

## **Variations in Tissue Interactions During Head Muscle Development**

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For decades it has been established that head muscle development differs from trunk muscle development. Similarly known, even though not in such detail, is that different subgroups of head muscles develop dependent on different underlying gene regulatory networks. Even less well studied are the tissue interactions during the developmental processes. Muscles derived from pharyngeal arch mesoderm depend on interactions with endoderm and neural crest cells, and, to a minor extent, ectodermal cues. Extraocular eye muscles respond to a mix of signals from surrounding mesoderm, but also neural crest cells; however, they are independent of endodermal cues. Head muscles derived from occipital paraxial mesoderm depend on tissue interactions similar to pharyngeal arch muscles but have a different migration trajectory. While the pharyngeal arch mesodermal cells and neural crest cells largely migrate from dorsal to ventral, the occipital paraxial mesodermal cells migrate from dorsal to ventral and from posterior to anterior. During the migration these cells proliferate and even start to differentiate, while pharyngeal mesodermal cells begin the differentiation process after reaching their respective pharyngeal arches. Here we present an overview of tissue interactions during the development of different head muscle populations, highlighting general concepts and main differences.

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