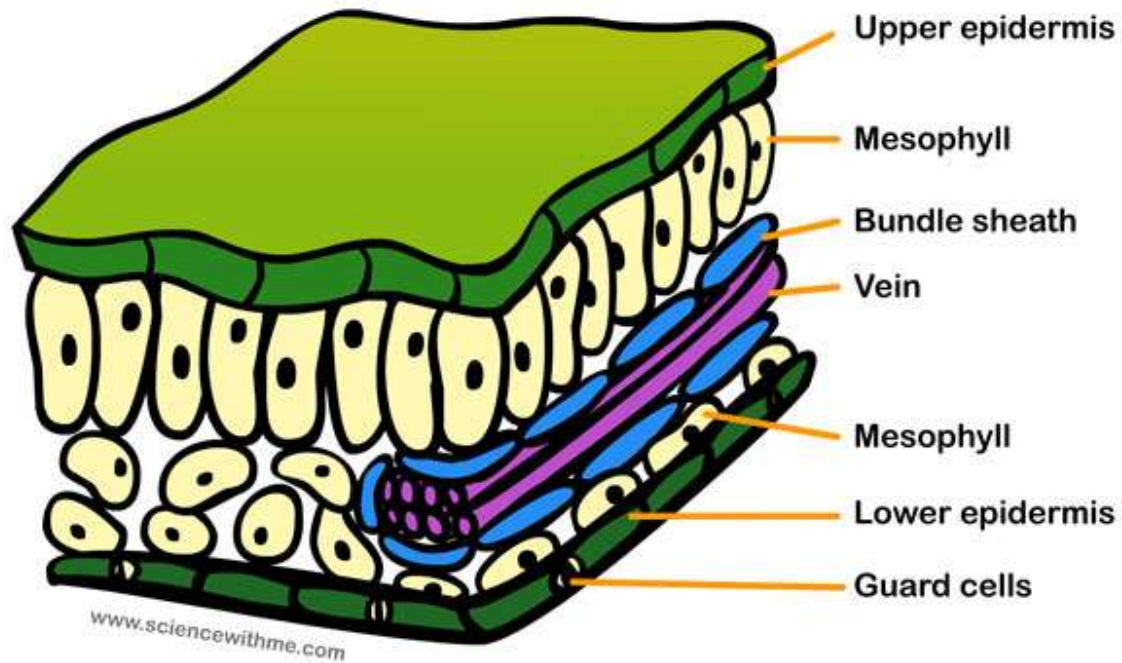
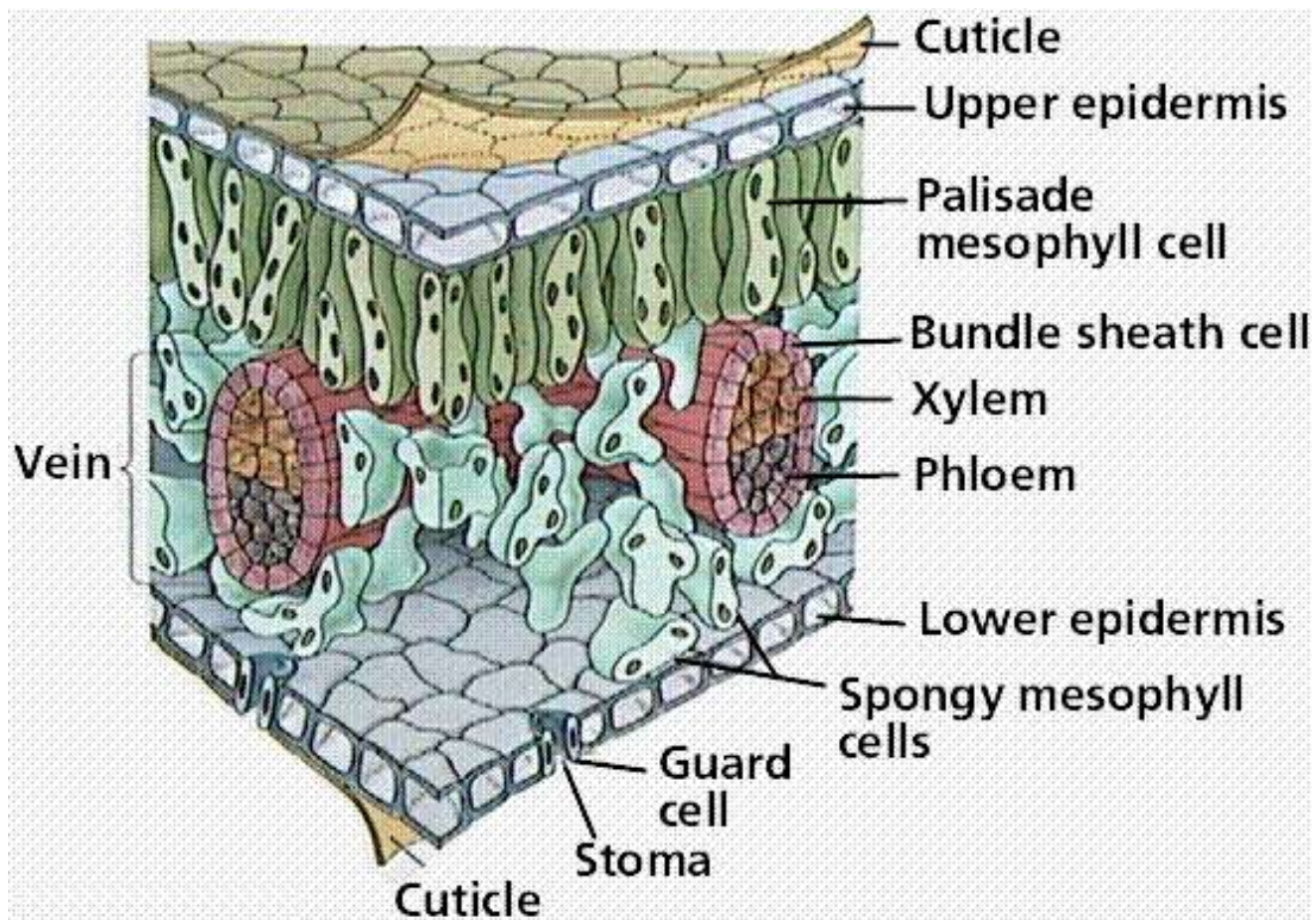




- Chapter 41
- *Plant Responses to Internal and External Signals*

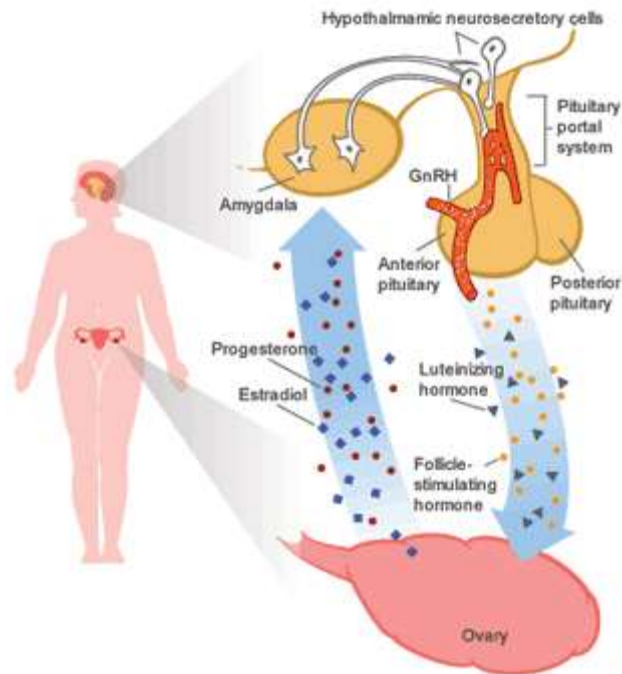
CROSS SECTION OF A LEAF





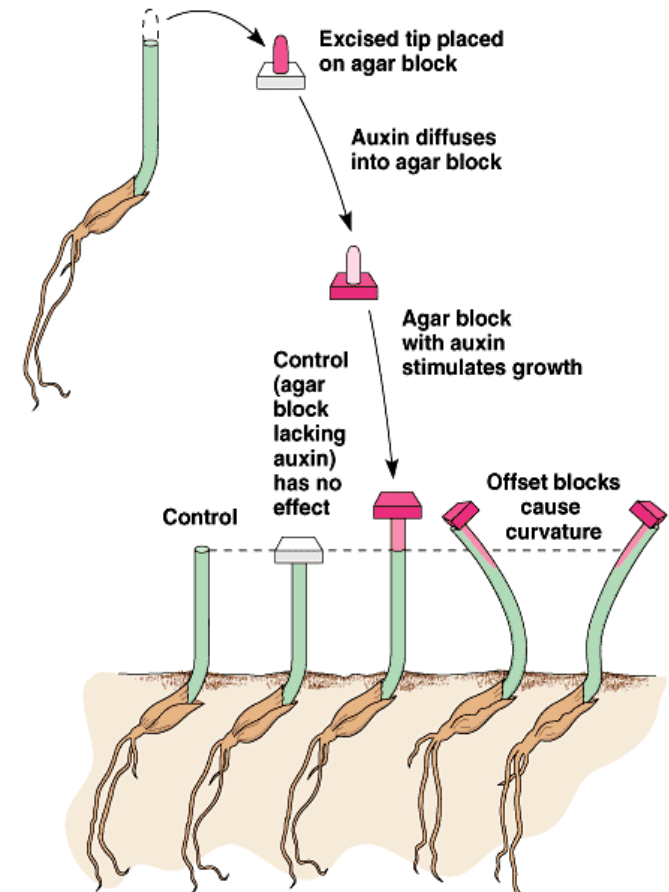
QOD

- Explain what a hormone is, what it does, and list three examples in plant or humans



Plant hormones

- Hormone: chemical signals that coordinate parts of an organism; produced in one part of the body and then transported to other parts of the body; low concentrations
- Tropism: movement toward or away from a stimulus
- Went experiments (phototropism)
- Hormone: auxin
- Others: gravitropism, thigmotropism



Hormone Summary Chart

Decorative Title		
Picture/ Example	Location	Function

1. Auxin
2. Cytokinin
3. Gibberellin
4. Abscisic Acid
5. Ethylene
6. Brassinosteroids

Auxin

- IAA (indoleacetic acid)
- Location: seed embryo; meristems of apical buds and young leaves
- Function: stem elongation; root growth, differentiation, branching; fruit development; apical dominance; tropisms

QuickTime™ and a
Cinepak decompressor
are needed to see this picture.

Cytokinins

- Zeatin
- Location: roots (and actively growing tissues)
- Function: root growth and differentiation; cell division and growth; germination; delay senescence (aging); apical dominance (w/ auxin)



Gibberellins

- GA₃
- Location: meristems of apical buds and roots, young leaves, embryo
- Function: germination of seed and bud; stem elongation; leaf growth; flowering (bolting); fruit development; root growth and differentiation



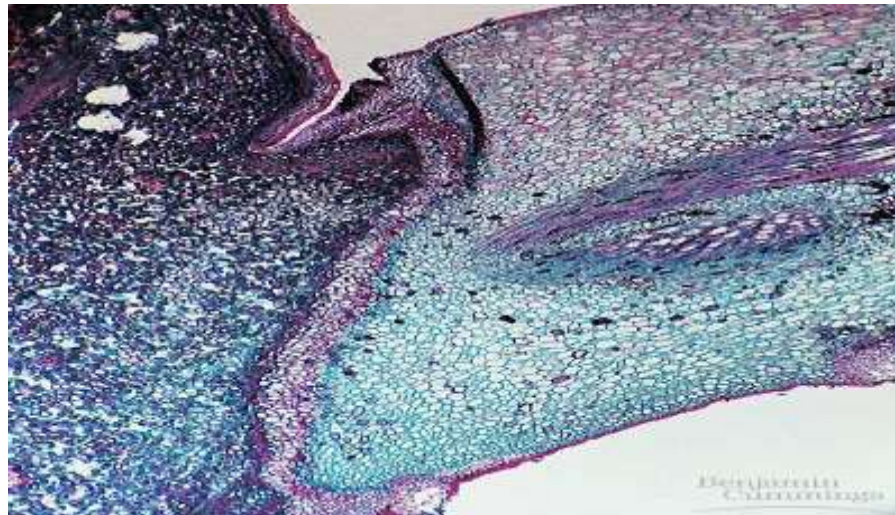
Abscisic acid

- ABA
- Location: leaves, stems, roots, green fruit
- Function: inhibits growth; closes stomata during stress; counteracts breaking of dormancy



Ethylene

- Gaseous hormone
- Location: ripening fruit tissue; stem nodes; aging leaves and flowers
- Function: fruit ripening; oppositional to auxin (leaf abscission); promotes/inhibits: growth/development of roots, leaves, and flowers; senescence



QOD

- Plants are able to respond to their environment in many ways. Choose three specific plant responses and briefly describe how they occur and what selective advantage they offer to the plant.



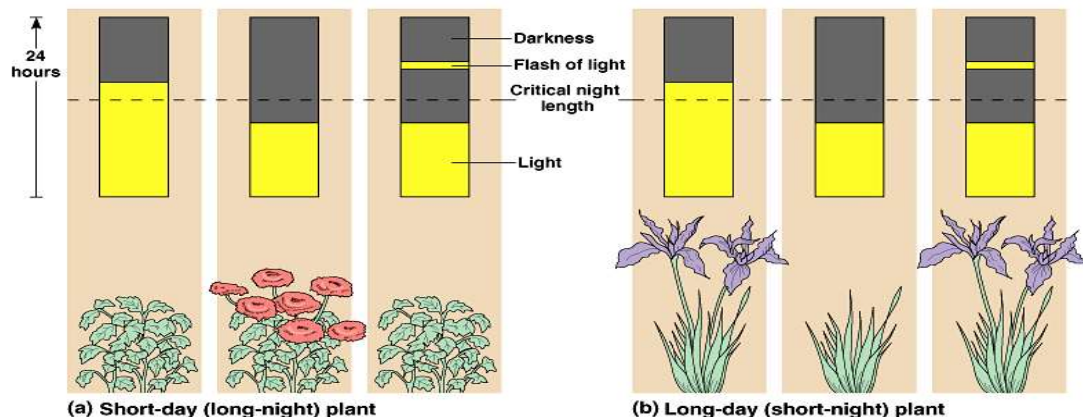
Daily and Seasonal Responses

- *Circadian rhythm* (24 hour periodicity)
- Short-day plant: light period shorter than a critical length to flower (flower in late summer, fall, or winter);
- Long-day plant: light period longer than a critical length to flower - flower in late spring or early summer;
- Day-neutral plant: unaffected by photoperiod
- *Critical night length* controls flowering
- *Photoperiodism* (phytochromes)

(poinsettias,
chrysanthemums)

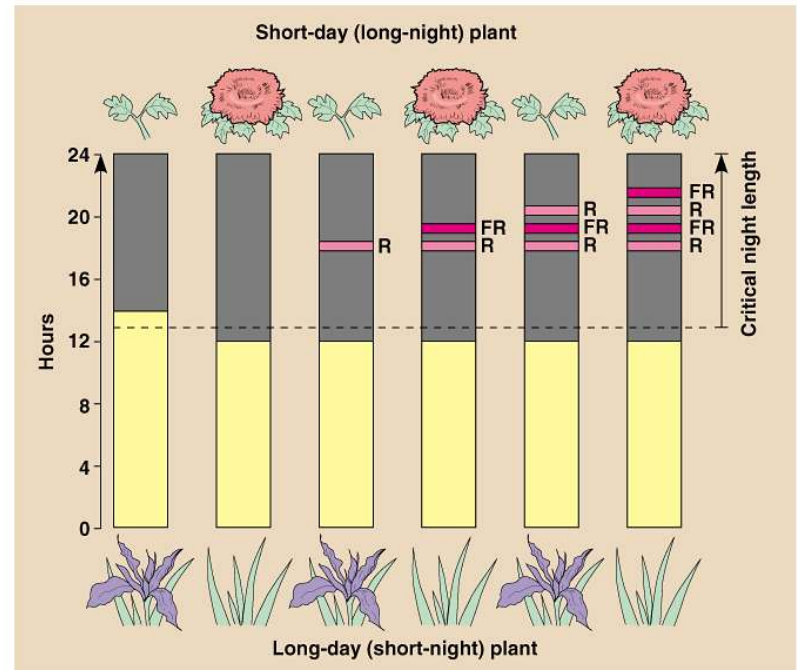
(spinach, radish,
lettuce, iris)

(tomatoes, rice,
dandelions)



Phytochromes

- Plant pigment that measures length of darkness in a photoperiod (red light)
- P_r (red absorbing) 660nm
- P_{fr} (far-red absorbing) 730nm



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