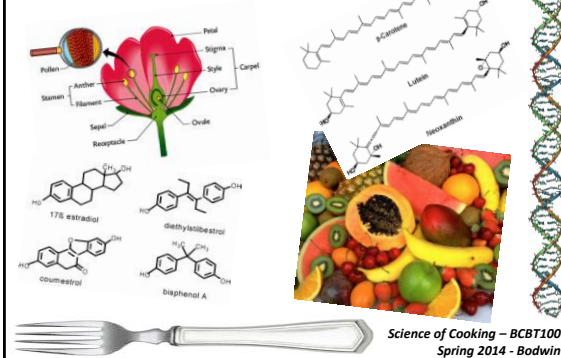


From Last Time:



Vegetables

Edible parts of plants that are **not**:

Fruit

Seed

Vegetables are:

Leaves, stems, roots



Plant Toxins

Why do they exist?

Alkaloids – bitter, poisonous

Potato sprouts

Protease inhibitors – block digestion

Soy/kidney/lima beans (undercooked)

Flavors – If some is good, more kills

Oxalates – insoluble crystals, “gout”

Spinach, chard, beets, rhubarb



Fruit & Veg Allergies

Fruit = Pollen

Allergies – reaction to “foreign” bits

Can be severe, deadly

“Oral allergy syndrome”



OAS Triggers

Alder pollen: almonds, apples, celery, cherries, hazel nuts, peaches, pears, parsley, strawberry, raspberry

Birch pollen: almonds, apples, apricots, avocados, bananas, carrots, celery, cherries, chicory, coriander, fennel, fig, hazel nuts, kiwifruit, nectarines, parsley, parsnips, peaches, pears, peppers, plums, potatoes, prunes, soy, strawberries, wheat; Potential: walnuts

Grass pollen: fig, melons, tomatoes, oranges

Mugwort pollen: carrots, celery, coriander, fennel, parsley, peppers, sunflower

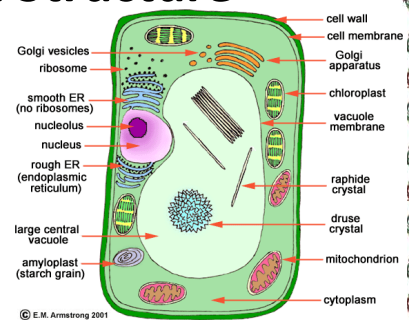
Ragweed pollen: banana, cantaloupe, cucumber, green pepper, paprika, sunflower seeds/oil, honeydew, watermelon, zucchini, echinacea, artichoke, dandelions, honey (if bees pollinate from wild flowers), hibiscus or chamomile tea

Possible cross-reactions (to any of the above): berries (strawberries, blueberries, raspberries, etc), citrus (oranges, lemons, etc), grapes, mango, figs, peanut, pineapple, pomegranates, watermelon



Plant Structure

Cells
and
cell
walls



Cell Wall

Structural, prevents dehydration

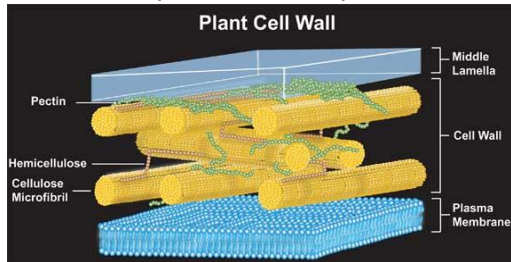


Image: <http://www.sigmaaldrich.com/file-science/metabolomics/enzyme-explorer/learning-center/lysing-enzymes.html>

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Cell Wall

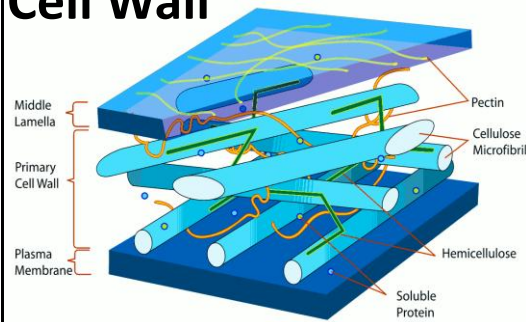


Image: http://www.woclipart.com/plants/diagrams/Plant_cell_wall_diagram.png

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Vacuole

“Fullness” alters rigidity of plant
Contains water & water soluble bits

Acids, sugars, proteins, pigments,
enzymes, etc



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Chloroplasts

Contain chlorophyll

Makes green plants green (leaf)

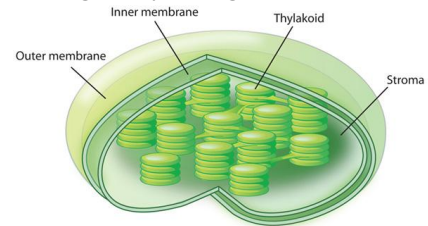


Image: <http://www.nature.com/bschable/topicpage/plant-cells-chloroplasts-and-cell-walls-1405395>

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Plant Tissues

Ground

Most of the cell mass, thin cell walls

Vascular

Nutrient transport, tough & fibrous

Dermal

Surface (“skin”), epidermis/periderm

Secretory

Oozes things...



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What do we eat?

Roots

Stems

Leaves

Flowers

Fruits

Seeds



Image: <http://aahachordodentary.com/>

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Cooking!

Consider the molecules
Cell walls = rigid/tough, fiber
Cooking removes non cellulose part

Removing water?



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Tasting Fruit & Veg

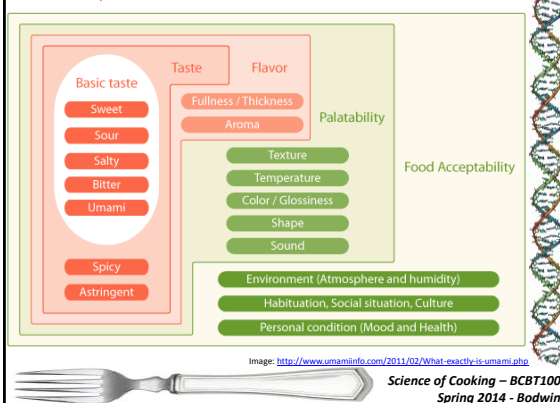
Multisensory:

Flavor
Aroma
Touch
Irritation



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How Humans Experience Their Food



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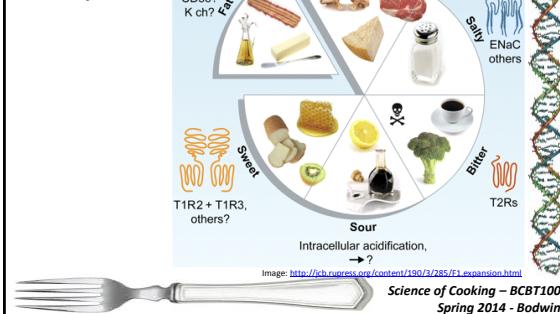
Flavor/Taste

Salty – salt
Sweet – sugar & sugar-like molecules
Sour – acids
Savory – protein richness
Bitter – alkaloids
Umami – glutamate/DNA richness
Metallic – bitter/sour



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Tastes Receptors



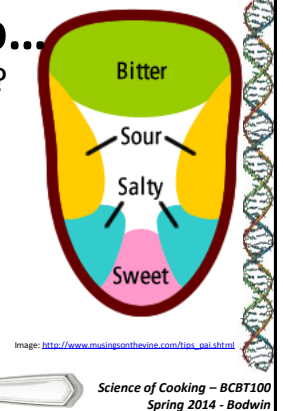
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Tongue Map...

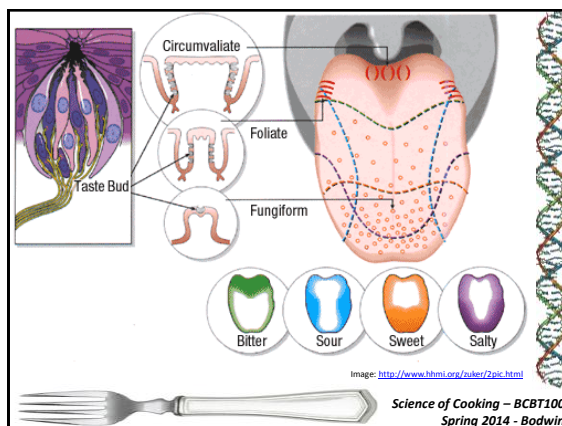
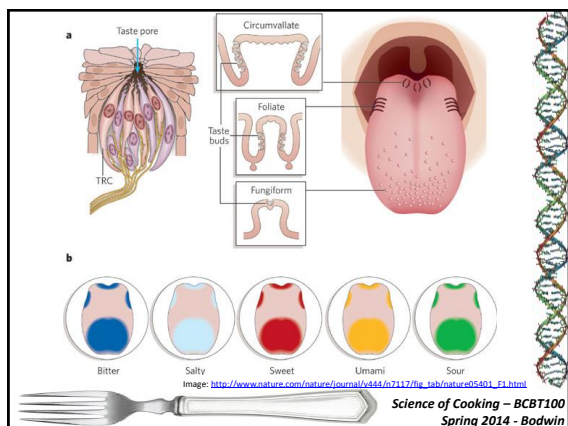
Where do we taste?

Use *science* to *test* this!

Not completely accurate...



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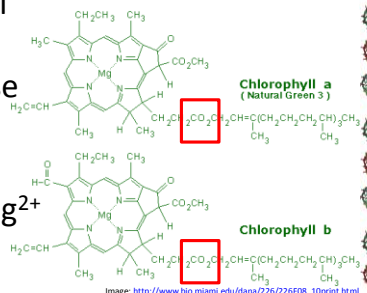


Cooking Plants

Chlorophyll

Acid or base
hydrolysis

Displace Mg^{2+}



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Keeping them green

Neutralize acid with baking soda

Baking soda = Sodium bicarbonate

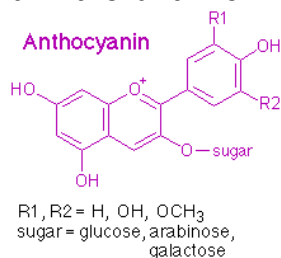
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Cooking Plants

Anthocyanins and Anthoxanthins

pH sensitive

Keep acidic!



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Cooking plants

Texture = firmness of cell walls

Acid + "hard" water = firm

"hard" = metals with +2 charge = bridge

Base + salt = soft

Sodium = Na^{+1} = cap

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Starchy plants

Starch grains are hard, BUT absorb
water and swell when heated
Heat breaks down cell walls, starch
absorbs water that's released

figure on p. 282 in McGee book...



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