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**COURSE:** ANA 206- SYSTEMIC EMBRYOLOGY {ORGANOGENESIS}.

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ASSIGNMENT.

Write notes on the following:

I) Development of the lungs

II) Rotation of the stomach and the formation of the Omental bursa

III) Development of the esophagus

ANSWER.

Development of the lungs

The lungs is derived from the primitive gut tube the precursor to the gastrointestinal tract. The gut tube is an endodermal structure which forms when the embryo undergoes lateral folding during the [early embryonic period](https://teachmeanatomy.info/the-basics/embryology/gastrulation/).

At approximately week 4 of development, an outpocketing appears in the proximal part of the primitive gut tube (the foregut) this is known as the respiratory diverticulum**.** Initially, the respiratory diverticulum is continuous with the foregut; but this is not functionally suitable. The formation of a longitudinal ridge known as the tracheoesophagealseptum rectifies this to make the two structures compatible with life. The diverticulum bifurcates into two buds, which become the left and right primary bronchi. The primary bronchi then proliferate to give rise to secondary and tertiary bronchi. Each bronchopulmonarysegment will become a specific portion of the lung, carrying its own tertiary bronchus and branches of the bronchial and pulmonary arteries. During weeks 8-16, the ducts develop within bronchopulmonary segments. Bronchiolar buds branch off from the tertiary bronchi, and begin to proliferate.

At this stage, as there are no alveoli, there isno gas exchange and so the lungs are unable to oxygenate blood. However, the lungs are a metabolically active, developing tissue, which means they are able to remove large amounts of oxygen from the blood. In order to stop the lungs from starving the body of oxygen, the ductus arteriosus shunts blood from the pulmonary artery directly to the aortic arch. This closes at birth in the vast majority of people. During this stage, the lungs resemble the development of tubule-acinous glands hence the name.

Rotation of the stomach and the formation of the Omental bursa

The stomach rotates 90 degrees clockwise around its longitudinal axis, resulting in its left side facing anteriorly and its right side posteriorly. This explains why the left vagus nerve innervates the anterior wall, as it once innervated the left side of the stomach, whereas the **right vagus nerve** innervates the posterior wall, as it once innervated the right side. Concurrent with this rotation, cellular proliferation occurs much faster in the posterior wall of the stomach than in the anterior wall, resulting in the formation of the **greater** and **lesser** **curvatures**, respectively. The stomach also rotates around its antero-posterior axis, resulting in the caudal end {**pyloric part**} to move upward and to the right and the cranial end {**cardiac part**} slightly downward and to the left. Thus, the stomach assumes its final position, with its pylorus located superiorly to the left and its cardia inferiorly to the right. The rotational changes of the stomach also alter the position of the mesenteries. Recall that the stomach is attached to the dorsal and ventral walls through the dorsal mesogastrium and the ventral mesentery {mesogastrium}, respectively. The rotation of the stomach around the longitudinal axis pulls the dorsal mesogastrium to the left and the ventral mesogastrium to the right this creates a space behind the stomach known as the **omental bursa** {lesser peritoneal sac}.

Development of the esophagus

During the third week of gestation, a **respiratory diverticulum** (lung bud) forms as an outgrowth from the ventral wall of the proximal foregut. While the lung bud continues to expand, it becomes separated from the foregut, which forms the esophagus.

Initially, the esophagus is short, but becomes rapidly elongated as a result of the growth and relocation of the [heart](https://www.kenhub.com/en/library/anatomy/heart) and [lungs](https://www.kenhub.com/en/library/anatomy/the-lung).