Cytoskeleton

**Microfilaments (Actin Filaments)**

* Long thin fibres (7nm)
* Two chains of twisted globular actin
* Keep organelles in their place, Rigidity and shape to cell
* Movement of cell (web under plasma membrane- pseudo pods) and organelles- motor molecules, myosin, with ATP)
* In microvilli
* Plants-tracks along which chloroplasts circulate
* Can disassemble and reform quickly (WBC make use of this)

**Microtubules**

* Small hollow cylinders (d=25nm, L=0.2-25um)
* 13 rows of tubulin dimers
* Help cell maintain cell shape (resist compression), move vesicles and organelles (tracks), separate chromosomes during mitosis
* Controlled by centrosome
* Motor molecule kinesin and dynein (kinesin -vesicles moving from ER)
* Dynein in flagella
* Dissolve and reform quickly

**Intermediate Filaments**

* Diameter=8-11nm
* Rope-like assembly of fibrous polypeptides
* Support nuclear envelop and plasma membrane, Hold together tissues like skin
* Eg. Keratin in skin – gives mechanical strength

**Centrioles**

* Short cylinders in 9+0 triplets
* Pair make centrosome – organizes microtubules (spindle apparatus) during cell division
* Give rise to basal body that directs organization of microtubules within cilia and flagella

**Cilia and Flagella**

* Membrane bound cylinders enclosing matrix area
* 9+2 microtubues
  + In matrix there are 9 microtubule pairs arranged in a circle around 2 central microtubules
* Move when microtubule doublet slides past each other
* Basal body at base
  + Organize structure of 9 outer doublets
  + has same arrangement as centrioles, 9+0 (derived from them)