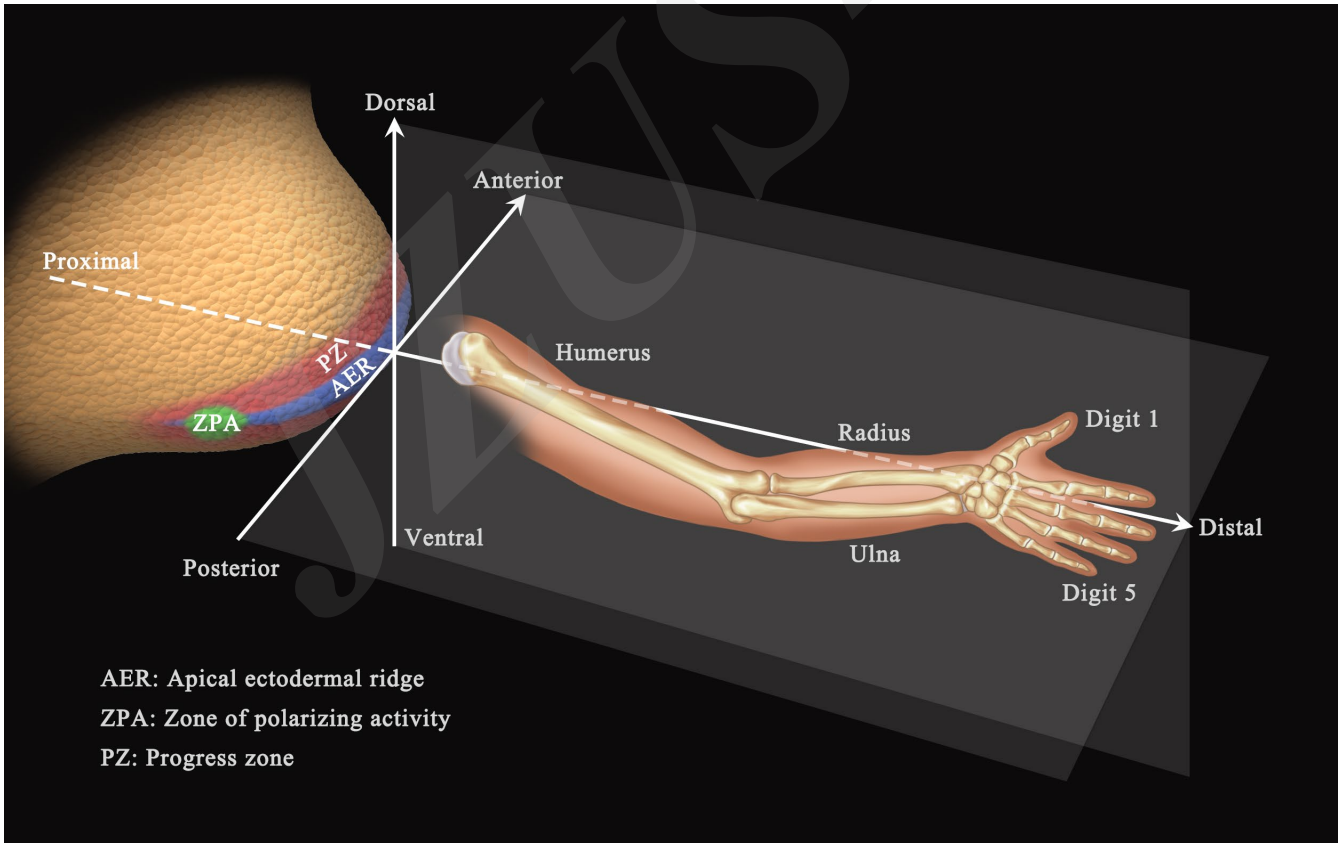
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Apical ectodermal ridge regulates three principal axes of the developing limb

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

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