
#424357

Topic: Morphology and anatomy of frog

What is the difference between direct and indirect development?

Solution

Direct Development:

In direct development, the young ones resemble the adult in both morphology and physiology.

Example: Human beings

Indirect Development:

In indirect development, the young ones differ from the adult in both morphology and physiology.

Example: Tadpole larva of a frog.

#424397

Topic: Morphology and anatomy of cockroach

What is the position of ovaries in cockroach?

Solution

Cockroach belongs to phylum Arthropoda. The body of cockroach has three segments known as head, thorax and abdomen. The female reproductive system of cockroach consists of two large ovaries. The ovaries lie laterally in the 12th and 13th segments. Each ovary is formed of a group of eight ovarian tubules or ovarioles. They contain a chain of developing ova. Oviducts from each ovary unite into a single median oviduct.

#424398

Topic: Morphology and anatomy of cockroach

How many segments are present in the abdomen of cockroach?

Solution

Cockroach belongs to phylum Arthropoda. The body is divided into head thorax and abdomen. The abdomen consists of 10 segments. The boat shaped 7th segment together with the 8th and 9th sterna forms a brood or genital part. In both sexes, the 10th segment bears of pair of jointed filamentous structures called anal cerci.

#424399

Topic: Morphology and anatomy of cockroach

Where do you find malpighian tubules?

Solution

The Malpighian tubule system is an excretory and osmoregulatory system found in some insects, myriapods, arachnids, and tardigrades. It is present as a ring of the filamentous structure at the junction of midgut and hindgut. It absorbs solutes, water, and wastes from the surrounding hemolymph. These tubules are found in cockroaches.

#424400

Topic: Morphology and anatomy of earthworm

Answer the following:

- (i) What is the function of nephridia?
- (ii) How many types of nephridia are found in earthworm based on their location?

Solution

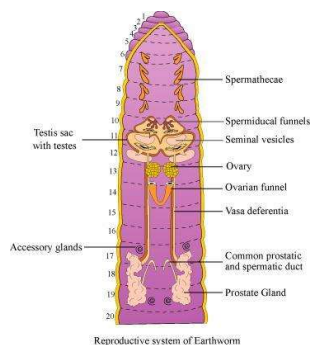
- (i) Nephridia are segmentally arranged excretory organs present in earthworms.
- (ii) On the basis of their location, three types of nephridia are found in earthworms. They are :
 - (a) Septal nephridia : These are present on both sides of the intersegmental septa behind the 15th segment and they open into the intestine.
 - (b) Integumentary nephridia : These lie attached to the body wall from the third segment to the last segment, which opens on the body surface.
 - (c) Pharyngeal nephridia : These are present as three paired tufts in fourth, fifth, and sixth segments.

#424401

Topic: Morphology and anatomy of earthworm

Draw a labelled diagram of the reproductive organs of an earthworm.

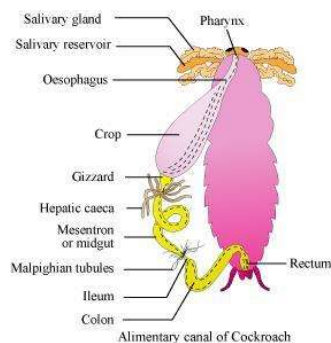
Solution



#424402

Topic: Morphology and anatomy of cockroach

Draw a labelled diagram of alimentary canal of a cockroach.

Solution

#424403

Topic: Morphology and anatomy of earthworm

Distinguish between the followings

- (a) Prostomium and peristomium
- (b) Septal nephridium and pharyngeal nephridium

Solution

Prostomium :

Prostomium is a small fleshy lobe, which overhangs the mouth of an earthworm. It helps the organism push into the soil and is sensory in function.

Peristomium :

The first body segment in the earthworm is called the peristomium. It surrounds the mouth opening.

Septal nephridium :

They are present on both sides of intersegmental septa behind the 15th segment and they open into the intestine.

Pharyngeal nephridium :

They are present as three paired tufts in the fourth, fifth, and sixth segments.

#424405

Topic: Epithelial tissue

What are the following and where do you find them in animal body.

- (a) Chondrocytes
- (b) Axons
- (c) Ciliated epithelium

Solution

Chondriocytes :

They are cells of cartilages and are present in small cavities within the matrix secreted by them.

Axons :

They are long, slender projections of neurons that help in carrying nerve impulses away from the neuron body. Axons aggregate in bundles which make up the nerves.

Ciliated epithelium :

It consists of simple columnar or cuboidal epithelium with cilia on their free surfaces. It is present on the inner surface of the oviducts and bronchioles. Where it helps in the movement of eggs or mucus in specific directions.

#424406

Topic: Epithelial tissue

Describe various types of epithelial tissues with the help of labelled diagrams.

Solution

Epithelial tissue lines the surface of a body and forms a protective covering. Epithelium cells are packed tightly together with a little intercellular matrix.

Epithelial tissue in the body is of two types -

A. Simple epithelium: It consists of a single layer of cells where cells are in direct contact with the basement membrane. It is further sub-divided into the following types:

(i) Simple squamous epithelium: It consists of a single layer of flat cells with irregular boundaries. It is found in the walls of the blood vessels and in the lining of alveoli.

(ii) Simple cuboidal epithelium: It consists of a single layer of cube-like cells. It is present in regions where secretion and absorption of substances take place such as the proximal convoluted tubule region of the nephron.

(iii) Simple columnar epithelium: It consists of a single layer of tall, slender cells with their nuclei present at the base of the cells. They may bear microvilli on the free surfaces.

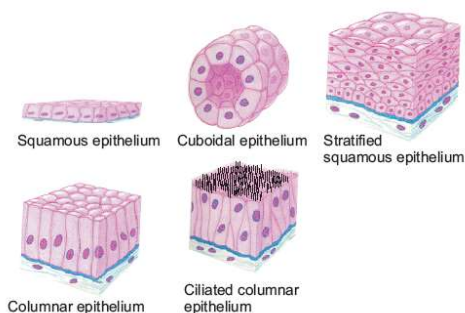
Columnar epithelium forms the lining of the stomach and intestines and is involved in the function of secretion and absorption.

(iv) Ciliated epithelium: It consists of columnar or cuboidal cells with cilia on their free surfaces. They are present in bronchioles and oviducts from where they direct mucus and eggs in specific directions.

(v) Glandular epithelium: It consists of columnar or cuboidal cells involved in the secretion of substances. Glands are of two types, unicellular glands (goblet cells of the alimentary canal) and multicellular glands (salivary glands). They can be classified as exocrine (ductless glands) and endocrine glands (duct glands) by the method through which they release their secretions.

B. Compound epithelium: It consists of many layers of cells. It is involved mainly in the function of providing protection and has a limited role in secretion and absorption.

Dry surface of the skin or moist inner lining of the buccal cavity, pharynx, pancreatic ducts and the inner lining of ducts of salivary glands are some of the examples of the compound epithelium.



#424407

Topic: Epithelial tissue

Distinguish between

- (a) Simple epithelium and compound epithelium
- (b) Cardiac muscle and striated muscle
- (c) Dense regular and dense irregular connective tissues
- (d) Adipose and blood tissues
- (e) Simple gland and compound gland

Solution

(a) The difference between simple epithelium and compound epithelium are given below:

Simple Epithelium	Compound Epithelium
1. A single layer of epithelial cells resting on a basement membrane are called as simple epithelium.	1. It consists of more than one layer. The innermost layer of cells is arranged on the basement membrane.
2. They are present in the secretory and absorptive surface.	2. They are not involved in secretory or absorptive functions.
3. It is not protective as it can't resist the damages due to mechanical or chemical abrasions.	3. Because of the multi-layered structure, they help in the protection of tissues below them.
4. Squamous, cubical, columnar epithelium, etc.	4. They may be transitional or stratified, i.e., stratified squamous epithelium.

(b) The difference between Cardiac Muscle and Striated Muscle are given below :

Cardiac Muscle	Striated Muscle
1. Heart muscles are known as cardiac muscle.	1. Striated muscle is otherwise called as striped or skeletal muscle as it is attached to the skeleton
2. These are short cells attached the head to tail.	2. These are long cells, present in bundles, enclosed in the sarcolemma.
3. Mitochondria and glycogen are more abundant.	3. Comparatively less.
4. Faint but light and dark bands.	4. Prominent regular strips of light and dark bands.
5. Cells are branched and connected to next cells by intercalated disc.	5. Unbranched cells without in interconnections.
6. It is involuntary muscle.	6. It is voluntary muscle.

(c) The difference between dense regular and dense irregular connective tissue are given below:

Dense regular connective tissue	Dense irregular connective tissue
1. In dense regular connective tissues, collagen fibres are present in rows between parallel bundles of fibres.	1. In dense irregular connective tissues, fibres are arranged irregularly.
2. They are present in tendons and ligaments.	2. They are present in the skin.

(d) The difference between adipose and blood tissue are given below:

Adipose tissue	Blood tissue
1. It is composed of collagen fibres, elastin fibres, fibroblasts, macrophages, and adipocytes.	1. It is composed of RBCs, WBCs, platelets, and plasma.
2. It helps in the transportation of food, wastes, gases, and hormones.	2. It helps in the synthesis, storage, and metabolism of fats.
3. It is present beneath the skin.	3. It is present in the blood vessels.

(e) The difference between simple gland and compound gland are given below:

Simple Gland	Compound Gland
1. Gland without branching duct is called as a simple gland.	1. Gland with branched ducts called as the compound gland.
2. The glandular cells are arranged in the form of tubes or sacs.	2. The glandular cells are present in separate pockets which discharge their contents in an in the duct.
3. Sweat gland, oil gland.	3. Duodenal glands, pancreas, etc.

#424408

Topic: Muscle tissue

Distinguish between cardiac muscle and striated muscle.

Solution

Cardiac muscles are known as heart muscle. These are short cells attached the head to tail. Mitochondria and glycogen are more abundant. Light and dark bands are present. Cells are branched and connected to next cells by intercalated disc. It is an involuntary muscle.

Striated muscle is otherwise called as striped or skeletal muscle as it is attached to the skeleton. These are long cells, present in bundles, enclosed in the sarcolemma. It has prominent regular strips of light and dark bands. The cells are unbranched cells without in interconnections. It is a voluntary muscle.

#424409

Topic: Connective tissue

What is the difference between dense regular and dense irregular connective tissues?

Solution

Dense regular connective tissues	Dense irregular connective tissues
The bundles of while collagen fibres arranged in a parallel manner.	The bundles are present in random fashion.
Tendons are the example of a dense regular connective tissue that connects muscles to bones and ligaments that connect bones to other bones at joints.	It is found in the inner portion of the skin. For example, fibroblast cells.

#424410

Topic: Connective tissue

Distinguish between adipose and blood tissue.

Solution

Adipose tissue	Blood
Adipose tissue is a type of loose fibrous connective tissue. It has enlarged fibroblasts and limited extracellular matrix.	Blood is a specialized connective tissue. It has cells suspended in a liquid matrix called plasma.
It serve to store fat in the fibroblasts.	It serves to transport respiratory gases and nutrients.

#424412

Topic: Connective tissue

Mark the odd one in each series.

- (a) Areolar tissue; blood; neuron; tendon
- (b) RBC; WBC; platelets; cartilage
- (c) Exocrine; endocrine; salivary gland; ligament
- (d) Maxilla; mandible; labrum; antennae
- (e) Protonema; mesothorax; metathorax; coxa

Solution

- (a) Areolar tissue, blood, and tendons are examples of connective tissues. A neuron is an example of neural tissue.
- (b) RBCs, WBCs, and platelets are the three most important components of blood (fluid connective tissue) while cartilage is skeletal connective tissue.
- (c) Exocrine, endocrine, and salivary glands are examples of the simple glandular epithelium. The ligament is a connective tissue.
- (d) Maxilla, mandible, and labrum are mouth parts of a cockroach; white antennae are present in the head constituent of the region of cockroaches.
- (e) Prothorax, mesothorax and metathorax are parts of the thorax of cockroach and present in the legs of a cockroach. Protonema is usually a filamentous structure produced by the germination of the spore in mosses and certain related plants, and from which the leafy plant which bears the sexual organs arises as a lateral or terminal shoot.

#424414

Topic: Morphology and anatomy of earthworm

Mention briefly about the circulatory system of earthworm.

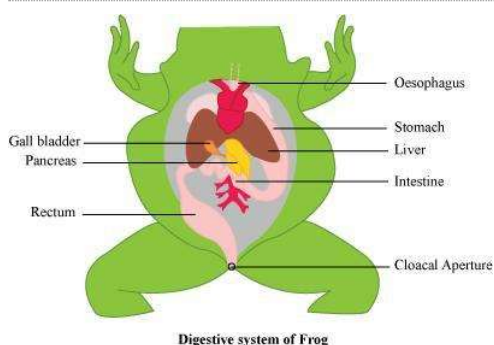
Solution

Earthworm (Pheretima) have closed blood vascular systems, which consists of the heart, blood vessels, and capillaries. The heart pumps blood for circulating it in one direction. Blood is supplied by smaller blood vessels to the gut, nerve cord and the body wall. Blood glands are present in the 4th, 5th, and 6th segments, which produce blood cells and haemoglobin dissolved in blood plasma. Blood cells in earthworms are phagocytic in nature.

#424415

Topic: Morphology and anatomy of frog

Draw a neat diagram of digestive system of frog?

Solution

#424416

Topic: Morphology and anatomy of earthworm

Mention the function of the following

- (a) Ureters in frog
- (b) Malpighian tubules
- (c) Body wall in earthworm

Solution

- (a) Ureters in frogs: A ureter acts as a urinogenital duct, which carries sperms along with urine in male frogs.
- (b) Malphigian tubules: Malphigian tubules are excretory organs in cockroaches.
- (c) Body wall in earthworms: In earthworms, the body wall consists of muscle layers. It helps in movement and burrowing.

#424990

Topic: Connective tissue

Why do we consider blood as a connective tissue?

Solution

Connective tissues have cells scattered throughout an extracellular matrix. They connect different body systems. Blood is considered as a type of connective tissue because of two reasons.

- (i) Like the other connective tissues, blood is mesodermal in origin.
- (ii) It connects the body systems, transports oxygen and nutrients to all the parts of the body, and removes the waste products. Blood has an extra-cellular matrix called plasma with red blood cells, white blood cells, and platelets floating in it.

#425116

Topic: Muscle tissue

How do you distinguish between a skeletal muscle and a cardiac muscle?

Solution

Skeletal muscle	Cardiac muscle
1. The cells of skeletal muscles are unbranched.	1. The cells of cardiac muscles are branched.
2. Intercalated disks are absent.	2. The cells are joined with one another by intercalated disks that help in coordination or synchronisation of the heartbeat.
3. Alternate light and dark bands are present.	3. Faint bands are present.
4. They are voluntary muscles.	4. They are involuntary muscles.
5. They contract rapidly and get fatigued in a short span of time.	5. They contract rapidly but do not get fatigued easily.
6. They are present in body parts such as the legs, tongue, hands, etc.	6. These muscles are present in the heart and control the contraction and relaxation of the heart.

#464538

Topic: Muscle tissue

What is the specific function of the cardiac muscle?

Solution

The uninucleated, striated, tubular and branched muscles that form the wall of heart are known as cardiac muscles. They serve to bring about rhythmic contraction and relaxation of heart to allow pumping of blood throughout the life. Since, these muscles contract without any nerve stimulation/control, they are involuntary in nature.

#464539

Topic: Muscle tissue

Differentiate between striated, unstriated and cardiac muscles on the basis of their structure and site/location in the body.

Solution

Difference between striated, unstriated and cardiac muscles

	Striated muscles	Unstriated muscles	Cardiac muscles
Structure	Also known as skeletal muscles, they have striated, tubular, multinucleated, unbranched and tubular fibres.	Also known as smooth muscles, they have non-striated, spindle shaped, uninucleated fibres.	Cardiac muscles have striated, tubular, uninucleated, branched fibres.
Location	They are found attached to skeleton.	They are found in walls of internal organs.	They are found in walls of heart.

#464540

Topic: Epithelial tissue

Identify the type of tissue in the following: skin, bark of tree, bone lining of kidney tubule, vascular bundle.

Solution

1. Skin: Squamous epithelium (thin, flattened, irregularly shaped cells with centrally placed nucleus).
2. Bark of tree: Cork (protective tissue with dead suberized cells)
3. Bone: Skeletal tissue/osseous tissue
4. Lining of kidney tubule: Cuboidal epithelial tissue (cube like cells with hexagonal appearance and central, spherical nucleus).
5. Vascular bundle: xylem (tracheids, vessels, fibres and parenchyma) and phloem (sieve elements, companion cell, phloem fibres and phloem parenchyma)

#464544

Topic: Connective tissue

Name the following.

- (a) Tissue that forms the inner lining of our mouth.
- (b) Tissue that connects muscle to bone in humans.
- (c) Tissue that transports food in plants.
- (d) Tissue that stores fat in our body.
- (e) Connective tissue with a fluid matrix.
- (f) Tissue present in the brain.

Solution

1. Tissue that forms the inner lining of our mouth.

Answer: Simple epithelium

2. Tissue that connects muscle to bone in humans.

Answer: Tendon

3. Tissue that transports food in plants.

Answer: Phloem

4. Tissue that stores fat in our body.

Answer: Adipose tissue

5. Connective tissue with a fluid matrix.

Answer: Blood

6. Tissue present in the brain.

Answer: Nervous tissue

#465165

Topic: Muscle tissue

Diagrammatically show the difference between the three types of muscle fibres.

Solution

Three types of muscle fibres are smooth muscle (non-striated), cardiac muscles and skeletal muscles (striated muscles).

