

BIODIVERSITY OF ANIMALS: INVERTEBRATES**06 MARCH 2014****Lesson Description**

In this lesson, we:

- Look at the body plans of invertebrates with respect to:
 - symmetry
 - tissue layers
 - cephalisation
 - openings in gut
 - coelom
 - blood system

**Summary****Symmetry**

There are three types of symmetry:

- Asymmetry - The organism cannot be divided in any way to get two identical halves.
- Radial symmetry - A body plan in which body parts repeat around center of body
- Bilateral symmetry - A single plan of symmetry that produces mirror halves.

Tissue Layers

At a certain stage of embryonic development the cells start to move into different layers and start to differentiate.

In most of the organisms, but not all, all three layers start to appear

- Endoderm
- Mesoderm
- Ectoderm

Cephalisation

Cephalisation refers to how developed the neuro-system is. The more complex the organism becomes, the more the nervous tissue develops and specialises.

Body Cavities

- A body cavity is a fluid-filled space that lies between the digestive tract and the outer body wall. This is called a Coelom.
- Diploblastic organisms don't have such a body cavity.
- Triploblastic organisms may have a true Coelom or a false Coelom.
- True coelom are called Coelomate.
- False coelom are called Pseudocoelomate. (Pseudo means false.)

Types of Guts

There are two types of guts:

- The first gut only has one opening for both the intake of food and the excretion of waste.
- The second gut is a through gut. This gut has two openings, one for ingestion and one for excretion.



Test Yourself

Question 1

A characteristic of animals belonging to the Platyhelminthes is that their bodies are

- A. flattened
- B. segmented
- C. round
- D. undifferentiated

Question 2

The earthworm is triploblastic since the ...

- A. body is divided into three areas
- B. segments each contain three openings
- C. organism develops from three layers of cells
- D. development progresses through three stages

Question 3

Hydra belongs to the phylum Coelenterata because it has a

- A. mouth
- B. gastro-vascular cavity
- C. anus
- D. foot

Question 4

The symmetry of a starfish can be describe as

- A. Bilateral Symmetry
- B. Radial Symmetry
- C. Asymmetrical
- D. Longitudinal symmetry

Question 5

Cephalisation is most likely to be associated with

- A. a primitive nerve network
- B. radial symmetry
- C. sedentary types of animals
- D. bilateral symmetry

Question 6

Hydra can be described as

- A. bilaterally symmetrical
- B. coelomate
- C. diploblastic
- D. triploblastic

Question 7

The process whereby an organism absorbs digested food and makes it part of its own body is called

- A. assimilation
- B. absorption
- C. ingestion
- D. digestion

Question 8

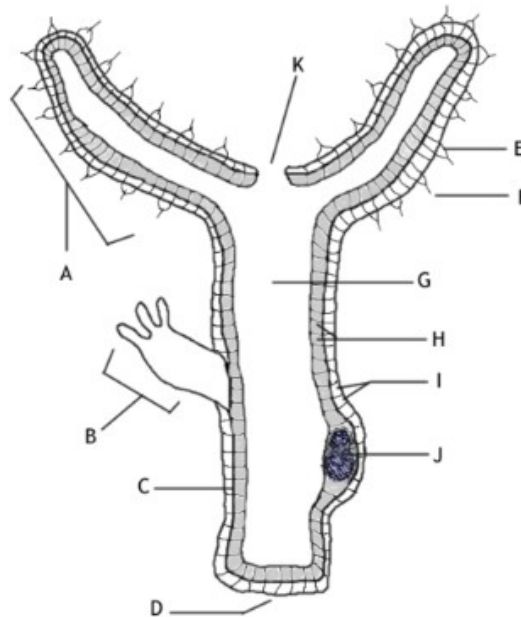
The outermost layer of cells in the body wall of Coelenterata is the

- A. ectoplasm
- B. endoplasm
- C. endoderm
- D. ectoderm



Improve your Skills

Question 1



(<http://www.docstoc.com/docs/4203488/HYDRA-DIAGRAM---DOC>)

- 1.1 Write down the letter which represents the coelenteron. (1)
- 1.2 What type of digestion takes place in this cavity? (1)
- 1.3 What is the disadvantage of having only one opening to the digestive tract? (2)
- 1.4 Identify the part labelled B and state when this structure is produced in the lifecycle of *Hydra*. (2)
- 1.5 What type of nervous system is found in *Hydra*? (1)
- 1.6 What is meant by the term diploblastic?. (1)

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Question 2

- 2.1 Why is the earthworm said to have a through-gut? (2)
- 2.2 What is the nature of an earthworm's food and how is it taken in? (2)
- 2.3 Does the earthworm have an open or closed circulatory system? (1)
- 2.4 Tabulate three differences between an open and a closed blood circulatory system. (6)

Question 3

The phylum Porifera contains the simplest creatures of the animal kingdom. Sponges are aquatic sessile beings (they are not able to move by themselves and they keep themselves attached to substrates), they do not have tissue diversity and their bodies have pores (feature after which their name comes).

- 3.1 Where are sponges found and how do they remain in position in their environment? (2)
- 3.2 Describe the body of a poriferan. (3)
- 3.3 How does water move inside the sponges? (2)
- 3.4 What type of digestion does the porifera exhibit? (1)
- 3.5 How does gaseous exchange occur in sponges? (2)
- 3.6 Do sponges have a nervous system and circulatory system? Explain your answer. (2)

**Links**

- Cnidaria - <http://www.ucmp.berkeley.edu/cnidaria/cnidaria.html>
- Porifera - <http://www.enchantedlearning.com/subjects/invertebrates/sponge/>
- Platyhelminthes - <http://www.ucmp.berkeley.edu/platyhelminthes/platyhelminthes.html>
- Annelida - <http://www.ucmp.berkeley.edu/annelida/annelida.html>
- Mindset LearnXtra - <https://www.mindset.co.za/learn/xtra>