

Ribosomes

- Site of protein synthesis; non-membrane **bound**.
- **Composed** of 2 (small & large) **subunits**, each made up of rRNA & **proteins**.
- **Occur** freely (single or in groups – polyribosomes) or **attached to ER**.
- N° depends on **cell function**, e.g. pancreatic cells have many b/c their secretions contain **proteins**.
- **Bind** to ER if protein synthesis begins with **signal peptide**, which binds to recognition particle (SRP) which then binds to **SRP receptor on ER**.
- **Protein** enters ER, a peptidase (enzyme) cleaves off signal peptide & proteins ends up within lumen of ER.

- Centrioles...
 - **Short** cylinders with ring pattern (9 + 0) of microtubule triplets (ring has 9 sets of triplets, **none in middle**).
 - In **animal** cells + most protists: centrosome contains 2 centrioles at right angles to **each other**.
 - Before **cell division**, centrioles duplicate, each pair moves apart during **cell division**.
 - **Plant** and fungal cells have the equivalent of centrosome, but do not contain **centrioles**.
 - **Centrioles** serve as *basal bodies* for **cilia & flagella**.

- Cilia & Flagella...
 - **Cilia**: short, usually numerous *hairlike projections* that move in undulating fashion (e.g., *Paramecium*; lining of human upper respiratory tract) or **like an oar (stiff)**.
 - **Flagella**: longer, usually fewer, projections that move in whip-like fashion (e.g., **sperm cells**).
 - **Both**: membrane-bounded cylinders enclosing a matrix containing 9 microtubule doublets around 2 central microtubules cylinder (**9 + 2 pattern of microtubules**).
 - **Both**: have a basal body in the cytoplasm (may be derived from centrioles), **9 + 0 pattern**.

- Domain Eukarya...
 - Protists, fungi, plants & animals.
 - Membrane-bounded nucleus houses DNA.
 - Less **SA/V**.