Craniofacial Development The Tissue and Molecular Interactions That Control Development of the Head (Advances in Anatomy, Embryology and Cell Biology)

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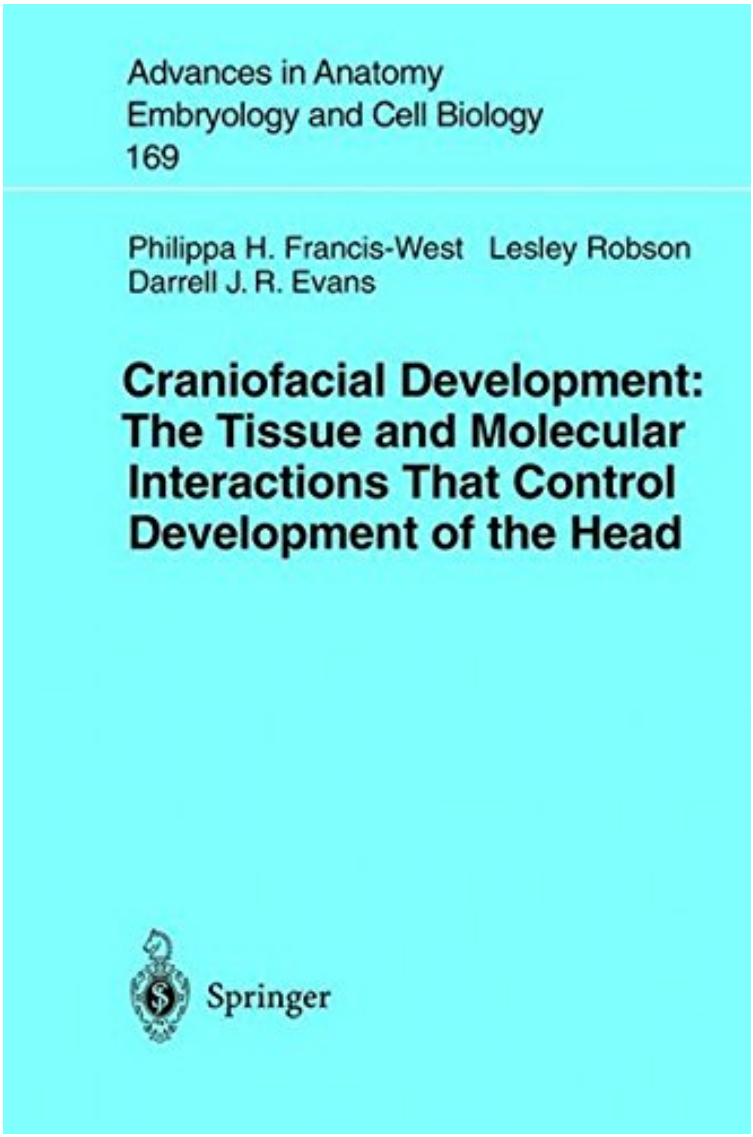

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Philippa H. Francis-West, Lesley Robson, Darrell J.R. Evans : Craniofacial Development The Tissue and Molecular Interactions That Control Development of the Head (Advances in Anatomy, Embryology and Cell Biology) before purchasing it in order to gage whether or not it would be worth my time, and all praised Craniofacial

Development The Tissue and Molecular Interactions That Control Development of the Head (Advances in Anatomy, Embryology and Cell Biology):

Craniofacial development is a multistep and intricate process initially involving a number of inductive interactions that control neural and neural crest development, which are followed by a series of epithelial-mesenchymal interactions that control outgrowth, patterning, and skeletal differentiation. Certain aspects of craniofacial development are unique developmental processes in higher vertebrates. First, in higher vertebrates the cranial neural crest, in contrast to the trunk neural crest, gives rise to the skeletal structures. These skeletal elements include those comprising mem brane bone and secondary cartilage, which with the exception of the clavicle are tissue types found exclusively in the head in higher vertebrates. Second, with the exception of the tongue, the origin of the musculature is distinct from other regions of the body. The body and tongue muscles are formed from the segmented epithelial somites whilst the head musculature is formed from unsegmented paraxial and prechordal mesoderm. Furthermore, the signalling cascades that control myogenic differentia tion appear to be distinct as determined by gene expression and the response of myogenic cells to growth factors. Finally, the neurogenic placodes, which give rise to the sensory organs and some cranial ganglia, are only found in the head. Over recent years, there have been significant advances in our knowledge of the molecular proc esses that control craniofacial development in a number of animal models. This has given insight into the genes that control many aspects of head development from the initial induction of the head to the final stages of differentiation.

From the Back CoverThe molecular cascades that control craniofacial development have until recently been little understood. The paucity of data that exists has in part been due to the complexity of the head, which is a unique, and possibly one of the most intricate regions of the body. However, the generation of mouse mutants, the identification of gene mutations that cause human craniofacial syndromes, together with classical embryological approaches in other species has now given significant insight into how the head develops. These studies have emphasized how unique the head actually is with each individual part governed by a distinct set of signalling interactions, again demonstrating the complexity of this region of the body.