innate immune system.

Targeting necrotic cell death may prove to be effective treatment for immune mediated nephropathies.

⑦ write a note on Bioremediation.

Bioremediation is process of removing or utilizing the pollutants from a particular polluted area with a help of micro-organisms like bacteria, fungi & also plants.

It's type of biotechnical waste management method which uses no harmful chemical in order to protect the earth & promotes a substantial environment.

Types -

① Microbial remediation - This type of bioremediation process is done with the help of micro-organisms which convert the organic contaminants into more chemically inactive forms.

The micro-organisms break down the compound & metabolize them.

② Phyto remediation -

This help to eliminate contaminants with the help of plant by upsurging & regenerating the soil ground & surface of water.

The plant used in the process of disseminate the toxic material from the soil and hold

on to them within their plant tissue & construct them until they are broken down at the roots which accumulates in the stems. plants take up the dangerous chemical from the soil & release them into the air through transpiration & evaporation by the air.

Mycoremediation -

Fungi are known as nature's decomposer. They break down most of the earth's plant & hard woody material, resulting in the regeneration of the soil.

Fungi use their metabolic enzyme to decompose chemicals like metals & various type of pesticides.

Advantage -

- Can be done on site
- Permanent elimination of waste
- Biological systems are cheaper
- Positive public acceptance
- Long-term liability risk reduced
- Minimum site disruption
- Reduces transportation cost & liability
- Can be applied with other treatment techniques

Disadvantage -

- Some chemicals can not be bioremediated
- extensive monitoring requirement
- site-specific requirement
- Toxicity of contaminants
- scientific intensive
- Potential production of unknown by-product
- Perception of improved technology

⑧ Write a note on Food Fermentation

Fermentation is an enzyme catalysed, metabolic process where by organisms convert starch or sugar to alcohol or an acid anaerobically releasing energy. The science of fermentation called zymology.

Process of Fermentation -

Fermentation is an anaerobic biochemical process in fermentation. the first process is the same as cellular respiration, which is the formation of pyruvic acid by glycolysis where net 2 ATP molecules are synthesized. In the next step pyruvate is reduced to lactic acid, ethanol or other product, hence NAD^+ is formed which is re-utilized back in the glycolysis process.

Types of Fermentation.

~~Homolactic Fermentation - only one type of product formation.~~

~~Heterolactic Fermentation - more than one product formed.~~

1. Lactic acid Fermentation -

Lactic acid formed from pyruvate produced in glycolysis. NAD^+ is generated from $NADH$ enzyme lactate dehydrogenase catalyse this reaction. Lactobacillus bacteria produce curd from milk via this type of

fermentation. During intense exercise when oxygen supply is inadequate, muscles derive energy by producing lactic acid, which gets accumulated in the cells causing fatigue.

Alcohol Fermentation -

This is used in the industrial production of wine, beer, biofuel, etc. The end product is alcohol and CO_2 . Pyruvic acid breaks down into acetaldehyde and CO_2 is released. In the next step ethanol is formed from $NADH$ utilized in glycolysis. Yeast & some bacteria carry out this type of fermentation. Enzyme pyruvic acid decarboxylase & alcohol dehydrogenase catalyse these reaction.

3. Acetic acid Fermentation -

Vinegar is produced by this process. This is a two-step process.

The first step is the formation of ethyl alcohol from sugar anaerobically using yeast.

In the second step, ethyl alcohol is further oxidized to form acetic acid using acetoacetic bacteria. Microbial oxidation of alcohol to acid is an aerobic process.

Advantage of Fermentation -

- Wine, beer, biofuels, yoghurt, pickles, Bread.
- Sour foods containing lactic acid.
- Certain antibiotics & vitamins.
- It improve digestion & helps to maintain intestinal bacteria.
- It has anti-cancer effect.
- Reduce lactose intolerance.
- Improve immune system.

Q write a note on research methodology

Research methodology is a way to systematically solve the research problem. It may be understood as a science of studying how research is done scientifically. In it we study the various steps that are generally adopted by a researcher in studying his research problem along with the logic behind them.

It's necessary for a researcher to design his methodology for his problem as the same way differs from problem to problem. For example - an architect, who designs a building has to consciously evaluate of his decision i.e. he has to evaluate why and on what basis he selects particular size, number & location of doors, windows & ventilations uses particular material & not others & the like. Similarly in research the scientist has to expose the research design to evaluation for they are implemented.

From what has been stated above, we can say that research methodology has many dimensions and research method to constitute a part of the research methodology. The scope of research methodology is wider than that of research method.

Motivation in Research -

* Desire to get a research degree along with its consequential benefits.

Desire to face the challenge in solving the unsolved problem i.e. concern over practical problem initiates result

• Desire to get ~~intercellular~~ joy doing some creative work

• Desire to be of service of society.

• Desire to get respectability

~~for logs~~

B.L.D.E. Association's

**S. B. Arts & K.C.P. Science College,
VIJAYAPUR- 586 103.**



ASSIGNMENT

For B.A./ B.Sc. [✓].....^{IInd} Semester
2022 - 2023

Name of the Student Vidyashree .R. Navi
Roll No. 143 R.C.U. Seat No. U15KM22S0195
Subject Parasitology.

Assignment No.	Date	Marks Assigned	Marks Obtained	Name and Signature of Teacher	Remarks
1	20/11/23	10	10	Manjunath. C.K	
2					
3					
4					

B.L.D.E. Association's

**S. B. Arts & K.C.P. Science College,
VIJAYAPUR- 586 103.**



ASSIGNMENT

For B.A./ B.Sc. VI Semester
2022 - 2023

Name of the Student Shashi- Aravind
Roll No. 302 R.C.U. Seat No. 52028805
Subject Zoology - P-II

Assignment No.	Date	Marks Assigned	Marks Obtained	Name and Signature of Teacher	Remarks
1	21/7/23	03	03	Manjunath. C. Kolakur	
2				<i>[Signature]</i>	
3					
4					