The Cytoskeleton

Cytoskeleton: Network of fibers that compose the structure of the cells, primarily found in Eukaryotes but occasionally in prokaryotes

Filaments contain a + and − end
↳ change length by adding/removing subunits called "Dynamic Instability" usually change on the + end

Contains 3 types of filaments:

1. Microtubles
2. Microfilaments
3. Intermediate Filaments

Microtubles: Rods created from 2 types of globular protein subunits
↳ Alpha/beta tubulins

- Act as support units
- Attach w/ vesicles
- Found in cilia, flagella, centrosomes

Cilia/Flagella contain a "9 + 2 Arrangement"

- 9 microtuble doublets
- 2 microtubles in the center

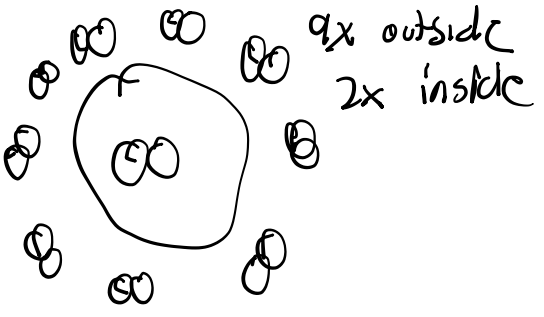
Doublet microtuble: Unit measured w/ microtubles → includes 9 outer microtubles, 2 center microtubles → 9+2

At the base of the cilia, the form 9+0 doublet is used (9 outer microtubles, 0 central ones)

Centrioles also use 9+0

The base is called a "basal body" non-motile (unlike rest of molecules)

doublet 9+2 structure!



Vesicles attach and move along microtubles using **motor proteins**

2 motor proteins:

- **Kinesins:** moves to the + end of the plasma membrane
- **Dyenin:** retrograde, towards the nucleus

Microfilaments: Thin, solid rods also known as **actin** filaments
↳ made of globular actin proteins, twisted double-chains
myosin: a motor protein meant for muscle movement

Intermediate Filaments: More permanent than microtubles/microtubles
↳ less dynamically unstable, used for structural support

Cell-Cell Junctions – The mechanisms in which cells connect with one another.

Plasmodesmata: Creates small holes in cell walls, allowing for nutrient exchange (Unique to plant cells)

Gap Junction: Connects cytoplasm through holes in the cell membrane (Unique to animal cells)

Tight Junctions: Creates a watertight seal between cells, prevents liquids from passing through

Desmosomes: Connects cells through intermediate filaments

Adherens Junctions: Connects cells through microfilaments

Animals also contain a system of structural and (communication) proteins called the **extracellular matrix**