

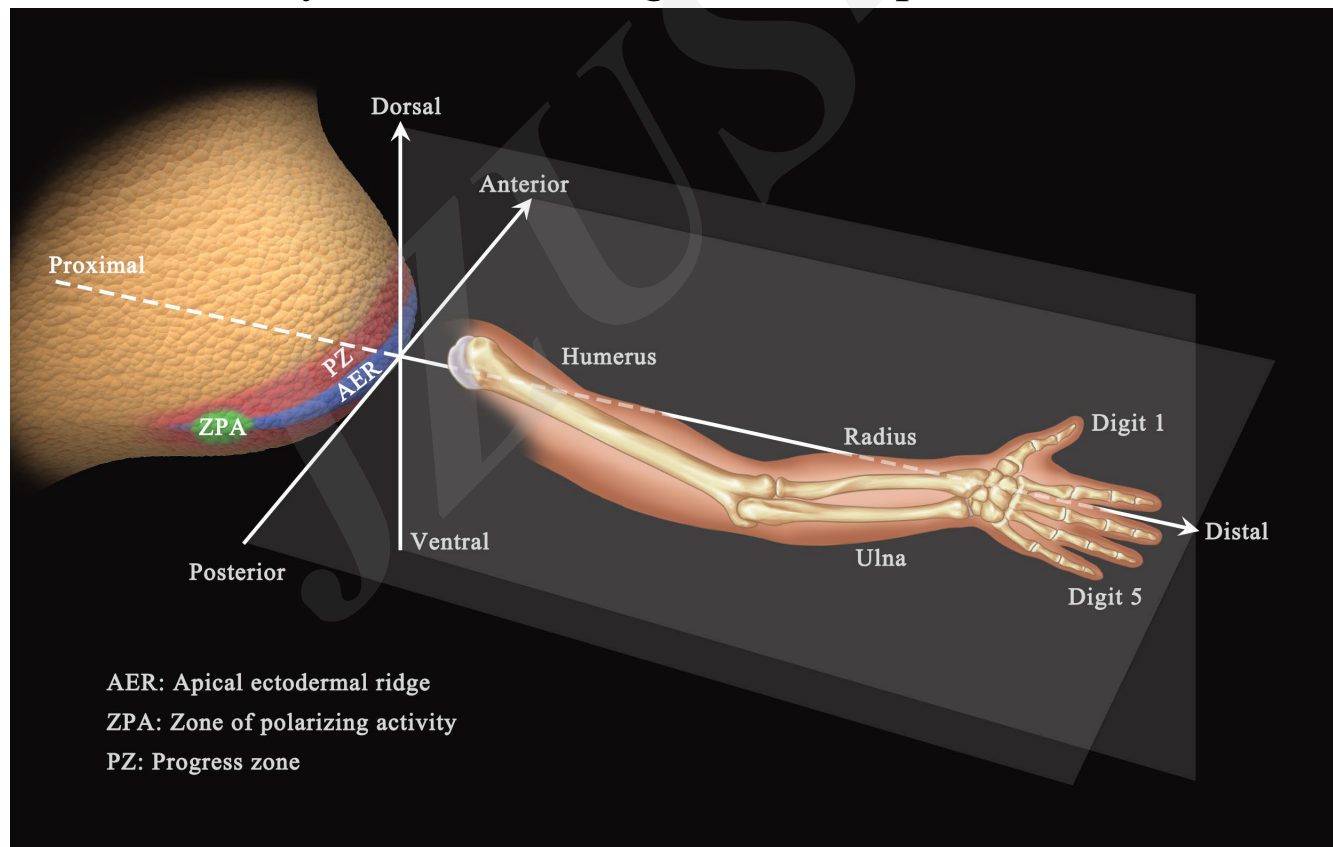
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Apical ectodermal ridge regulates three principal axes of the developing limb

Key words: Apical ectodermal ridge, Limb development, Fibroblast growth factor, Zone of polarizing activity

Summary

- This review summarizes the literature relating to the specific roles of the AER in three main axes and in shaping the developing limbs. As different processes occur simultaneously in limb development, it is important to understand the crosstalk among the three main axes of AER to accurately describe limb growth and pattern formation.



Highlights

- The principal function of the AER is the regulation of proximodistal patterning. This is achieved directly through FGFs, while the specific model for explaining proximodistal patterning remains unclear.
- During anteroposterior patterning, the AER acts as a dual-direction regulator in which it promotes Shh expression in ZPA for proliferation, and inhibits Shh expression in the anterior mesenchyme.
- In dorsoventral patterning, the AER activates En1 expression, thus it suppresses Wnt7a expression in the ventral ectoderm by the expression of Fgfs, Sp6/8 and Bmps.
- Additionally, levels of the FGF4 and FGF8 protein expressed in the AER affects the patterning of individual digits, and are regulated by Bmps in the AER.