

"Somite Differentiation"

» Introduction

- Paraxial mesoderm begins to organize into segments by the beginning of 3rd week
- Segments called somitomes (consisting of mesodermal cells arranged concentrically) first appear in cephalic region forming cephalocaudally
- These somitomes organize into somites from occipital region caudally
- These somites initially exist as a ball of mesodermal cells (fibroblast-like cells)
 - They undergo epithelization
- Somites then arrange themselves in a donut shaped structure around a small lumen

» Sclerotomes

- Start formation at the beginning of 4th week
 - Cells of the ventromedial walls of somites lose their epithelial characteristics -> become mesenchymal (fibroblast-like) again
 - Surround notochord and neural tube
 - Are now called sclerotomes
- Form tendon, cartilage and bone component

» Myotomes

- Cells from dorsomedial and ventrolateral edges of upper region of somites > form precursors for muscle cells called myotomes
 - Form segmental muscle component

» Dermatomes

- Cells between dorsomedial and ventrolateral groups -> Dermatomes -> form dermis of back

» Dermomyotome

- Cells from both dorsomedial and ventrolateral groups -> become mesenchymal again
- They migrate beneath dermatome > form dermomyotome
 - Form:
 - Dermis for the skin of the back
 - Muscles for the back
 - Muscles for the body wall (intercostal muscles)
 - Some limb muscles

» Migration into Lateral Plate Mesoderm

- Some cells from the ventrolateral edge of somite migrate into somatic layer of lateral plate mesoderm

• Form:

- Most of the musculature for the body wall (external and internal oblique + transversus abdominus)
 - Most of the limb muscles

» Innervation

- Each myotome and dermatome retains its innervation from its segment of origin
 - Each has its own segmental nerve component