

Seedy Dealings: The Rise of Plants

Week 1 - Introduction; How do Plants Grow?

Plants vs. animals

Animals

Heterotrophic

No vacuoles

No cell wall

Tight Junctions

Cytokinesis

w/ constriction

Cell migration critical

Germ line sequestered

Gametic meiosis typical

Few totipotent cells

Limited modularity

Burst of organogenesis

Rigid development

Limited biochemistry

Plants

Phototrophic

Vacuoles

Rigid cell wall

Plasmodesmata

Cytokinesis

w/ phragmoplast

No cell migration

No germ line

Sporic meiosis typical

Many totipotent cells

Extreme modularity

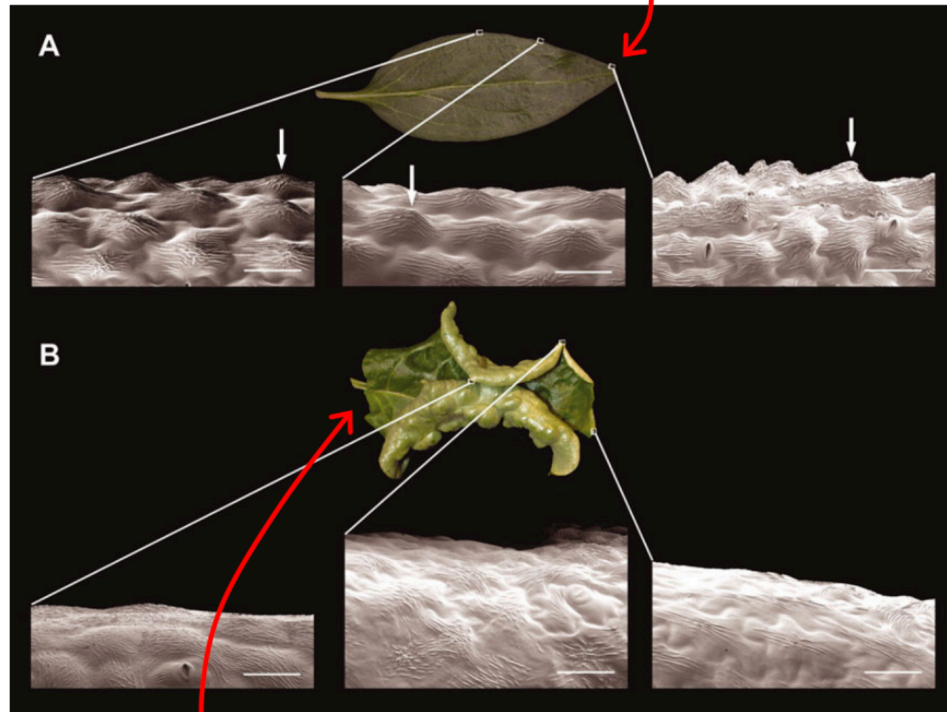
Continual organogenesis

Plastic development

Enormous biochemical diversity

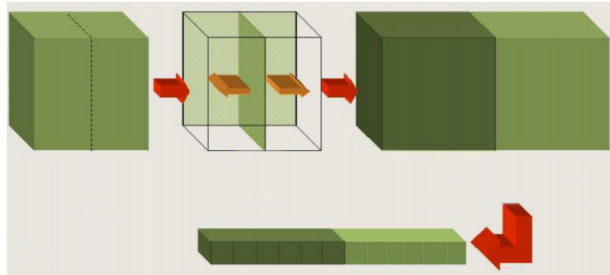
Critical processes related to cell division - timing

A normal, flat snapdragon leaf

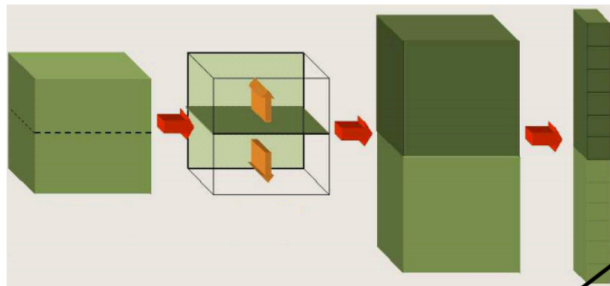


A leaf where the relative rates of cell division are uncoordinated.

Critical processes related to cell division - orientation



Anticlinal divisions
perpendicular to surface of plant

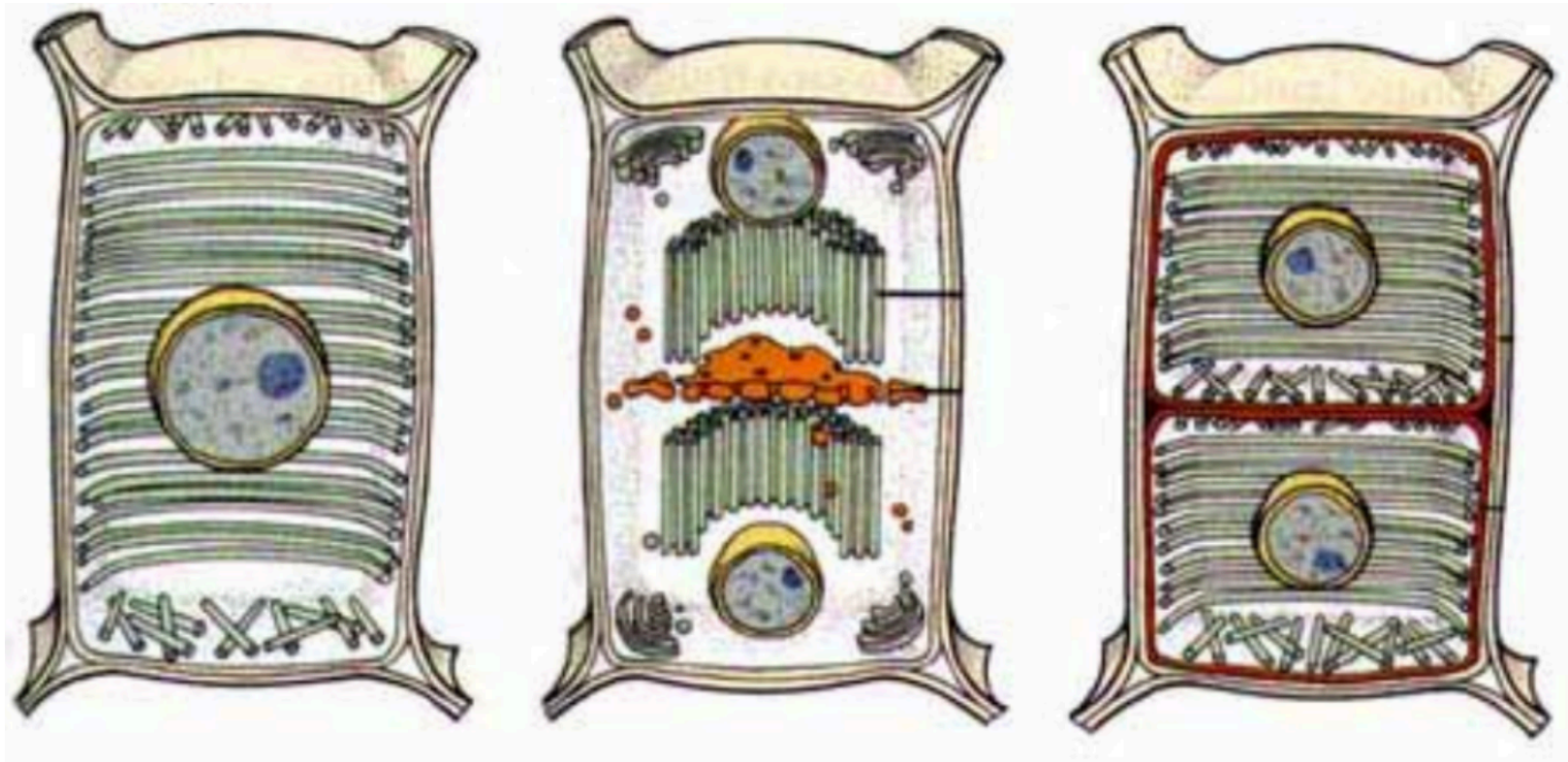


Periclinal divisions
parallel to surface of plant



Critical processes related to cell division

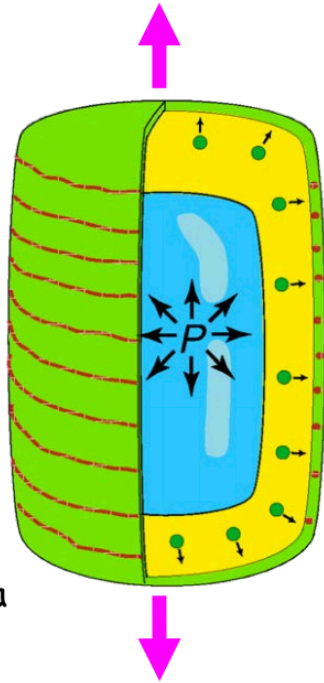
- symmetry



Two modes of growth

Diffuse Growth

Wall expansion is distributed over the whole cell surface



Kind of like blowing up a balloon

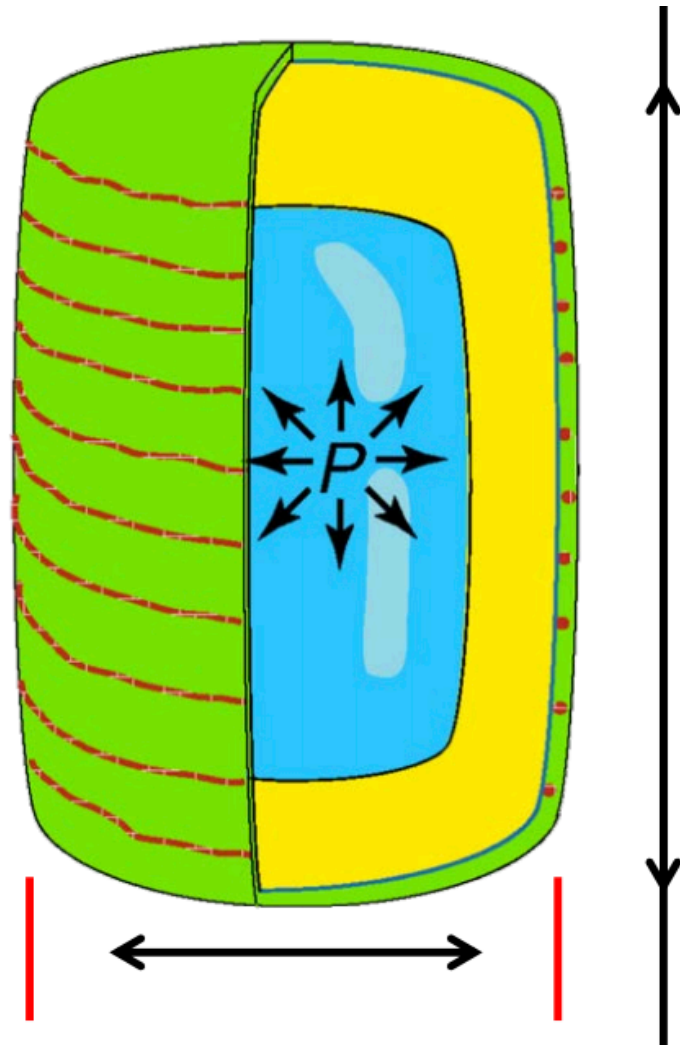
Tip Growth

Wall expansion is localized to one end of the cell

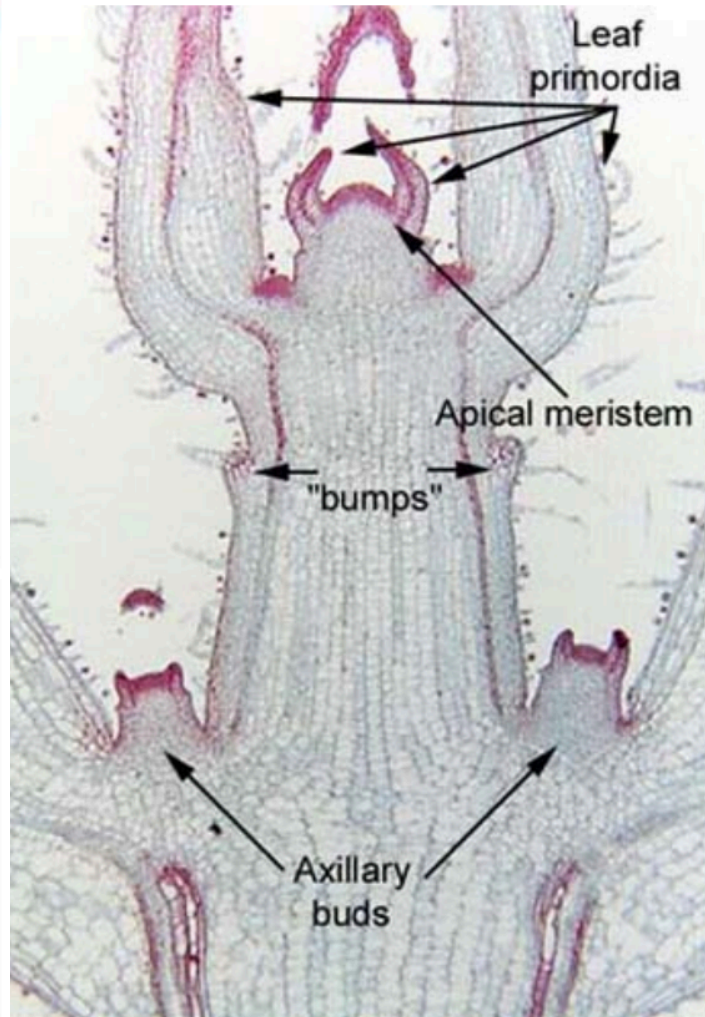
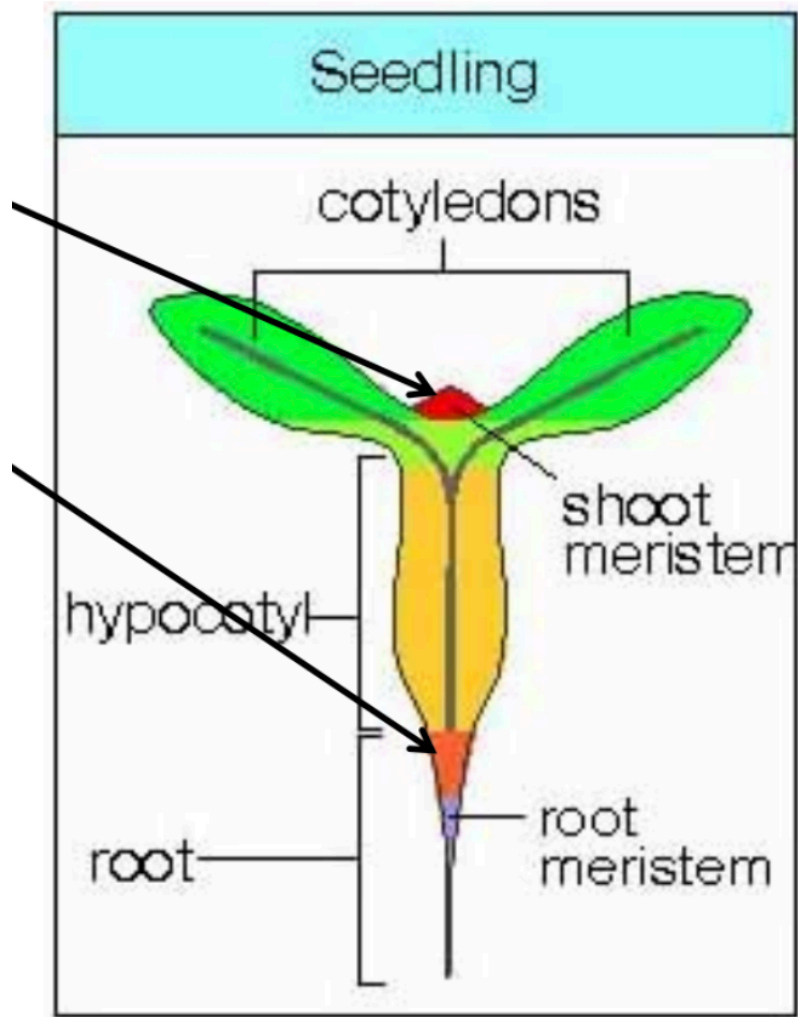


More like building an addition on your house

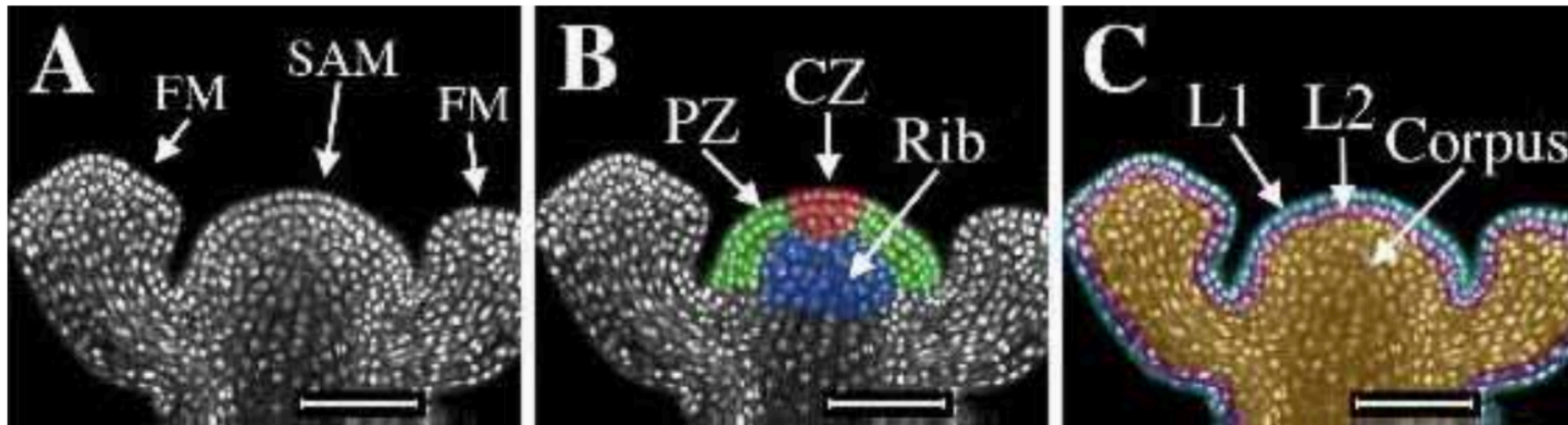
How do plant cells make different shapes?



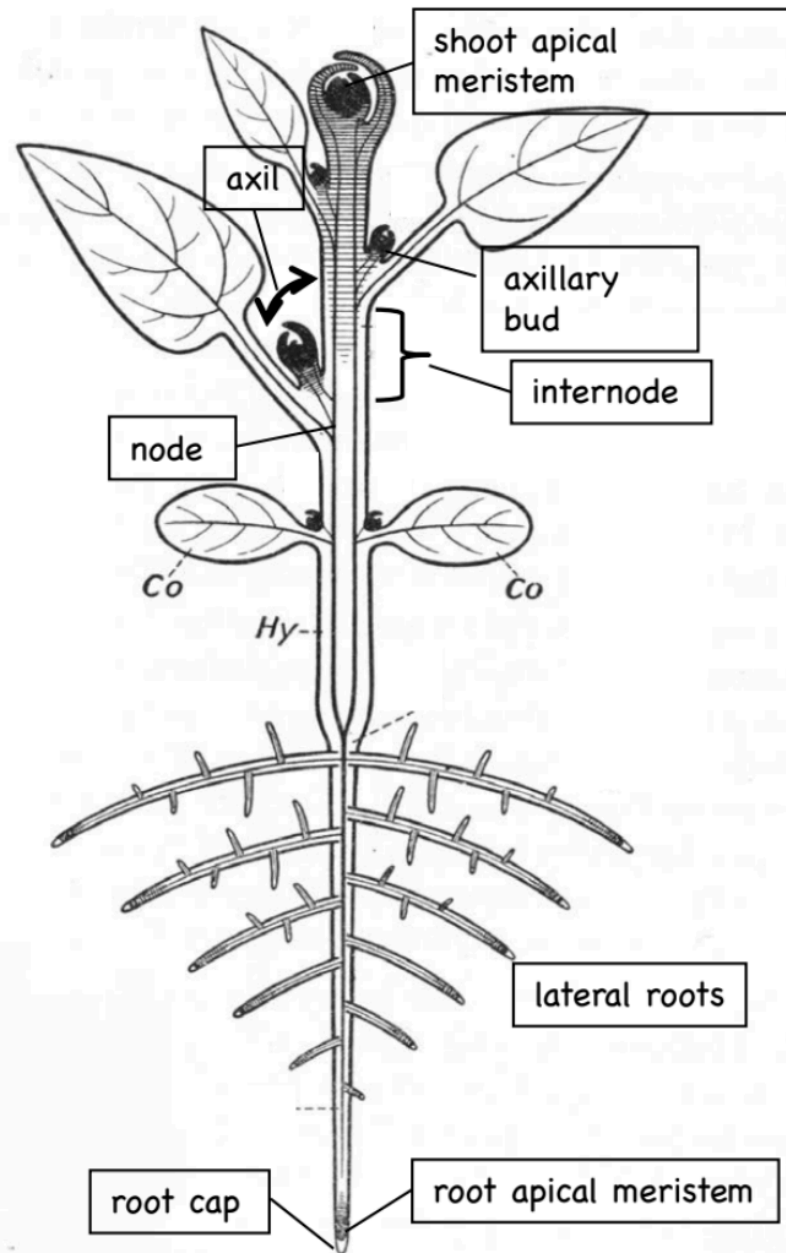
Meristems



Meristem zones/layers



Plant parts



Plant variation

