



2.3.1 Student centric methods, such as experiential learning, participative learning and problem solving methodologies are used for enhancing learning experiences


Coordinator,
Internal Quality Assurance Cell,
M.C. College, Barpeta (Assam).


Principal,
Madhab Choudhury College
Barpeta

Group Discussion




Coordinator,
Internal Quality Assurance Cell,
S.C. College, Barpeta (Assam).


Principal,
Madhab Choudhury College
Barpeta

Poster Made by Students



EVOLUTION OF HEART

HIYANGANA DAS
BSC 4TH SEMESTER
ROLL NO-0237
N.C. COLLEGE BARPETA

INTRODUCTION

The heart is an unpaired organ but its origin is bilateral. In an embryo the mesenchyme forms a group of endocardial cells below the pharynx. These cells become arranged to form a pair of thin endothelial tubes. The two endothelial tubes soon fuse to form a single endocardial tube lying longitudinally below the pharynx. The splanchnic mesoderm lying below the endoderm gets folded longitudinally around the endocardial tube. This two-layered tube wall form the heart in which the splanchnic mesoderm thickens to form a myocardium or muscular wall of the heart and an outer thin epicardium or visceral pericardium. The endocardial tube becomes the lining of the heart known as endocardium. Folds of splanchnic mesoderm meet above to form a dorsal mesocardium which suspends the heart in the coelom. Soon a transverse septum is formed behind the heart which divides the coelom into two chambers, an anterior pericardial cavity enclosing the heart and a posterior abdominal cavity. The heart is a straight tube but it increases in length and becomes S-shaped because its ends are fixed. Appearance of valves, contraction, partitions in the heart and differential thickenings in its walls form 2 or 4 chambers in the heart.

FIGURES

FIGURE-1: T.S of embryo showing stages in the development of heart

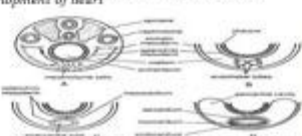


FIGURE-2: Stages in the formation of heart

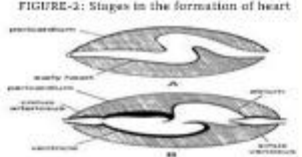


FIGURE-3: Stages in the formation of heart

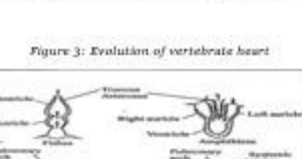


Figure 3: Evolution of vertebrate heart



Figure 4: Evolution of heart chambers in animals



Evolution of Heart Chambers in Animals

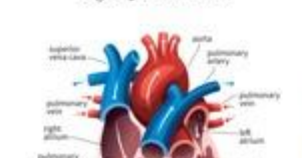


Figure 5: Human heart



DEFINITION

The function of the heart in any organism is to maintain a constant flow of blood throughout the body. This replenishes oxygen and circulates nutrients among the cells and tissues. Following are the main functions of the heart: One of the primary functions of the human heart is to pump blood throughout the body.

EVOLUTION OF HEART IN VERTEBRATES

Single-Chambered Heart in Amphioxus (primitive chordate), a true heart is not found. A part of ventral aorta beneath the pharynx is muscular and contractile and acts as heart.

Two-Chambered Heart in cyclostomes, there are four chambers arranged in a linear order: a thin-walled dorsal ventricle, a highly muscular atrium (auricle), a muscular ventricle and a muscular conus anterior or bulbus cordis. It lies in the body cavity in which other visceral organs are also present. Out of four chambers, only atrium and ventricle correspond to the four chambers (paired atria and paired ventricles) of the higher vertebrates. In the evolution of heart many changes have taken place.

Three Chambered Heart, suspended asymmetrically in which there may be a single atrium with two ventricles or a single ventricle with two atria. In *Amphioxus*, each of the atrial and ventricular walls may be present but are incomplete to prevent a virtual single chamber in addition.

Four Chambered Heart, it has 4 chambers: the left atrium and right atrium (upper chambers), and the left ventricle and right ventricle (lower chambers). The right side of your heart collects blood on its return from the rest of your body.

CONCLUSION

Convergence is the tendency of independent species to evolve similarly when subjected to the same environmental conditions. The primitive blueprint for the heart and circulatory system emerged with the arrival of the third mesodermal germ layer in bilaterians. The heart is an essential, powerful organ that constantly pumps oxygen and nutrients around the body.

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 Coordinator,
 Internal Quality Assurance Cell,
 N.C. College, Barpeta (Assam).


 Principal,
 Madhab Choudhury College
 Barpeta

Power Point Presentation by Students




Coordinator,
Internal Quality Assurance Cell,
M.C. College, Barpeta (Assam).


Principal,
Madhab Choudhury College
Barpeta

Participation in wall magazine preparation



Model presentation by students at a local School




Coordinator,
Internal Quality Assurance Cell,
M.C. College, Barpeta (Assam).


Principal,
Madhab Choudhury College
Barpeta