

PLANT ANATOMICAL CELL TYPES

Cell Type	Characteristics	Location	Function
Parenchyma	<p>Shape: commonly polyhedral - variable.</p> <p>Cell Wall: primary or primary and secondary, may be lignified, suberized or cutinized.</p> <p>Living at functional maturity (although may still serve intended purpose when dead, e.g. phellem).</p>	<p>Located in many regions of the plant. Parenchyma tissue occurs in the cortex, pith, pith rays, xylem and phloem.</p>	<p>Parenchyma performs many of the living functions of the plant, including respiration, digestion, photosynthesis – essentially all metabolic functions. Storage & conduction tissues frequently contain parenchyma.</p>
Collenchyma	<p>Shape: elongated.</p> <p>Cell Wall: primary only, highly hemicellulosic and pectic, not lignified.</p> <p>Living at functional maturity.</p>	<p>Collenchyma may be distributed peripherally as a cylinder in young stems (just beneath the epidermis) or only in patches in ribs. Collenchyma is also found along the veins in leaves of dicots.</p>	<p>Collenchyma provides a living support system for the primary plant body. The primary distinguishing character is that it is extensible. Since it depends on turgor, it is sensitive to wilting.</p>
Sclerenchyma	<p>Shape: generally very long.</p> <p>Fibers Cell wall: primary and thick secondary walls - often lignified.</p> <p>Often dead at functional maturity, but may remain living.</p>	<p>Sometimes in cortex of stems, most often associated with xylem and phloem. Also found particularly in the leaves of monocots.</p>	<p>Sclerenchyma fibers provide for rigid support and are typically non-living cells. Fibers often frequently .</p>
Sclerenchyma	<p>Shape: Often isodiametric; usually shorter than fibers.</p> <p>Sclereids Cell wall: primary and thick secondary walls - generally lignified.</p> <p>May be living or dead at functional maturity.</p>	<p>Sclereids occur as a component of just about any organ or tissue system and are quite characteristic in vascular tissue and in seed coats.</p>	<p>Sclereids function in the mechanical support of parenchyma tissues.</p>

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Tracheary Element	Shape: elongated, tapering.	Xylem	Chief water-conducting element in Gymnosperms and lower vascular plants--also found in Angiosperm xylem.
Tracheid	Cell wall: primary and secondary, lignified Contains pits but no perforations. Dead at functional maturity.		
Tracheary Element	Shape: elongated, tapering.	Xylem	Chief water-conducting element in Angiosperm xylem.
Vessel member	Cell wall: primary and secondary, lignified. In addition to pits, has perforations. Vessels are composed of vessel members in series connected by perforation plates. Dead at functional maturity.		
Sieve Element	Shape: elongated, tapering.	Phloem	Chief food-conducting element in phloem of gymnosperm and lower vascular plants.
Sieve Cell	Cell Wall: primary in most species, with sieve areas on the walls. Sieve areas are wall areas with pores through which the protoplasts of adjoining cells are connected. Callose is often associated with wall and pores. Cells are living in their functional state. Higher plants' sieve cells lack a nucleus at maturity, but some lower vascular plants are exceptional. Tonoplast often not discerned at functional maturity.		
Albuminous Cell	Shape: generally elongated. Cell Wall: primary. Cells are living in their functional state and are associated with sieve cells, although they are generally not derived from same mother cell as sieve cell.	Phloem	Believed to play a role in movement of food into and out of the sieve cell.

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Sieve Element	Shape: elongated.	Phloem	Chief food-conducting element in Angiosperm phloem
Sieve Tube Member	<p>Cell Wall: primary, with sieve areas on lateral walls and sieve plate on end walls. Sieve plates are specialized areas on end walls with much larger pores, lined with callose. Callose is often associated with wall and pores.</p> <p>Living at maturity. Protoplast similar to that of sieve cell, except for the presence in sieve-tube member of the proteinaceous substance known as "slime" or "P-protein." Several sieve-tube members in vertical series constitute a sieve tube.</p>		
Companion Cell	<p>Shape: variable, generally elongated.</p> <p>Cell Wall: primary.</p> <p>Living at maturity and chiefly associated with sieve-tube members. Companion cells are derived from same mother cell as the sieve-tube member and connected to it by numerous modified plasmodesmata.</p>	Phloem	Believed to play a role in movement of food into and out of the sieve-tube member.