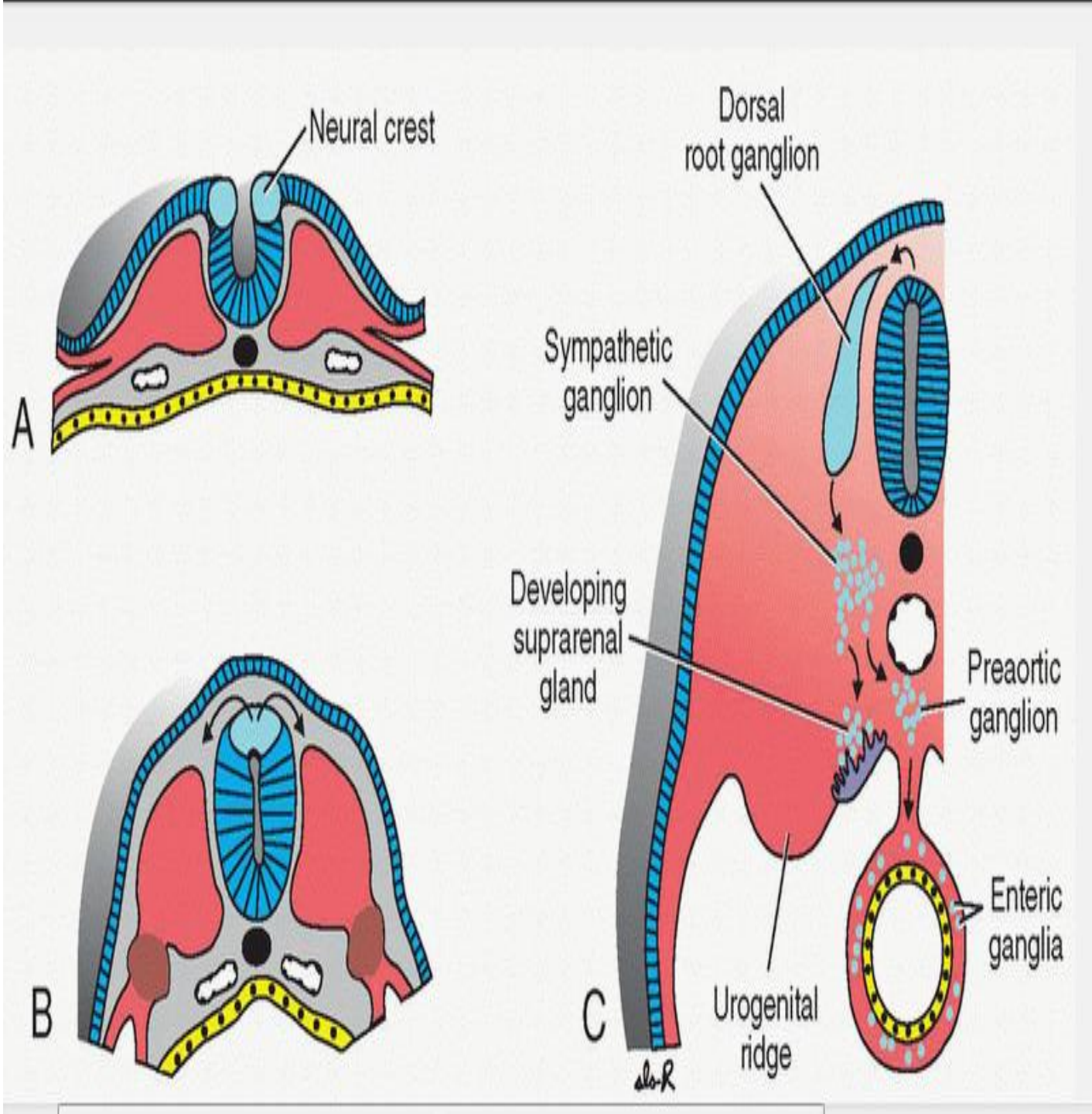

بسم الله الرحمن الرحيم


لا إله إلا الله محمد رسول الله

## DEVELOPMENT OF SOMITES

The paraxial mesoderm differentiates, condenses, and begins to divide into paired **cuboidal bodies,the SOMITES,** which form in craniocaudal sequence.

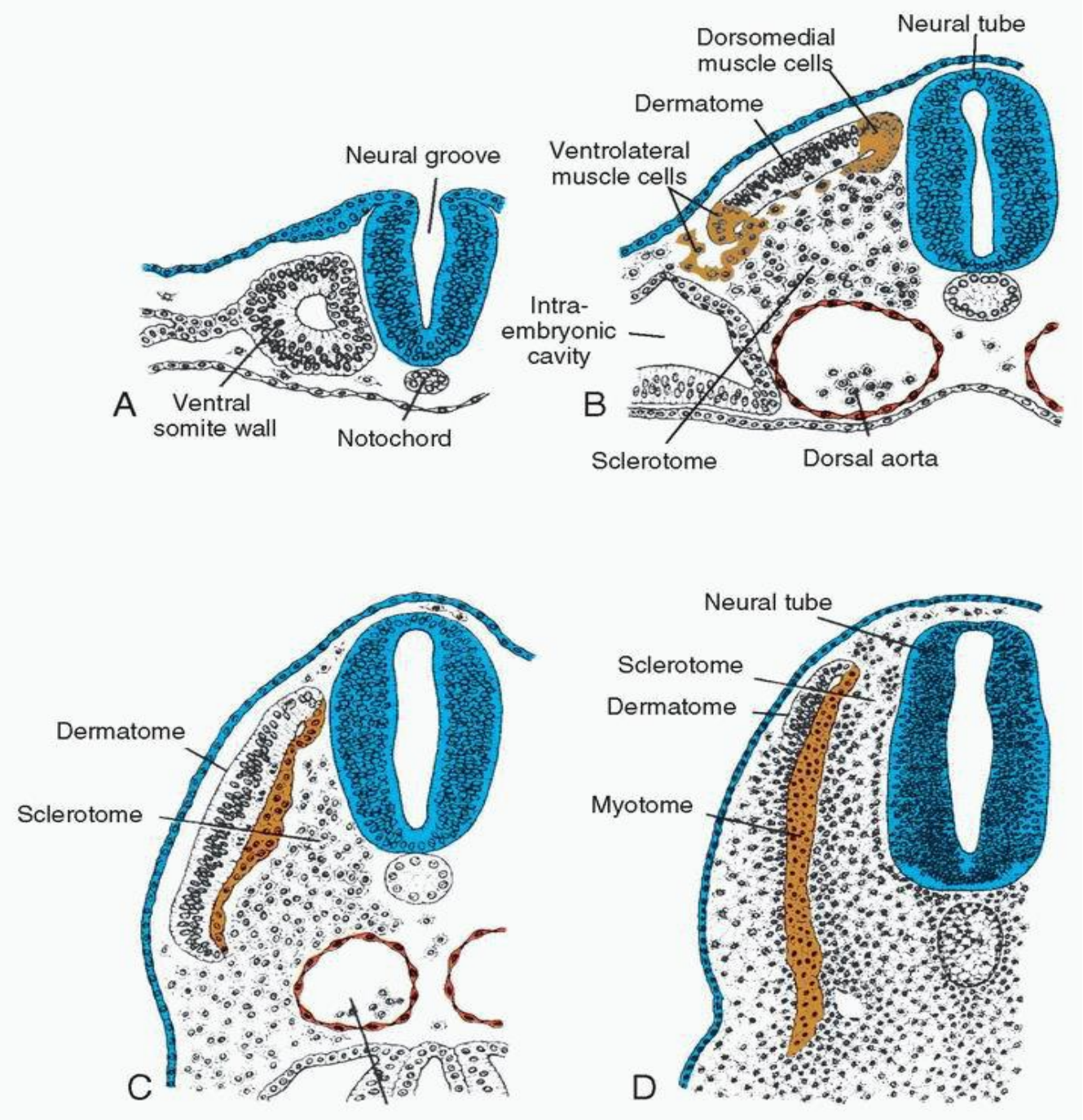


# Somite Differentiation

**Sclerotome** that will differentiate into the vertebrae and ribs .

**Dermomyotome**

Cells in the dermomyotome ultimately form dermis and muscles for the back, body wall and limb.



About **38** pairs of somites form during the somite period of human development (DAYS 20 TO 30).

By the end of the **fifth week**, **42 to 44** pairs of somites are present.

The somites are also used as one of several criteria for determining an **embryo's age.**

1. Somites develop craniocaudally and give rise to most of the axial skeleton and associated musculature as well as to the adjacent **dermis** of the skin.
2. The first pair of somites appears at the end of the third week a short distance caudal to the site at which the otic placode forms.
3. Subsequent pairs form in a **craniocaudal sequence.**

- From the occipital region caudally, somitomeres further organize into **somites.**
- The first pair of somites arises in the occipital region of the embryo at approximately the **20th** day .
- From here, new somites appear in craniocaudal

Form at a rate of three pairs per day until, at the end of the fifth week, **42 to 44** pairs are present.

Occipital-------- **04**

Cervical--------- 08

Thoracic------- 12

Lumbar-------- 05

Five sacral---- 05

Coccygeal pairs------08-10

**First occipital and the last five to seven coccygeal somites later disappear**

**Remaining somites form the axial skeleton and all of the muscles.**

# DERIVATIVES OF THE MESODERMAL GERM LAYER

Form a thin sheet of loosely woven tissue on each side of the midline .

1. **Paraxial mesoderm (somites)**
2. **Intermediate mesoderm** (kidney)
3. **Lateral plate mesoderm**

   **Divided into two layers:**

   **Somatic or parietal** mesoderm layer

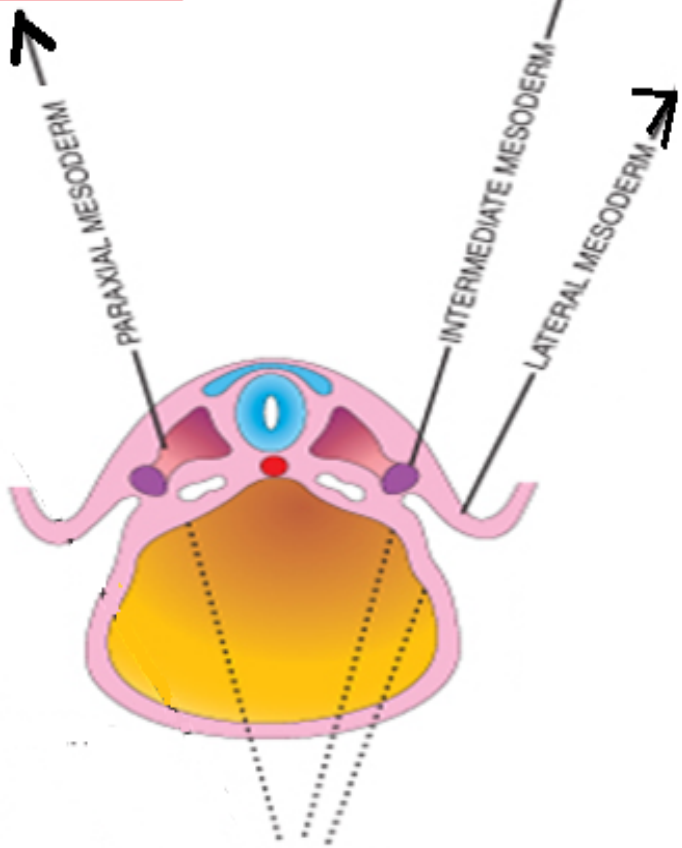
   **Splanchnic or visceral mesoderm** layer

Somites form vertebrae & ribs, dermis & skeletal muscles of back & lateral body wall & limbs.

Urogenital system

The somatic mesoderm, which is adjacent to the ectoderm and amnion, gives rise to the bones, ligaments, blood vessels, and connective tissue of the limbs.

The splanchnic mesoderm, forms the pericardium, pleura & peritonium and wall of heart and gut.




MESODERM

- **Each myotome and dermatome retains its innervation from its segment of origin, no matter where the cells migrate.**

Hence, each somite forms its own

**Sclerotome** (the tendon cartilage and bone component),

**Myotome** (providing the segmental muscle component),

**Dermatome**, which forms the dermis of the back.

**Each myotome and dermatome has its own segmental nerve component**

- **Lateral Plate Mesoderm**

  Splits into

  **Parietal (somatic) ) layer**

  Visceral (splanchnic) layer

**The parietal layer** of lateral plate mesoderm forms the dermis **and the bones and connective tissue of the limbs, and the sternum.**

**Sclerotome and muscle precursor cells**

**migrate into the parietal layer of lateral plate mesoderm to form**

- Costal cartilages,
- **Muscles of limb and ventral body wall.**
- **The visceral layer** of lateral plate mesoderm forms the wall of the gut tube including smooth muscles.

Mesoderm cells of the parietal layer form membranes which will line the **peritoneal, pleural, and pericardial cavities .**

Mesoderm cells of the visceral layer form a thin **serous membrane around each organ as heart, lung and gut.**

# THANKS