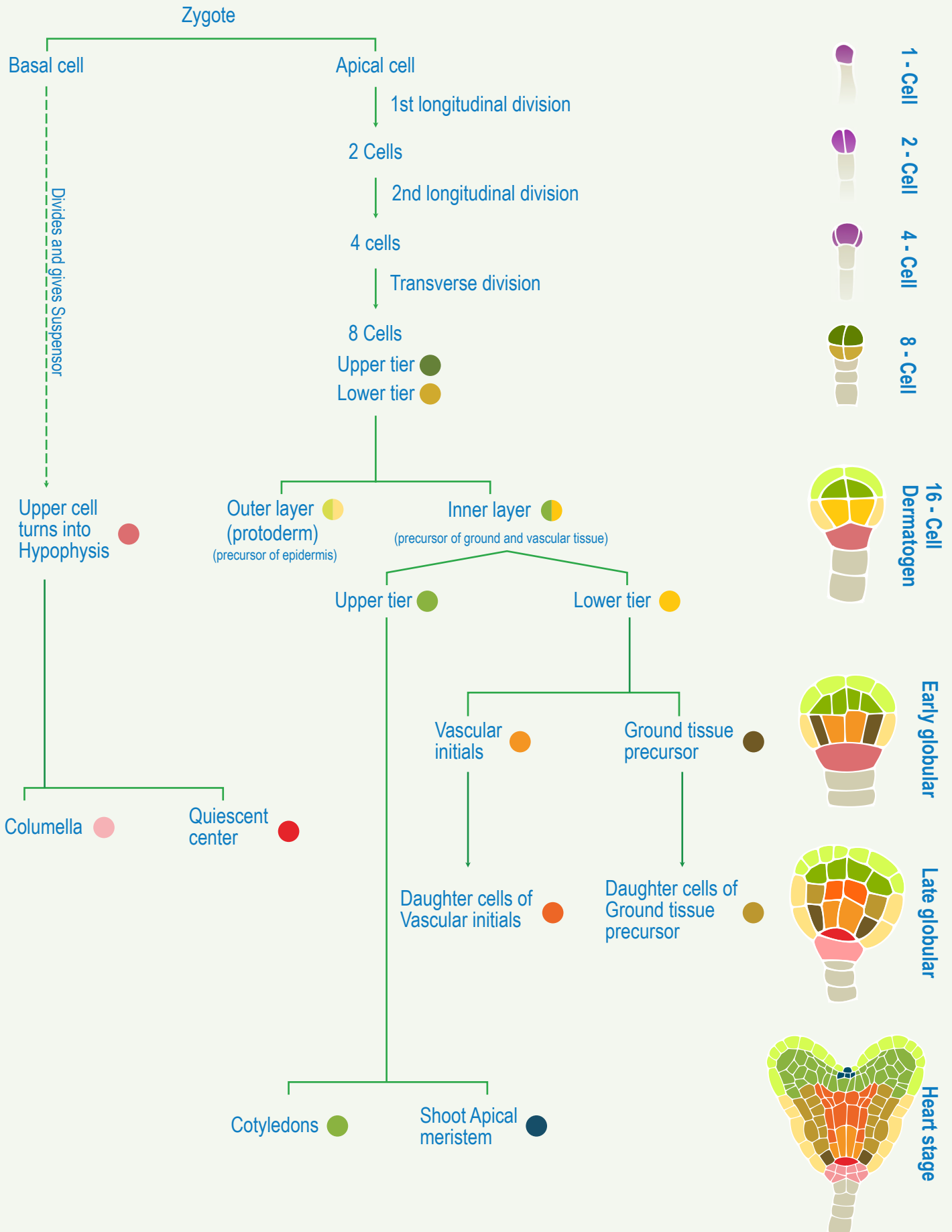




Arabidopsis early embryo development

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During plant embryogenesis, the formation of an axial-radial pattern ultimately determines the developmental fates of the embryo (Capron et al. 2009). In Arabidopsis, it starts with the asymmetrical zygotic division that generates a small apical cell (purple) and a basal cell (grey). After two rounds of longitudinal divisions and one round of transverse division, the apical cell converts into an octant stage embryo (8-celled). The basal cell divides anticlinally. It produces six to nine suspensor cells that help in connecting the embryo to the vascular system of the plant for nutritional purposes (Capron et al. 2009). The eight-celled embryo has two domains, an upper tier (green) and a lower tier (orange/yellow). The upper tier domain of the embryo proper, corresponding to the apical domain, gives rise to the shoot apical meristem (SAM) and the cotyledons (embryonic leaves). The lower tier will generate the embryonic root and hypocotyl (ground, and vascular tissues). The 8-cell embryo divides radially, to generate the outer layer (protoderm), the precursor of the epidermis, forming a 16-cell (dermatogen) embryo. At the globular stage, the upper suspensor cell, the hypophysis, divides asymmetrically to contribute to the formation of the root apical meristem (RAM). Divisions of the inner cells, aligned with the apical-basal axis, will form the vascular tissues, surrounded by ground tissue cells that will generate endodermis and cortical cell types. The development of cotyledons marks the end of the globular stage, thus giving the embryo a bilateral symmetry and a heart shaped appearance.

Verma et al., 2020. An essential function for auxin in embryo development. CSHL Perspectives in Biology.

Capron, A. et al., 2009. Embryogenesis: pattern formation from a single cell. The Arabidopsis Book, 7, p.e0126.



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