

Initially, there is a well-defined border between each somite and parietal layer of lateral plate mesoderm called the lateral somitic frontier. This frontier separates two mesodermal domains in the embryo:

1. The **primaxial domain** that comprises the region around the neural tube and contains only somite-derived (paraxial mesoderm) cells.
2. The **abaxial domain** that consists of the parietal layer of lateral plate mesoderm together with somite cells that have migrated across the lateral somitic frontier.

Muscle cells that cross this frontier (those from the VLL edge of the myotome) and enter the lateral plate mesoderm comprise the abaxial muscle cell precursors; those that remain in the paraxial mesoderm and do not cross the frontier (the remaining VLL cells and all of the DML cells) comprise the primaxial muscle cell precursors.

Innervation

1. Epaxial muscles (above the axis) - **back muscles** - are innervated by dorsal primary rami
2. Hypaxial muscles (below the axis) - **body wall and limb muscles** - are innervated by ventral primary rami

Cardiac Muscle

Cardiac muscle develops from splanchnic mesoderm surrounding the endothelial heart tube. Myoblasts adhere to one another by special attachments that later develop into **intercalated discs**. Myofibrils develop as in skeletal muscle, but myoblasts do not fuse. During later development, a few special bundles of muscle cells with irregularly distributed myofibrils become visible. These bundles, **Purkinje's fibers** (http://en.wikipedia.org/wiki/Purkinje_fibers), form the conducting system of the heart.

Smooth Muscle

Smooth muscle for the dorsal aorta and large arteries is derived from lateral plate mesoderm and neural crest cells. In the coronary arteries smooth muscle originates from proepicardial cells and neural crest cells. Smooth muscle in the wall of the gut derivatives is derived from the splanchnic layer of lateral plate mesoderm that surrounds these structures. Only the sphincter and dilator muscles of the pupil and muscle tissue in mammary and sweat glands are derived from **ectoderm**.

Links

- Muscular system (http://en.wikipedia.org/wiki/Muscular_system)

Bibliography

- SADLER, T. W. *Langman's Medical Embryology*. 12th edition. Lippincott Williams & Wilkins, 2012. Chapter 11: Muscular System. ISBN 978-1-4511-4461-1.
- WIKIPEDIA. *Muscular system* [online]. [cit. 2012-12-04]. <http://en.wikipedia.org/wiki/Muscular_system>.