

وسهلا

أهلا



# الأستاذ الدكتور يوسف حسين

أستاذ التشريح وعلم الأجنة - كلية الطب - جامعة الزقازيق - مصر

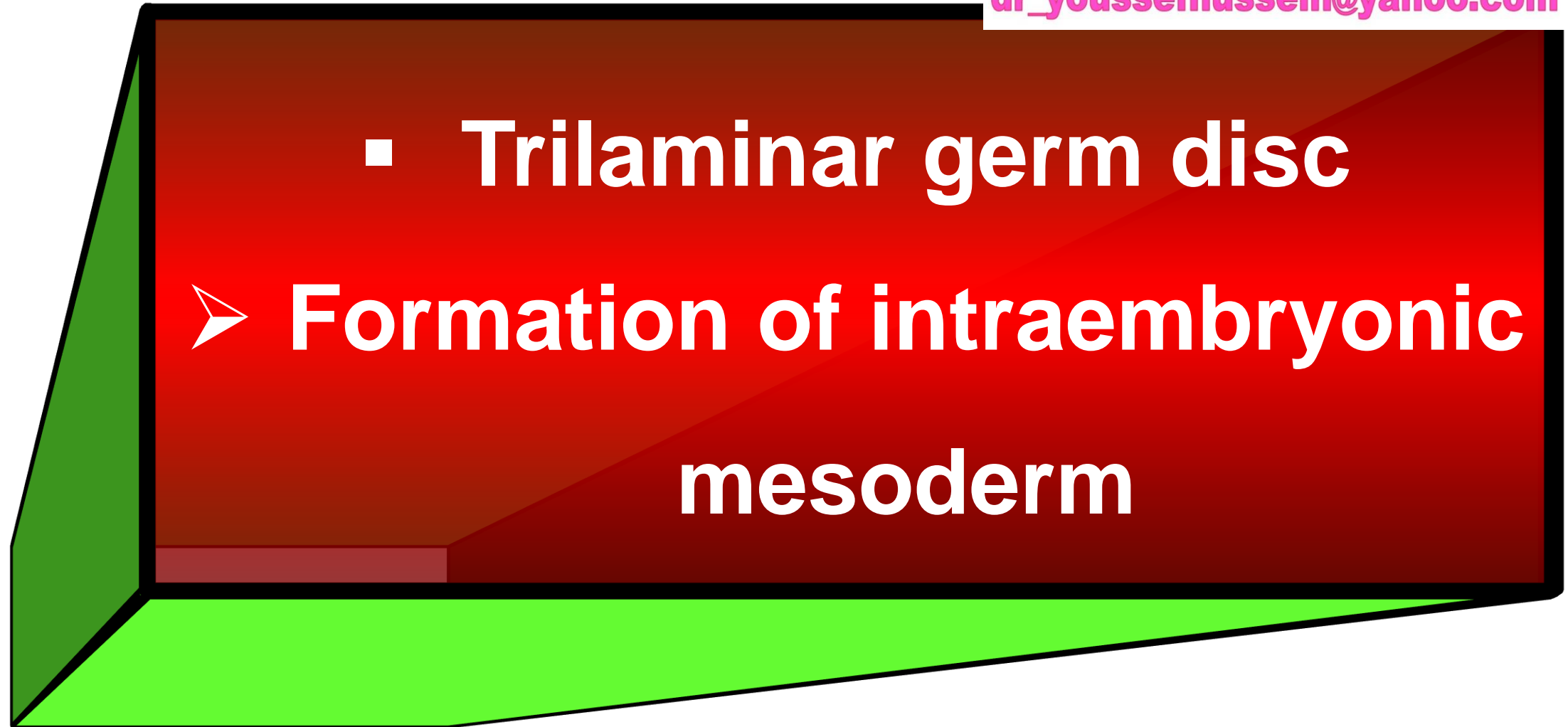
رئيس قسم التشريح و الأنسجة و الأجنة - كلية الطب - جامعة مؤتة - الأردن

دكتورة من جامعة كولونيا المانيا

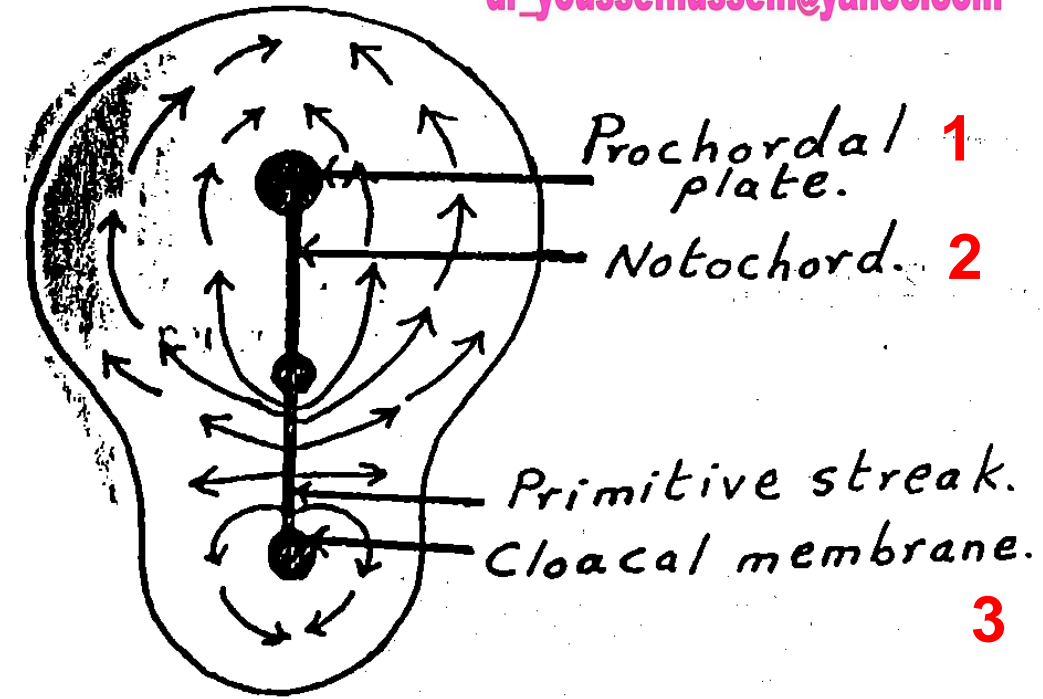
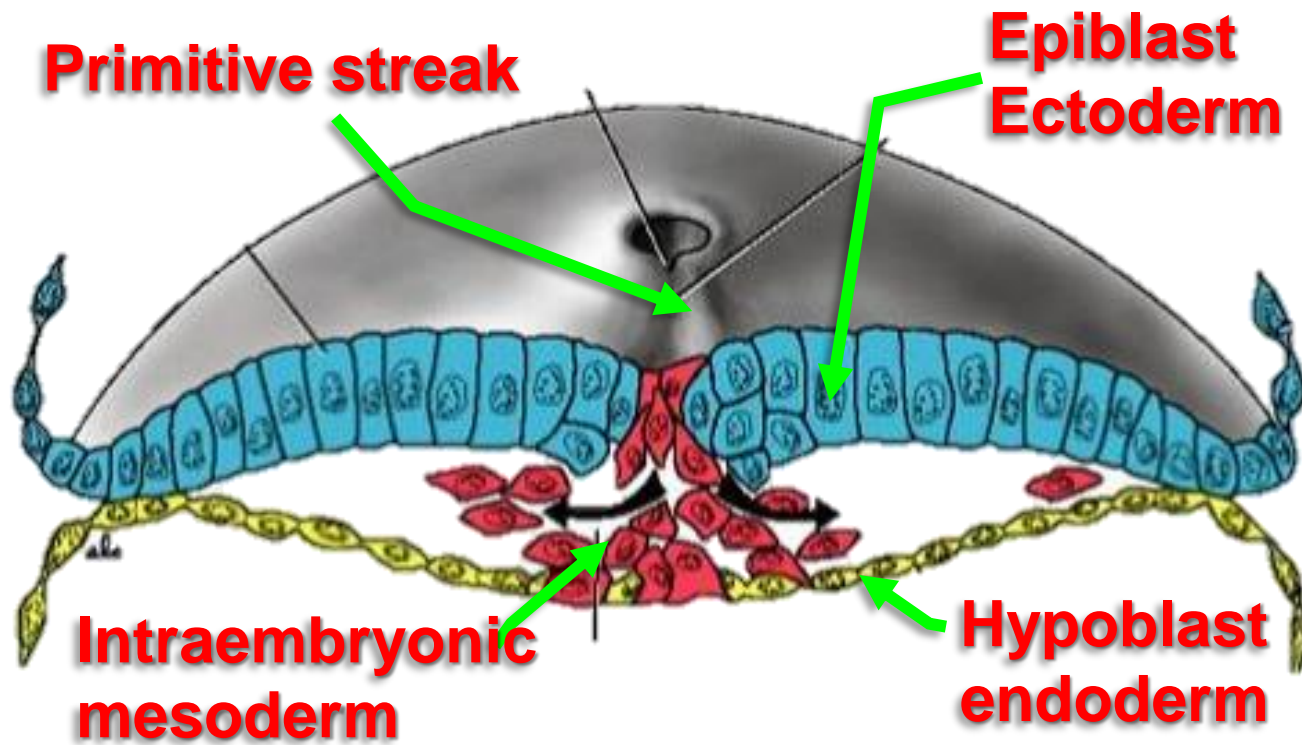
**Dr. Youssef Hussein Anatomy** اليوتيوب

جروب الفيس د. يوسف حسين (استاذ التشريح)

# The third week

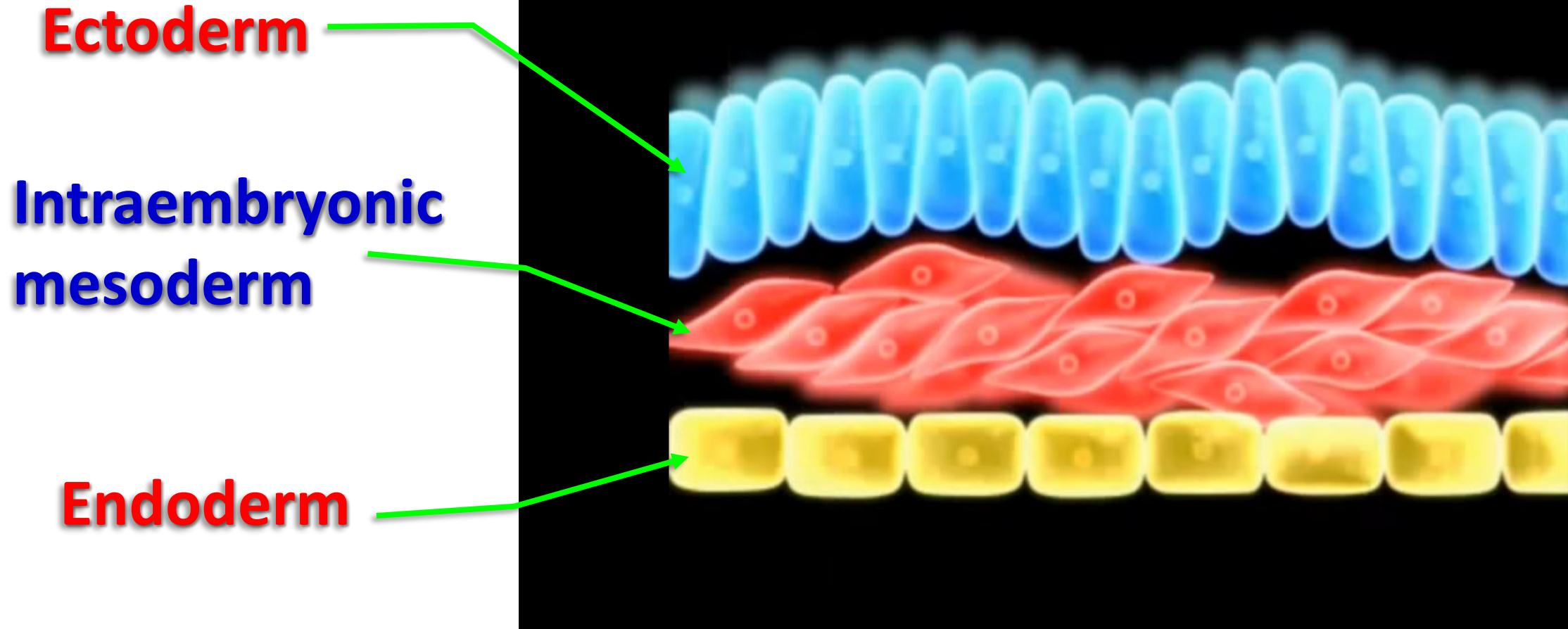


- **The bilaminar disc is converted into a trilaminar disc called **Gastrulation****



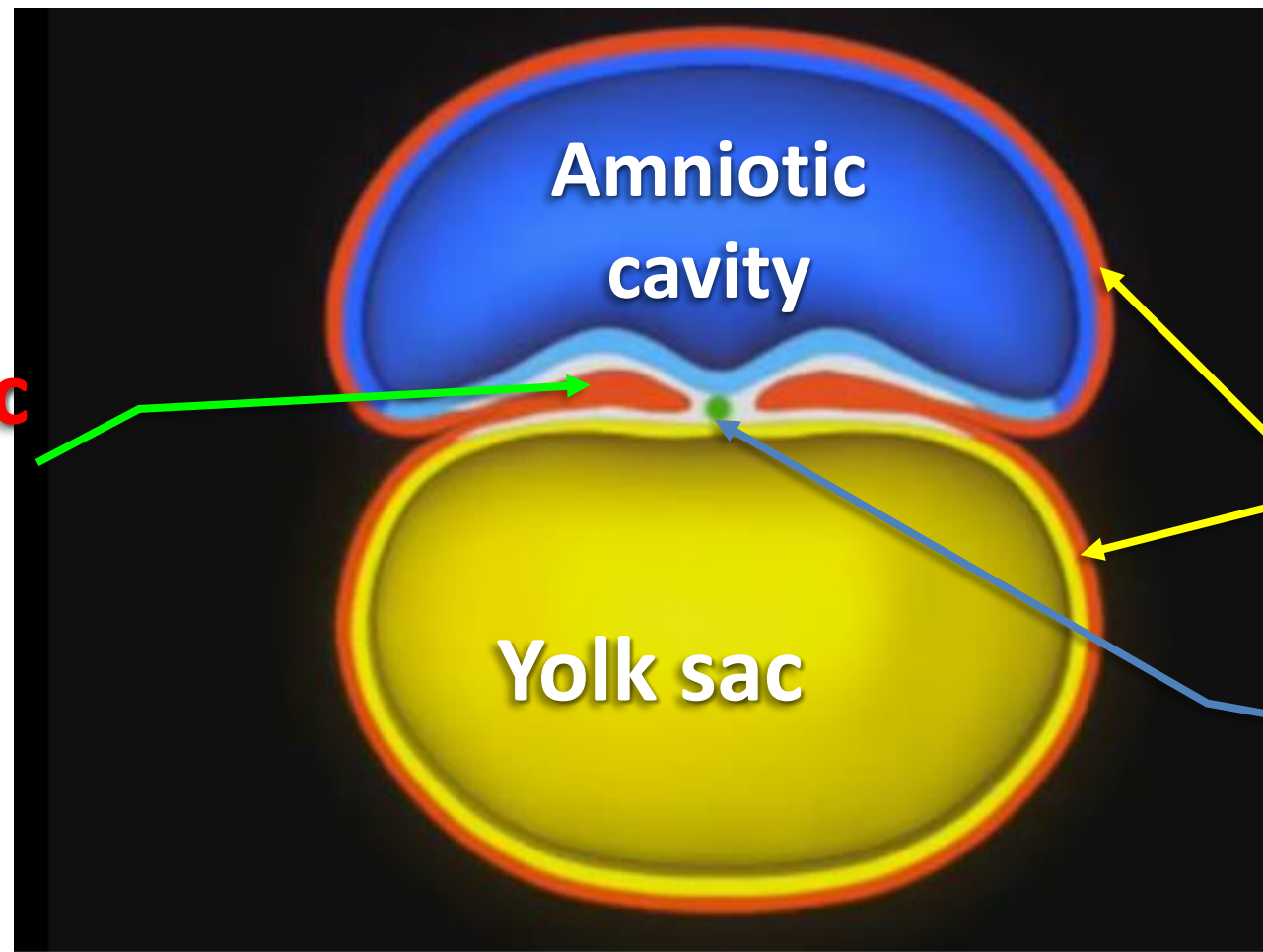
- **Day 17**, The cells of the **primitive streak** (originate from epiblast) proliferate and migrate in all directions forming layer of cells extending **between the epiblast (ectoderm) and hypoblast (endoderm)** called **intra embryonic mesoderm (I.M.M.)**
- **By the end of 3<sup>rd</sup> week**, I.M.M. separate ectoderm from endoderm **except**:
  - a- Prechordal plate. b- Notochord c-.Cloacal membrane (caudal).

# Trilaminar Embryonic Disc



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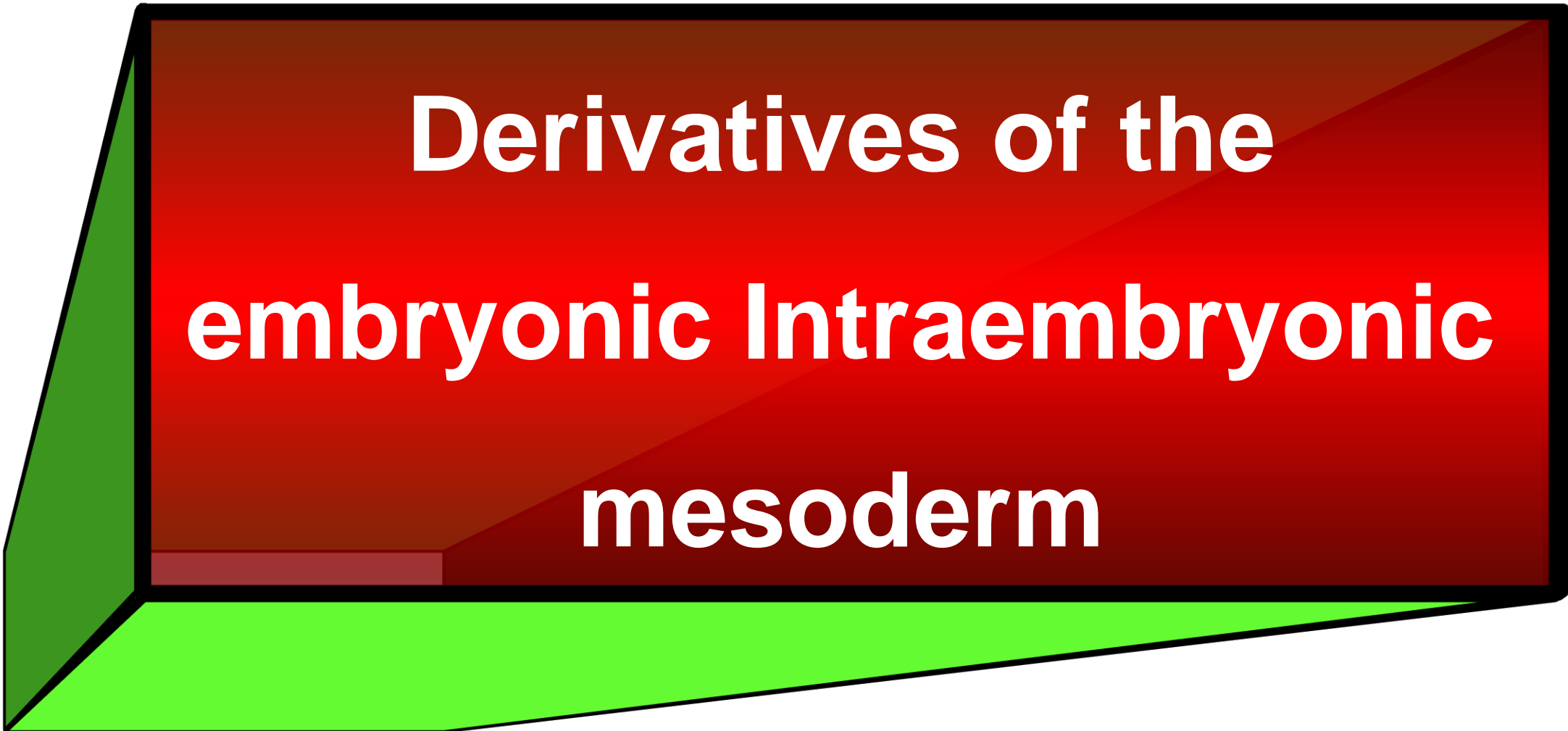
**Intraembryonic  
mesoderm**



**extraembryonic  
mesoderm**

**Notochord**

- **Intraembryonic mesoderm** contacts with **extraembryonic mesoderm** that covering the yolk sac and amniotic cavity



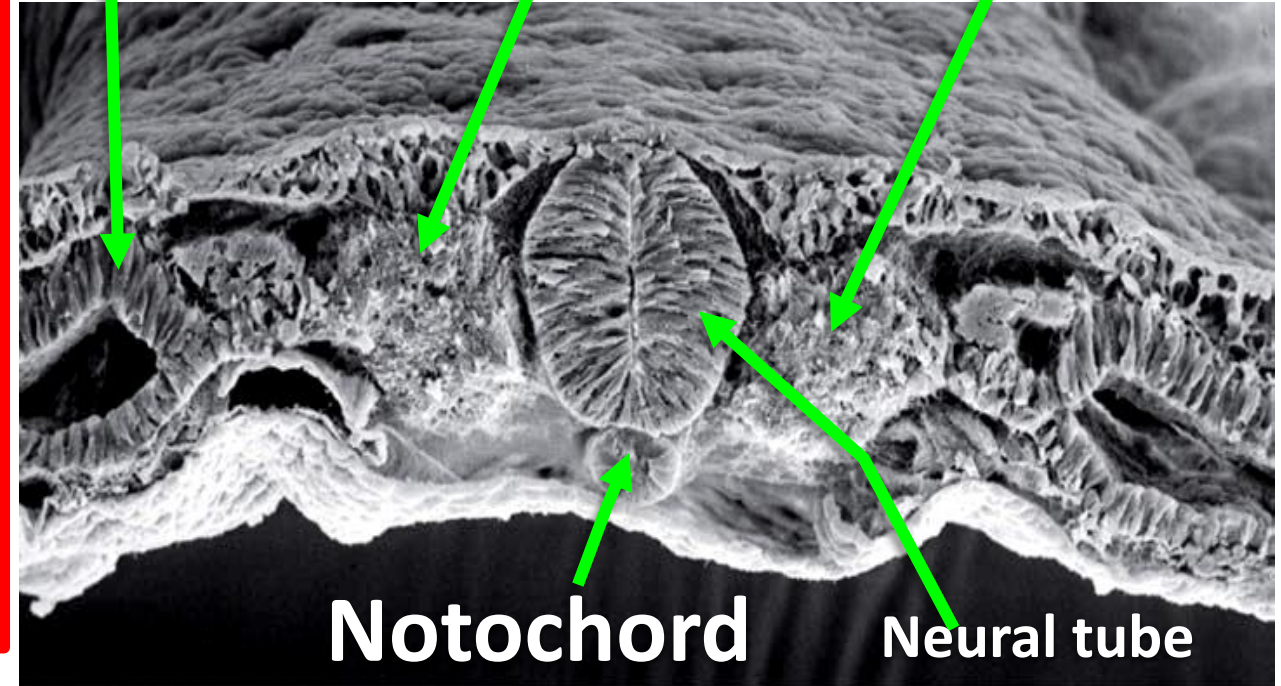
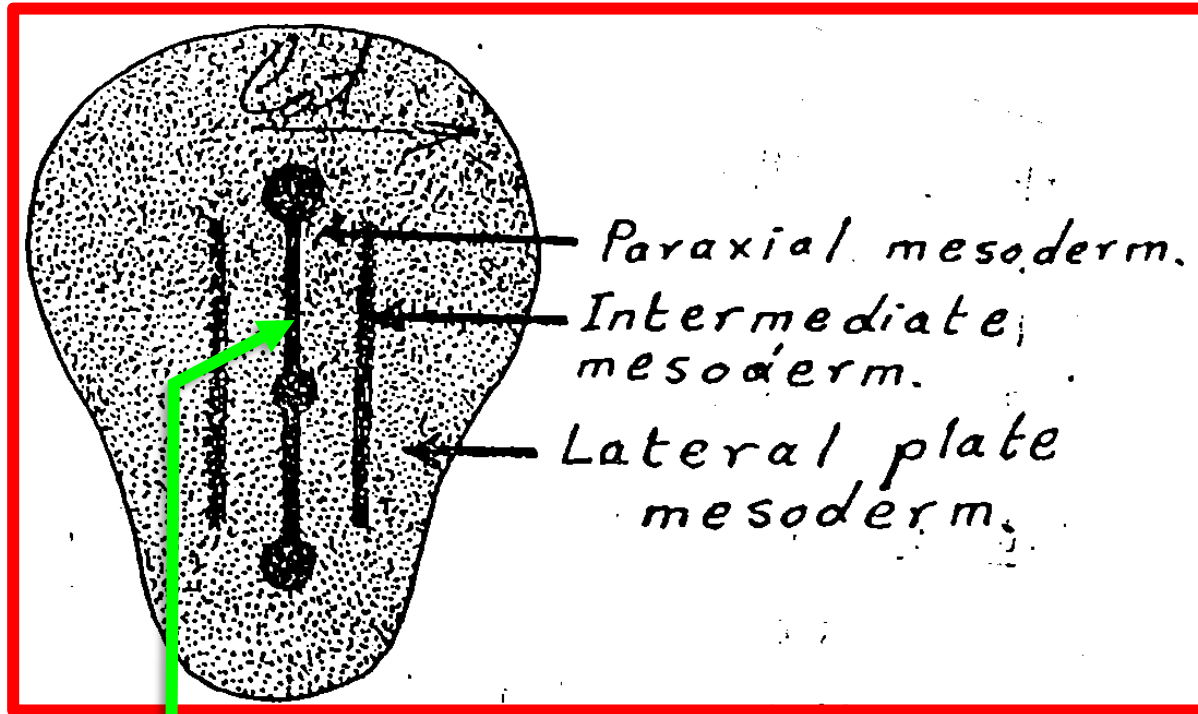
**Derivatives of the  
embryonic Intraembryonic  
mesoderm**

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Lateral plate mesoderm

Intermediate mesoderm

Paraxial mesoderm



Notochord

Neural tube (ectoderm)

- The intraembryonic mesoderm on each side of the notochord is differentiated into 3 parts: medial (paraxial mesoderm), intermediate mesoderm and lateral plate mesoderm



➤ **Derivatives of the  
embryonic Medial  
(paraxial) mesoderm**

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**Dorsal**

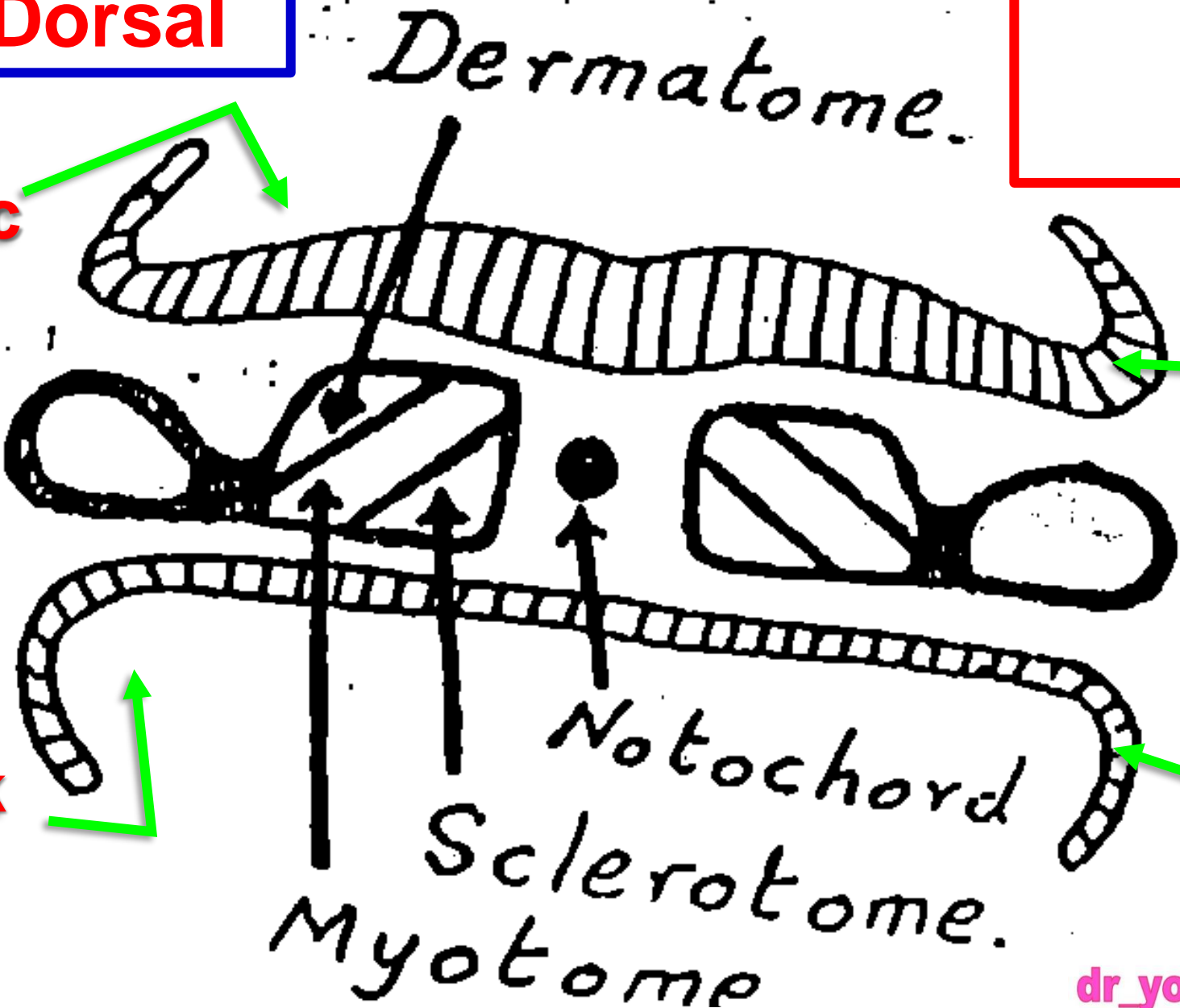
▪ **Medial (paraxial) mesoderm (Somites)**

**Amniotic cavity**

**Ectoderm**

**2dry yolk sac**

**Endoderm**



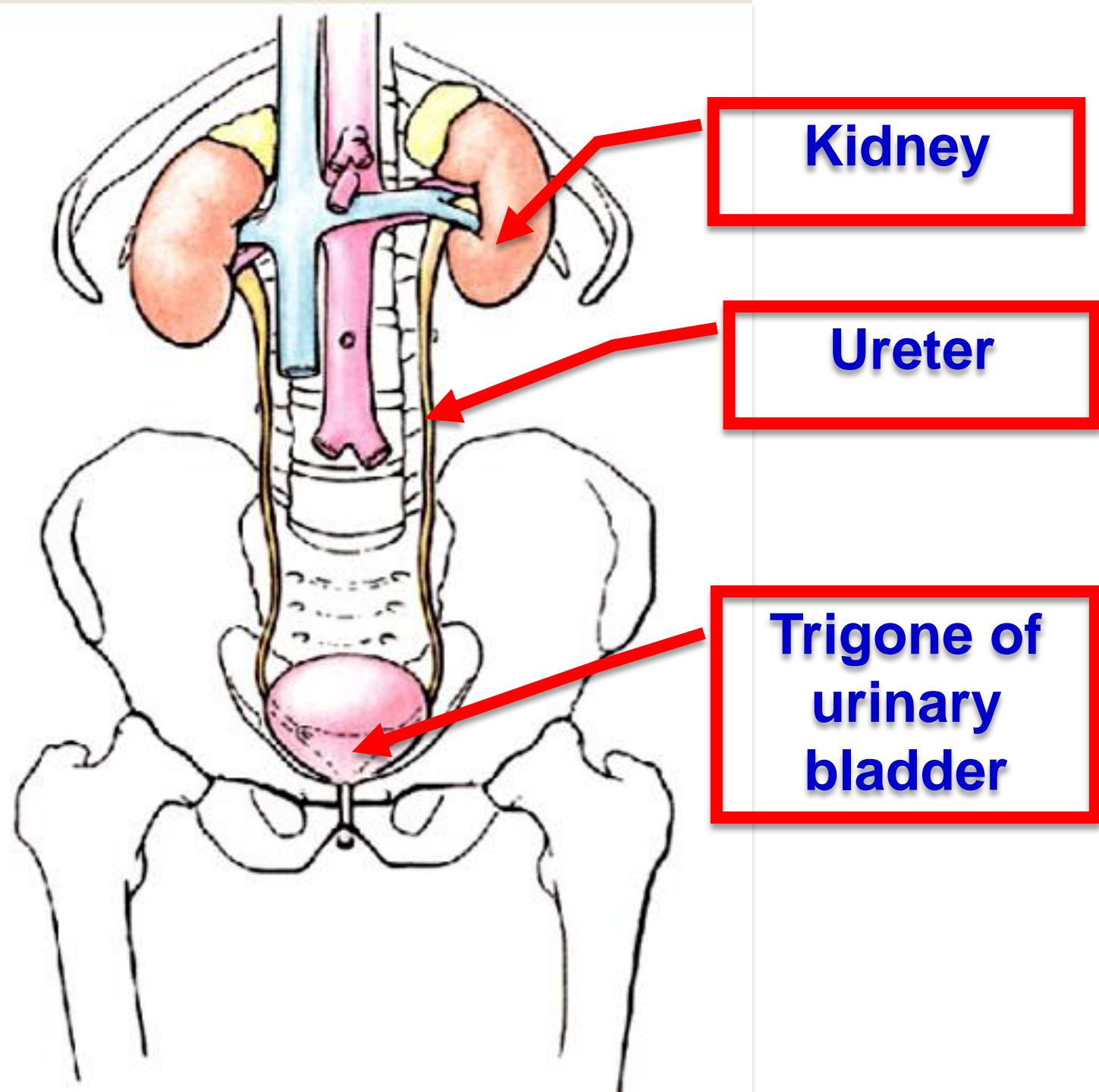
## ➤ Derivatives of the medial (paraxial) mesoderm

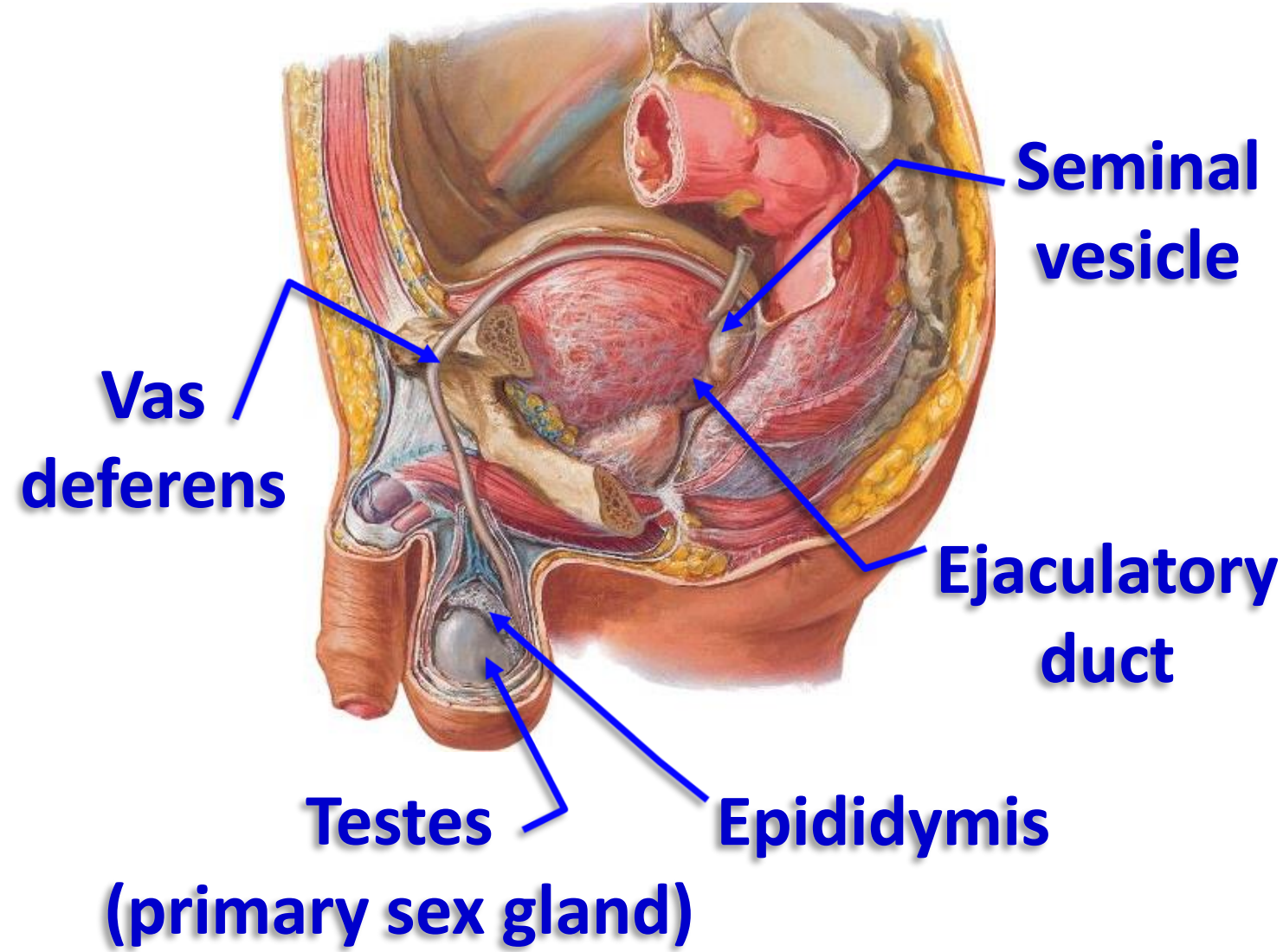
- The **paraxial mesoderm** is divided into cubical masses called **somites**.
- The end of 5<sup>th</sup> week, These masses are 42-44 and are arranged as
  - **4 Occipital**, **8 Cervical**, **12 Thoracic**, **5 Lumbar**, **5 Sacral** & **8-10 Coccygeal**.
- Later on the 1<sup>st</sup> occipital and the last 5-8 coccygeal **degenerate**.
- **Each somite divides into 3 parts:**
  - 1. Ventromedial part (sclerotome):** gives bones of the axial skeleton (vertebrae, and ribs) and bones of the base of the skull.
  - 2. Intermediate part (myotome):** gives rise to the skeletal muscles of the trunk, limbs and (occipital myotomes gives muscles of the tongue ).
  - 3. Dorsolateral part (dermatome):** gives rise to the dermis and subcutaneous tissue of the skin.

➤ **Derivatives of the  
embryonic Intermediate  
mesoderm**

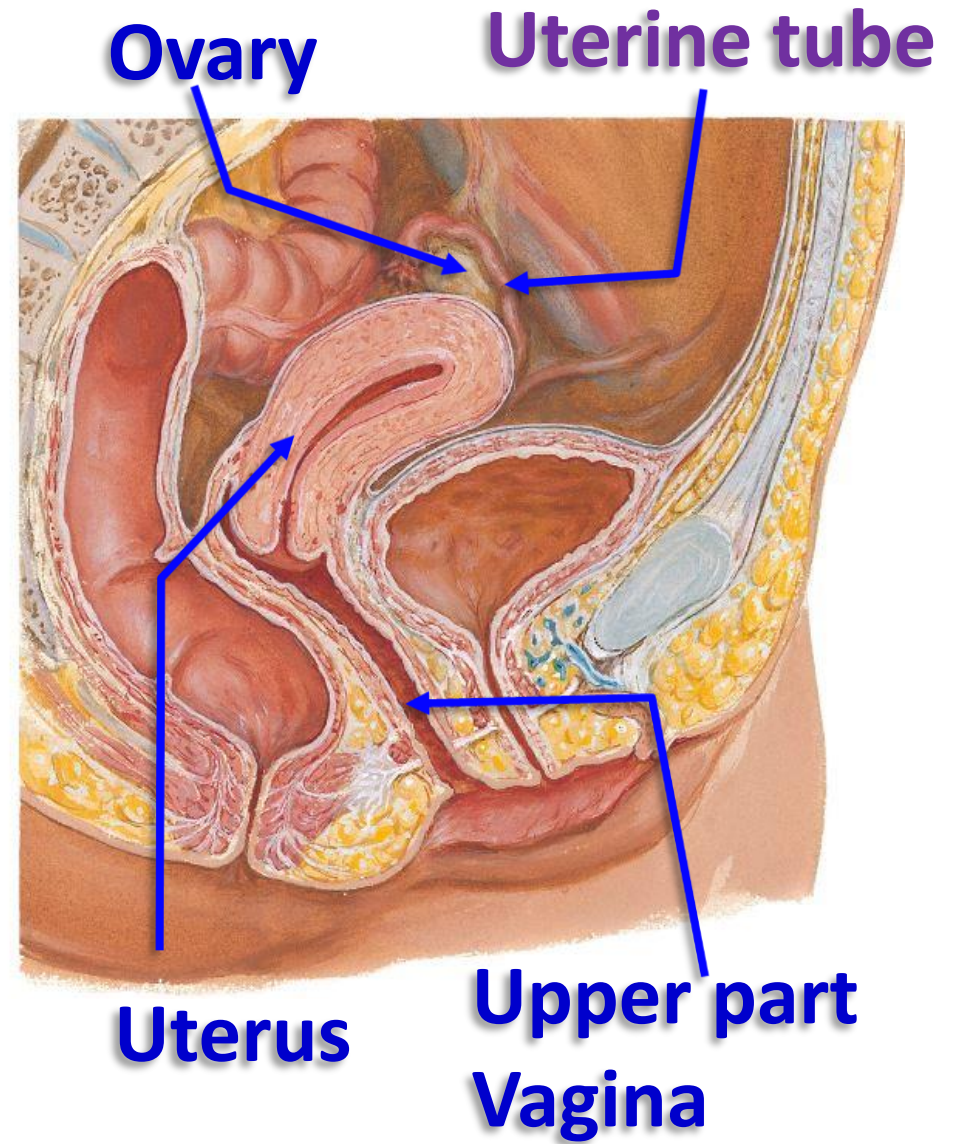
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- **Derivatives of the intermediate mesoderm**
- **Gives most of the urogenital system**





**Male Reproductive System**

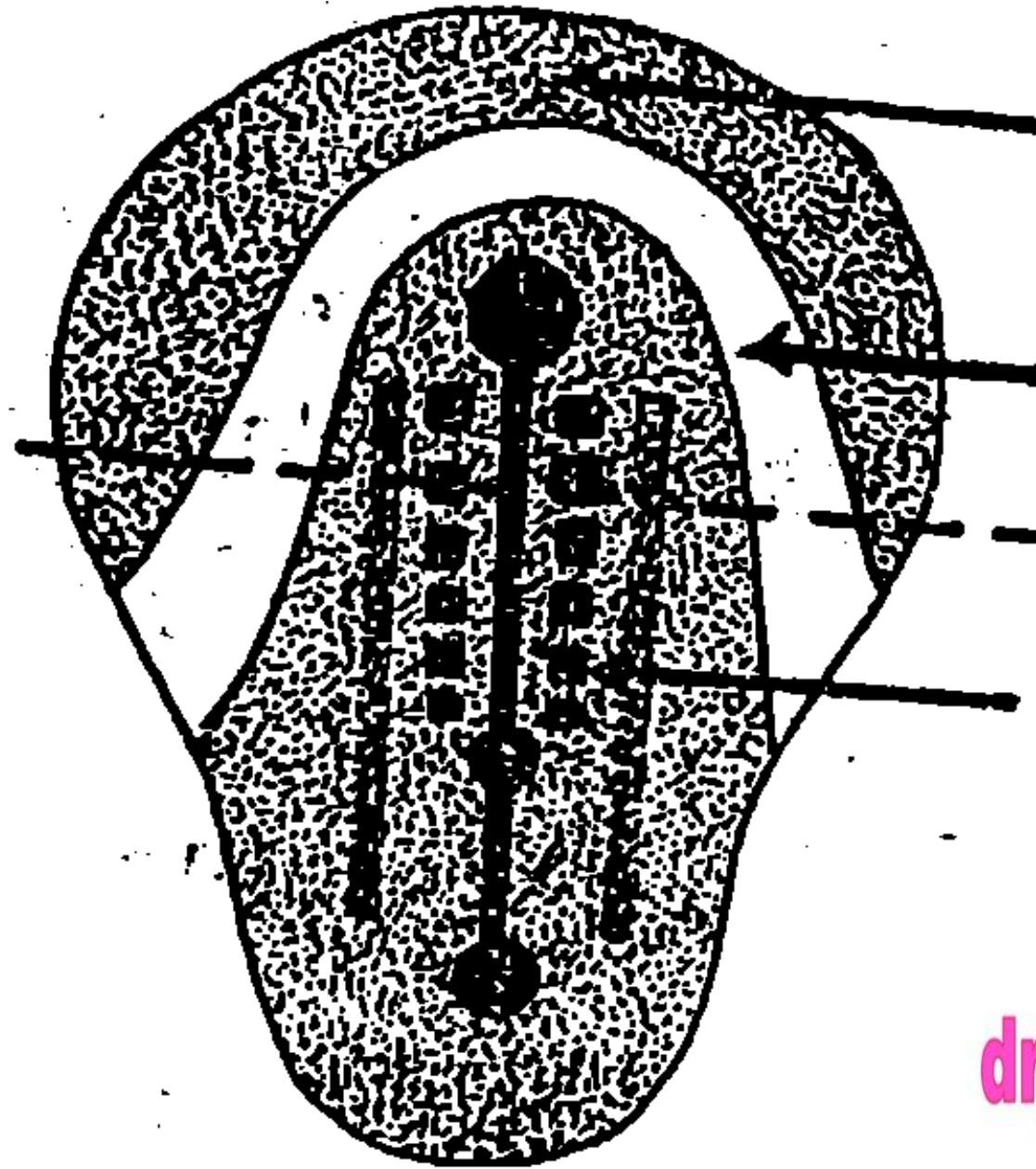


**Female Reproductive System**



➤ **Derivatives of the  
embryonic Lateral  
mesoderm**

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Transverse  
septum.

Intraembryonic  
coelom.

Somite.

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➤ **Derivatives of the lateral mesoderm** [dr\\_youssefhussein@yahoo.com](mailto:dr_youssefhussein@yahoo.com)

- A single U-shaped cavity **intraembryonic coelom** in the lateral **intraembryonic** mesoderm.
- It divides the lateral mesoderm into **2 layers outer parietal (somatic) layer** and **inner visceral (splanchnic) layer**, It forms three cavities (**p**ericardium, **p**leura and **p**eritoneum).
- **The mesoderm in front the oral membrane** gives cardiovascular system (heart and blood vessels).
- **The mesoderm in the region of the developing neck: 6 pharyngeal arches** and their derivatives.
- **The mesoderm all over the body** gives bones, muscles, joints, ligaments and blood vessels.
- **Septum transversarium** forms the central tendon of diaphragm



➤ **Derivatives of the  
embryonic Ectoderm**

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➤ **Neural tube**, dorsal to notochord, gives central nervous system (brain & spinal cord).

➤ **Inner ear**

➤ **DERIVATIVES OF THE NEURAL CRESTS**

➤ A special neuroectodermal cells dorsolateral to the neural tube.

1- Sensory Cells of the **para-sympathetic ganglia** ((Ciliary of 3rd, pterygopalatine and submandibular of 7th, Otic of 9th and enteric ganglia of 10th cranial nerves) )

2- Sensory Cells of the **sympathetic ganglia**

3- Sensory Cells of the **dorsal root ganglia of the spinal nerves**

4- **Pia and arachnoid matters** of the meninges (dura matter mesodermal in origin).

5- **Schwann cells** that form the myelin sheath around nerve axon

6- **Chromaffin cells** of the suprarenal medulla (cortex is mesoderm)

7- **Pigment cells** in the skin, iris and retina.

## ➤ **Surface ectoderm**

- **Skin** (hairs, nails and its glands).
- **The lining of all orifices that open in the skin**
  - **Eye**, lacrimal gland and nasolacrimal duct.
  - **Nose** and paranasal sinuses.
  - **Oral cavity**, and salivary glands.
  - **External auditory meatus** and outer surface of the ear drum.
  - **Lower 1/2 of the anal canal.**
  - **Terminal part of the male urethra** in glans penis .

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➤ **Derivatives of the  
embryonic Endoderm**

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## ➤ Derivatives of the endoderm

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- **Mucous membrane of the tongue.**
- The epithelial lining of **gastro-intestinal tract** except the lower 1/2 of the anal canal oral cavity, and salivary glands (Ectoderm).
- **The liver cells, hepatic ducts and bile ducts.**
- **Ducts and acini of the pancreas.**
- The epithelial lining of **Respiratory system** except Nose and paranasal sinuses (ecto).
- The epithelial lining of **Middle ear**, Eustachian tube and mastoid antrum.
- The epithelial lining of **Urinary bladder** (except trigone mesoderm)
- The epithelial lining of **female urethra**
- The epithelial lining of **male urethra** except part in glans penis (ectoderm)
- **Prostate** and bulbourethral glands
- **Lower part of the vagina** and Vestibular gland and
- **Cells of thyroid, parathyroid and thymus glands.**
- **Palatine tonsils**

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