أهلا وسهلا

الأستاذ الدكتور يوسف حسين

كلية الطب - جامعة مؤتة – الأردن

دكتوراة من جامعة كولونيا المانيا

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The Third week

Prof. Dr. Youssef Hussein Anatomy - YouTube

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Formation of Primitive streak and node

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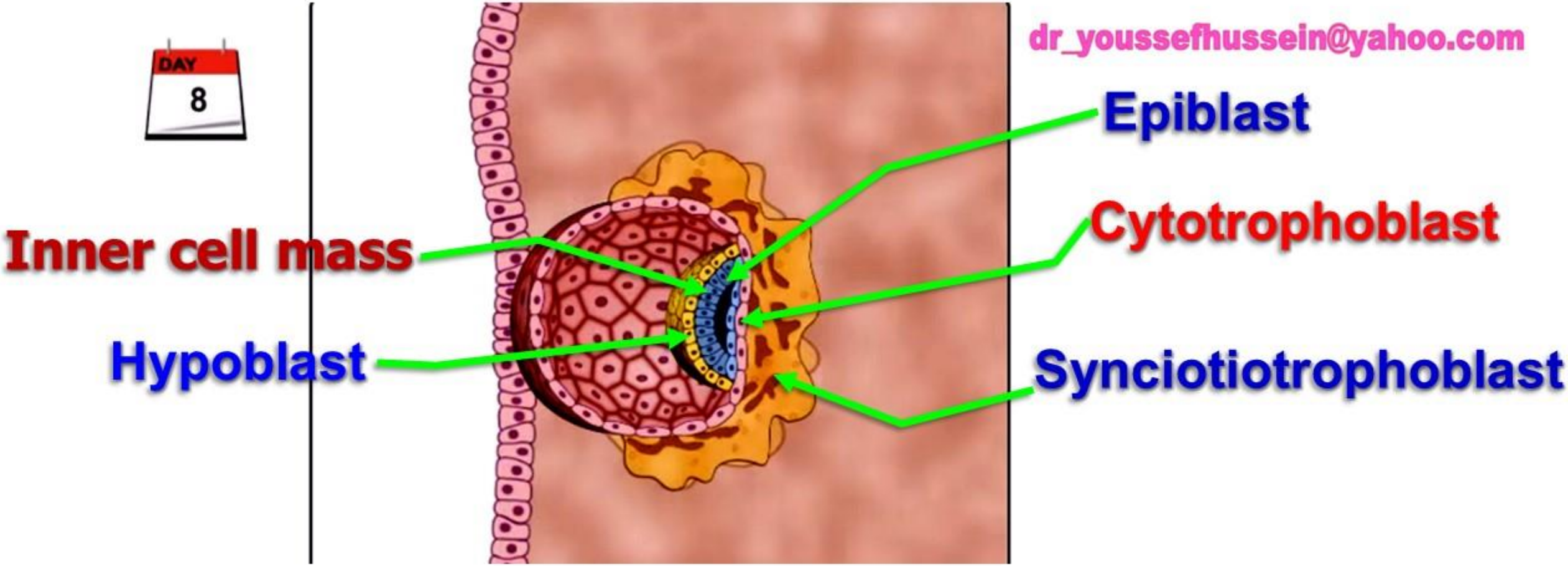


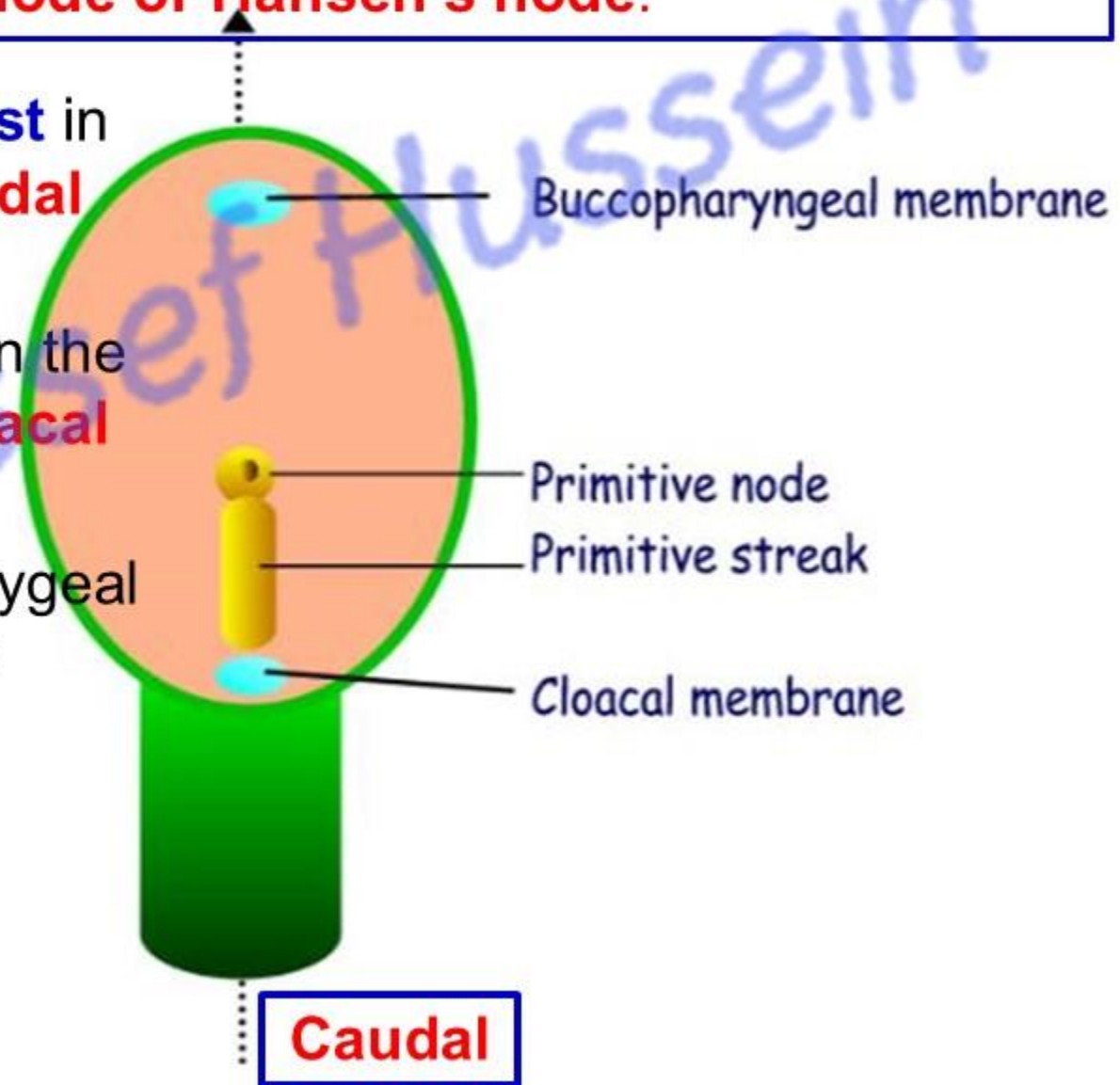
- The inner cell mass (**Embryoblast**) of the blastocyst proliferates and takes shape of flat circular disc.

- The cells are differentiated into 2 layers **(Bilaminar germ disc):**

1. **Dorsal** columnar layer called **epiblast.**
2. **Ventral** cuboidal layer called **hypoblast.**

- **Primitive streak (the 15th day)** is formed by from proliferation of **epiblastic cells** in the midline of the caudal half
- Its cranial end enlarges to form **primitive node or Hansen's node**.

- A circular thickening appears in the **hypoblast** in the midline near cranial end to form **prechordal plate (buccopharyngeal membrane)**
- A circular thickening appears in **hypoblast** in the midline caudal to primitive streak to form **cloacal membrane**
- Remnant of primitive streak in the sacrococcygeal region leading to **sacrococcygeal teratoma**
- **Now, the embryo is pear shape and has**
  - ❖ Cranial and caudal ends
  - ❖ Dorsal and ventral surfaces
  - ❖ Right and left sides.



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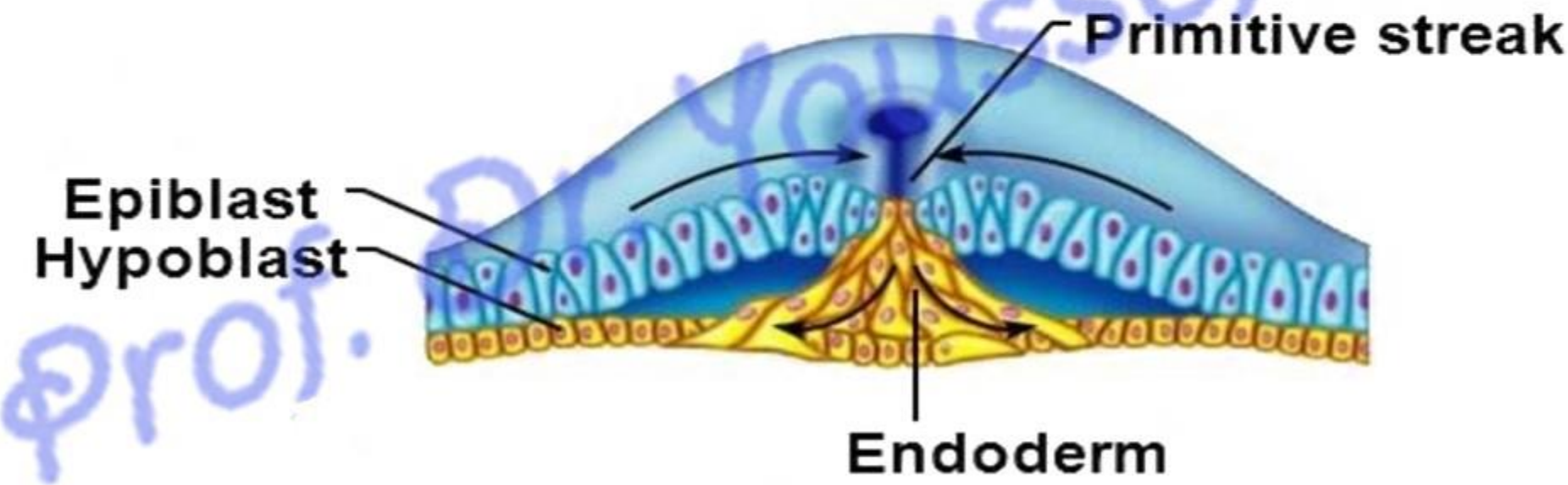
▪ Trilaminar germ disc

➢ Gastrulation

- The bilaminar disc is converted into a trilaminar disc called **Gastrulation**

- **Gastrulation (Trilaminar germ disc)**

- **The first step:** The cells of the epiblastic layer forms the **ectoderm**
- **The second step:** The cells of hypoplastic layer forms the **endoderm**



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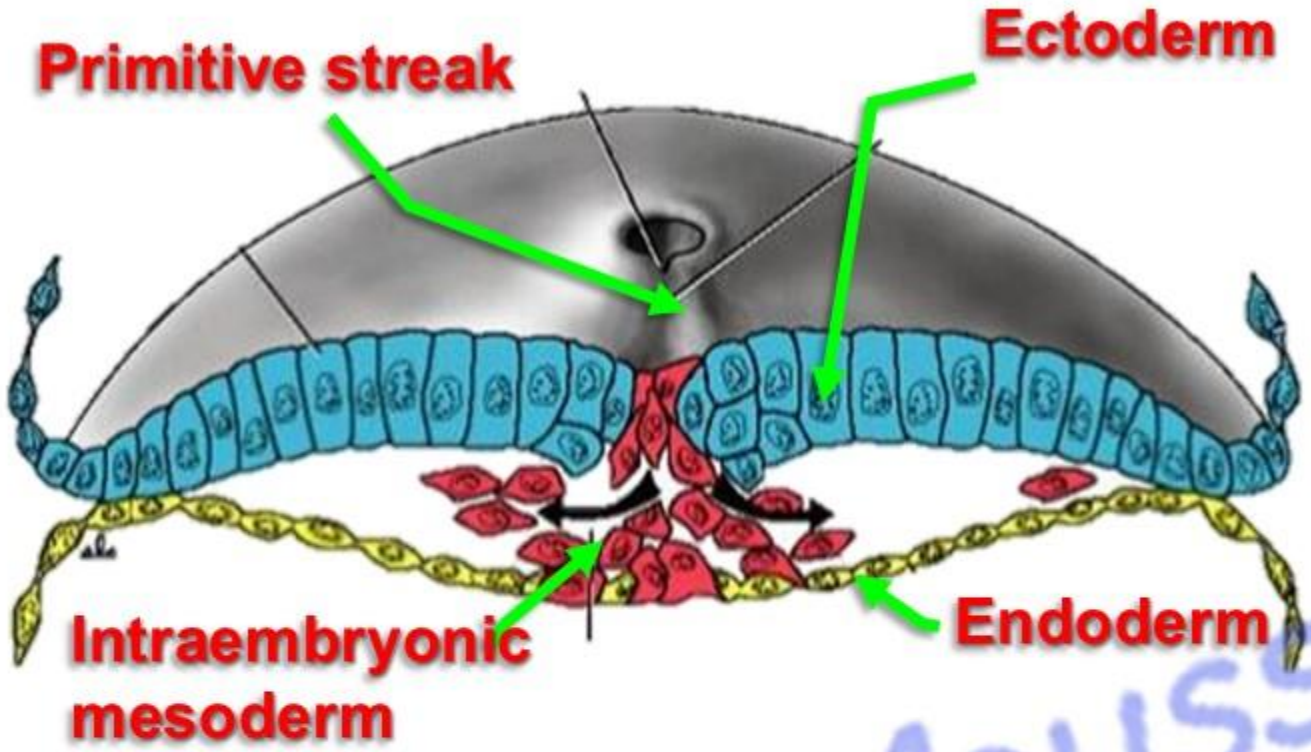

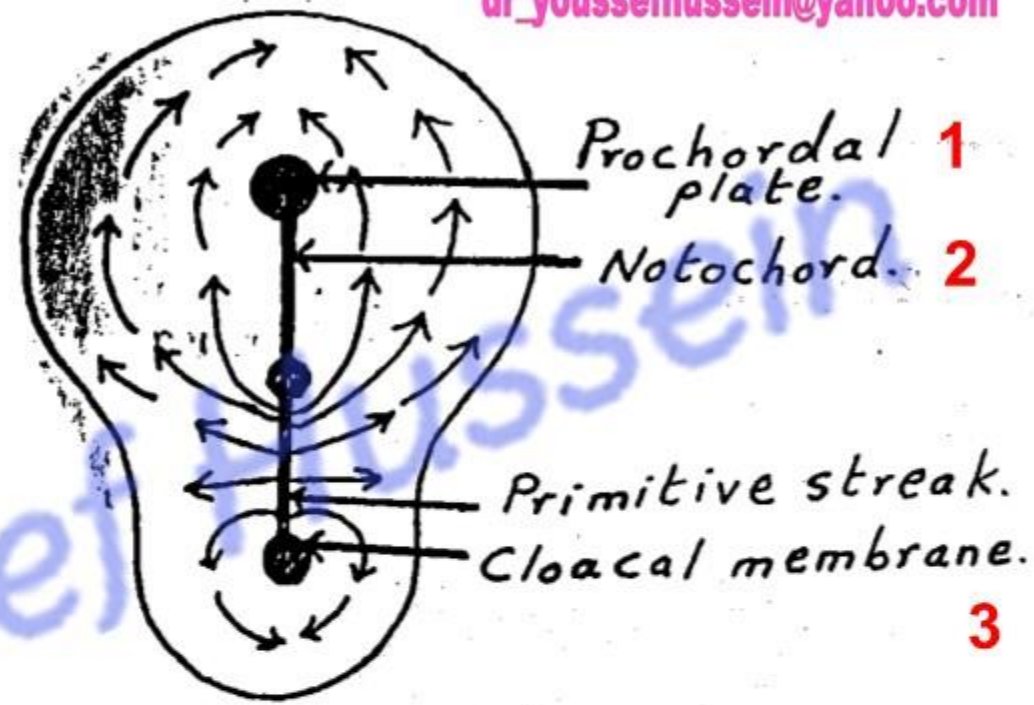

- **The third step: Day 17,** The cells of the **primitive streak** that originated from epiblast, proliferate and migrate in all directions forming layer of cells extending between **ectoderm and endoderm** called **intra embryonic mesoderm (I.M.M.)**
- **By the end of 3rd week,** I.M.M. separate ectoderm from endoderm **except**:

  a- Prechordal plate. b- Notochord c- Cloacal membrane (caudal).

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Formation of Notochord

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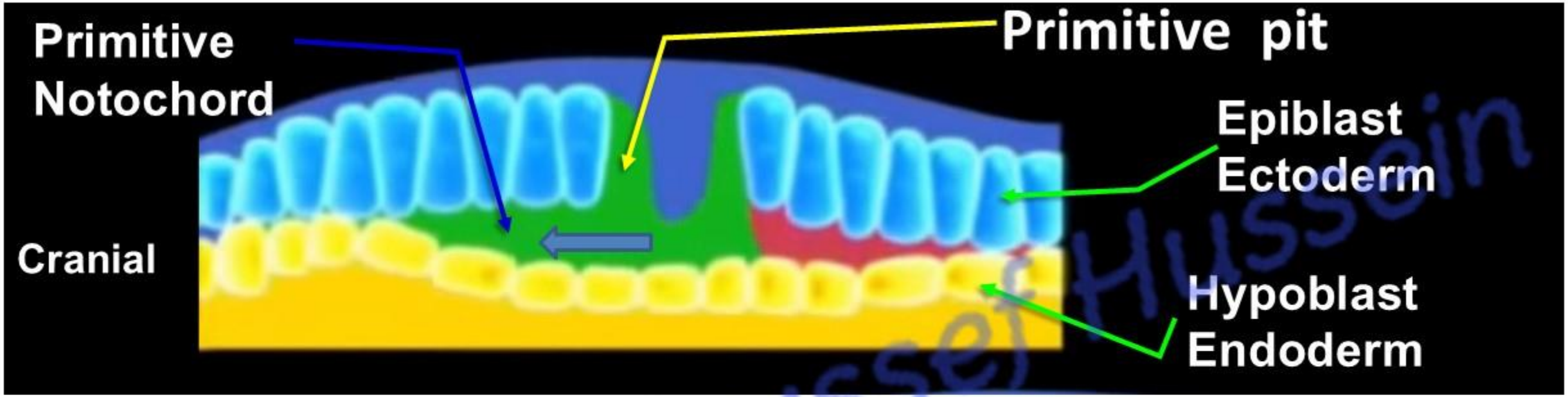
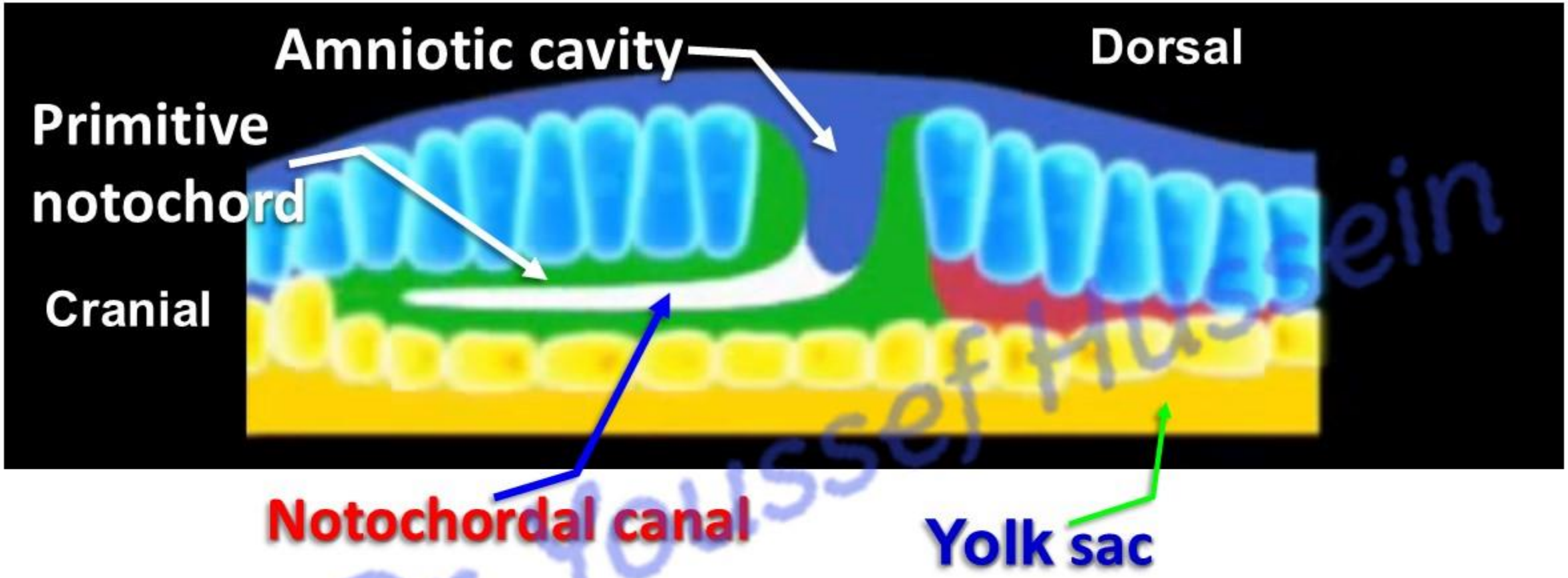
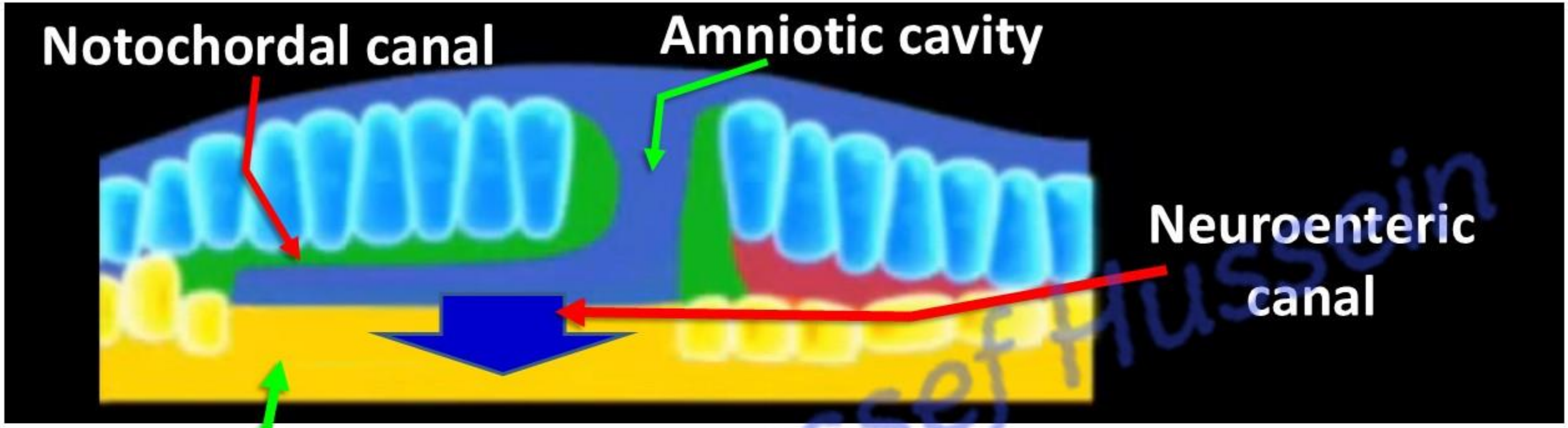


- **Primitive pit** in the primitive node
- The cells of the **primitive pit** proliferate and migrate cranially in the midline between **epiblast** (ectoderm) and **hypoblast** (endoderm) forming **primitive notochord**.
- The notochord stops at prechordal plate (**buccopharyngeal membrane**).



- An **invagination** extends from the **amniotic cavity** into the **primitive pit** then extends into **primitive notochord** forming **the notochordal canal.**



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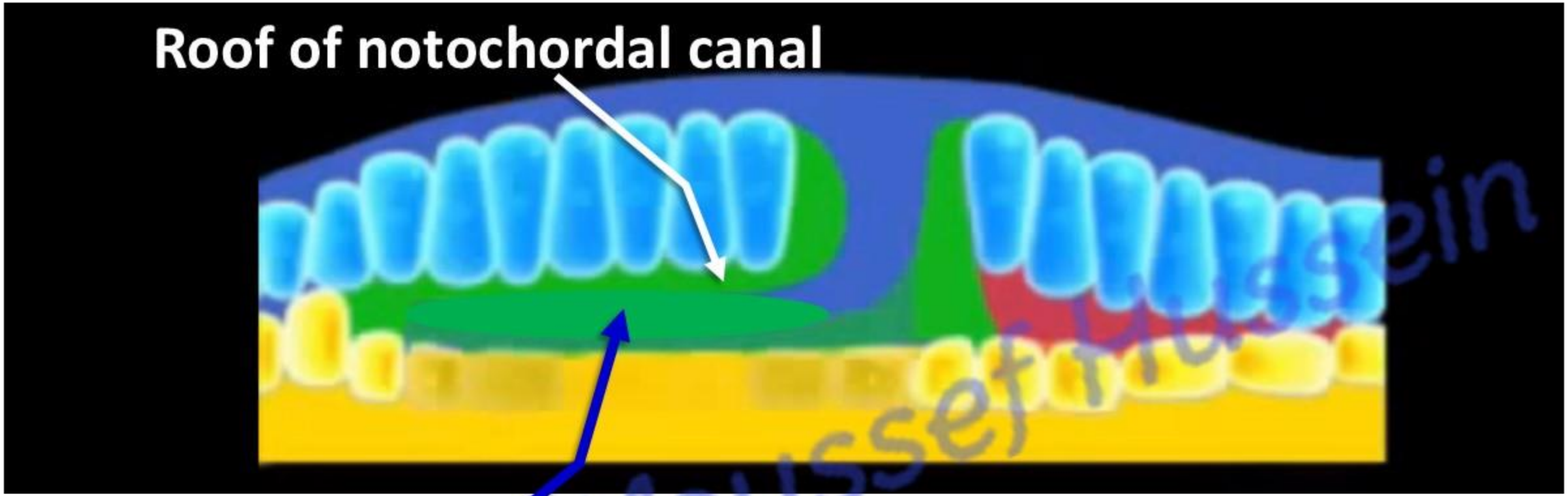
- **Degeneration** of the **floor of the notochordal canal** and **roof of the yolk sac leading to formation of neuroenteric canal**.
- As the result, a **temporarily communication** of the amniotic cavity (dorsal) and the yolk sac (ventral)
- The canal maintains and adjusts the pressure between amniotic cavity and yolk sac



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- The cells of the roof of the notochordal canal proliferate and close the notochordal canal forming the definitive notochord.

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• Functions of notochord

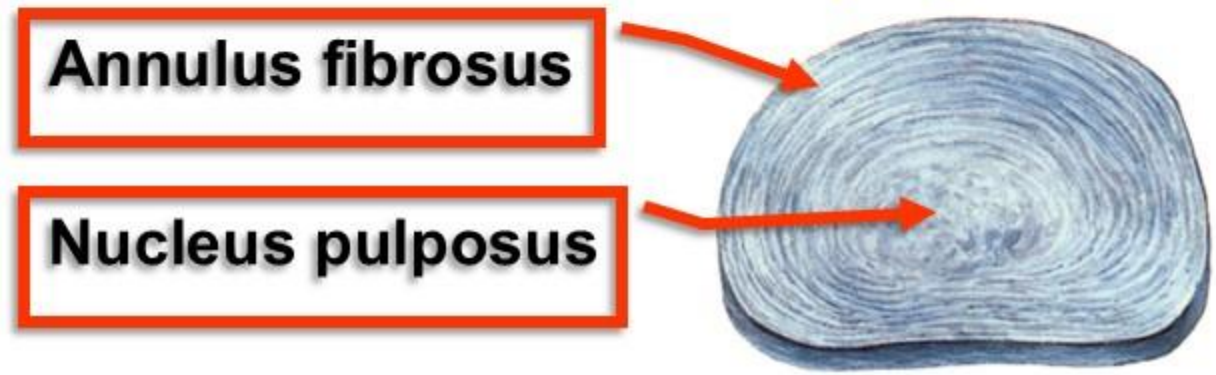
1. It forms **axis skeleton of the embryo** before development of the vertebral column.
2. It secrets signals to stimulate development of **somites** from **mesoderm**.
3. It secrets signals to stimulate development of **neural tube from ectoderm**.

• Fate of notochord

- **Degeneration and disappears** inside bodies of the vertebrae
- The part between the bodies of vertebrae forms the **nucleus pulposus** of the **intervertebral discs**
- Cellular remnants of notochord

give rise to tumors called **Chordoma**

In the axial skeleton



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Thank you

Questions

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