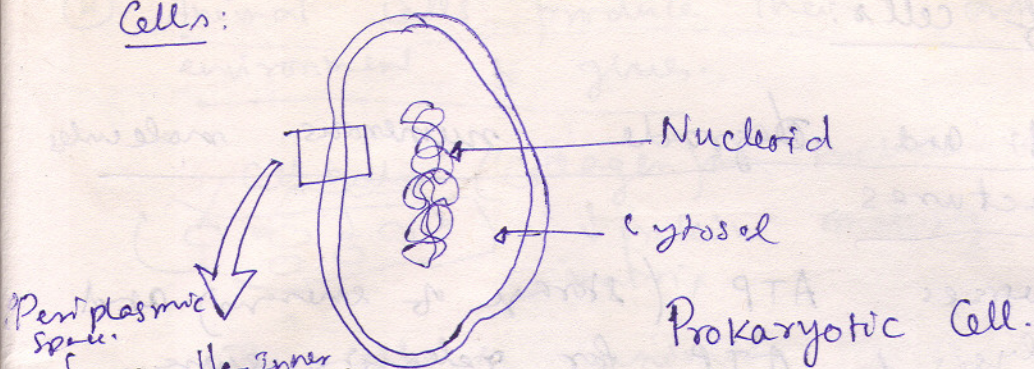
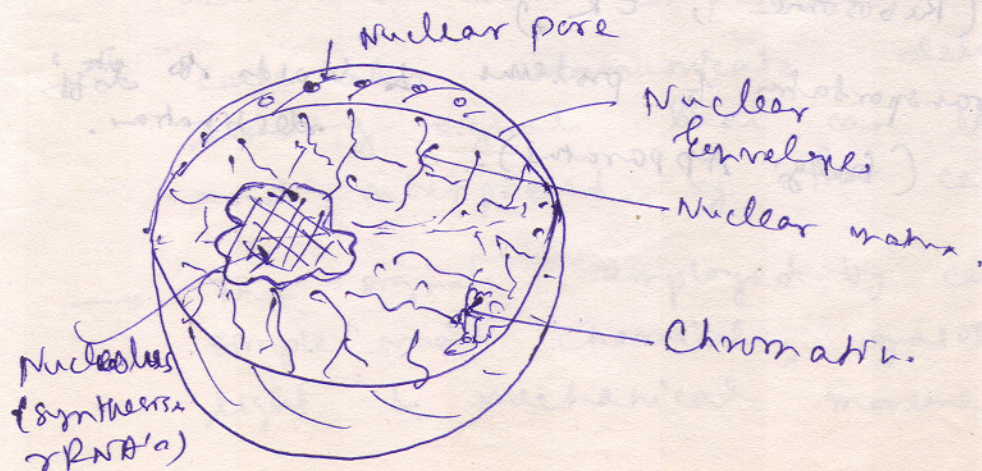
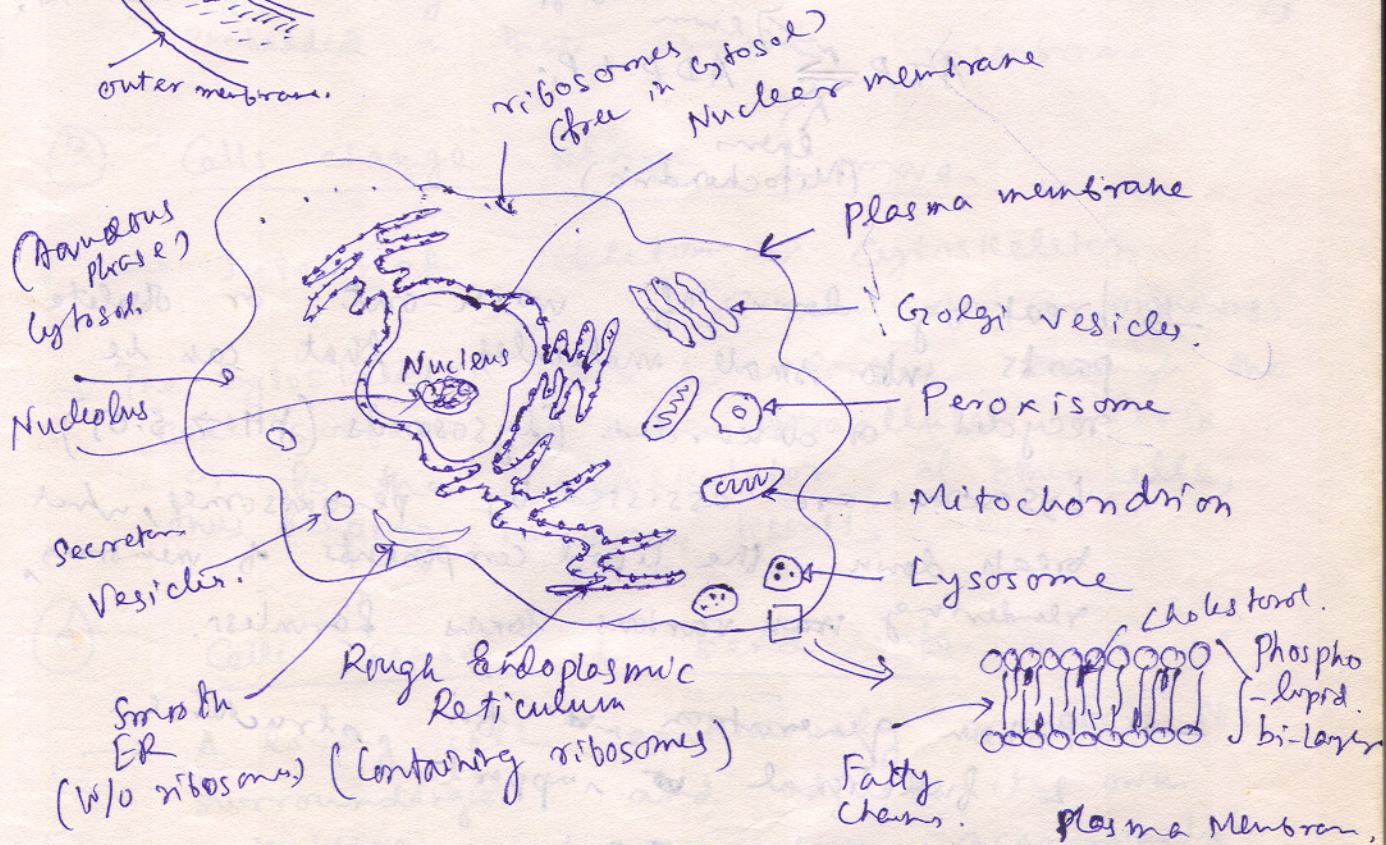


Cells.

Cells:



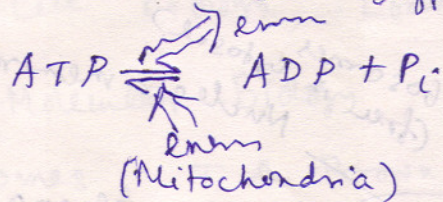
Prokaryotic Cell.



The Work of cells:

① Cells Build and Degrade numerous molecules & structures.

→ synthesizes ATP (storage of energy) and hydrolysis of ATP for releasing energy needed to drive different cellular activities.



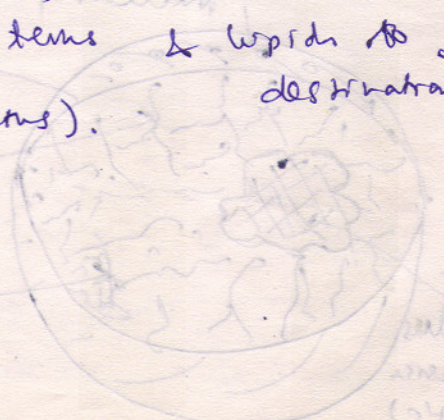
→ breaking down of worn-out or obsolete parts into small molecules that can be recycled or discarded. (lysosomes (pH $\rightarrow$ 5.0))

Lysosomes are assisted by peroxisomes, which break down the lipid components of membranes, rendering ~~various~~ various toxins harmless.

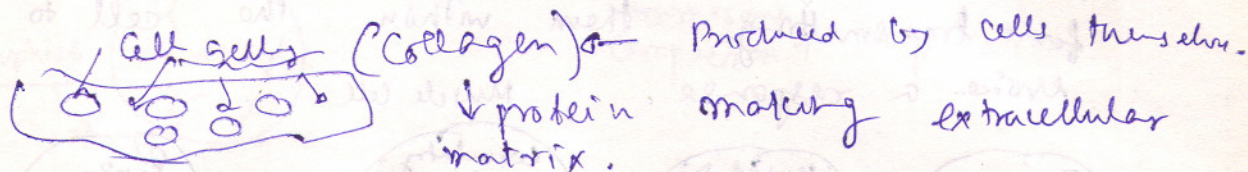
→ Protein generation ~~for~~ for structural & functional ~~support~~ support

→ (Ribosome, ER)

→ Transport of proteins & lipids to ~~the~~ ~~destruction~~ destruction.
(Golgi Apparatus).



- ② Animal Cells produce their own external environment & glue.



The cells in animal tissues are "glued" together by cell adhesion molecules (CAM's), embedded in their surface membrane.

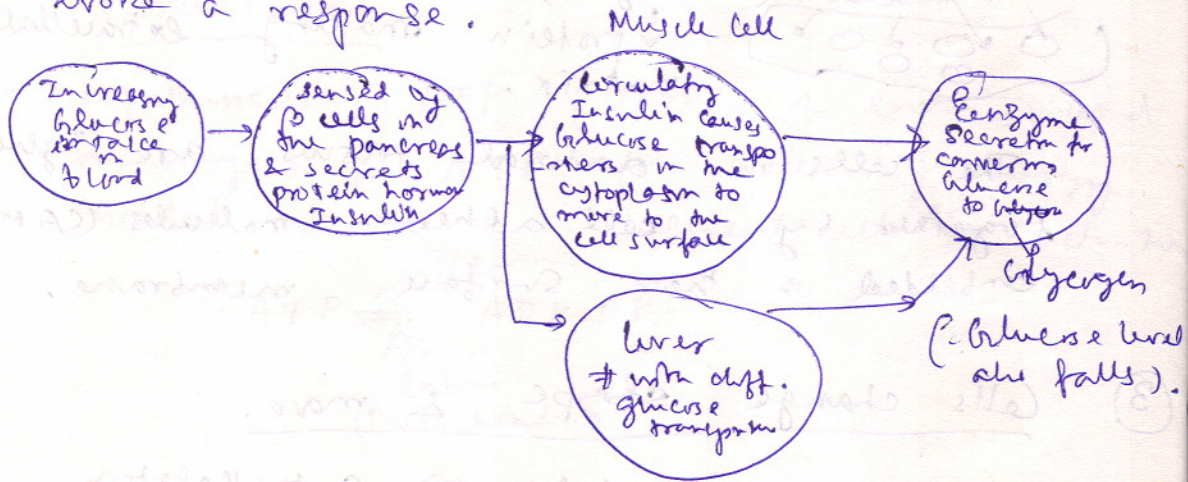
- ③ Cells change shape & move.

- Internal skeleton → Cytoskeleton (made of 3 proteins).
- The Cytoskeleton can be linked through the cell surface to the extracellular matrix or to the cytoskeleton of other cells, thus helping to form tissues.

- ④ Cells sense & send info.

- A living cell continuously monitors its surroundings and adjusts its own activities and composition accordingly.
- Cells also communicate deliberately sending signals that can be received and interpreted by other cells.
- The signals employed by cells include simple small chemicals, gases, proteins, light & mechanical movements.

→ cells possess numerous receptor proteins for detecting signals & elaborate pathways for transmitting them within the cell to evoke a response.



⑤ Cells regulate their Gene Expression to meet changing needs.

→ Control of gene activity in eukaryotic cells usually involves a balance between the actions of transcriptional activators & repressors.

→ Binding of activators to specific DNA regulatory sequences called enhancers turns on transcription.

→ Binding of repressors to other regulatory sequences called silencers turns off transcription.

→ Many external signals modify the activity of transcriptional activators and repressors that control specific genes.

6

Cells Grow & Divide.

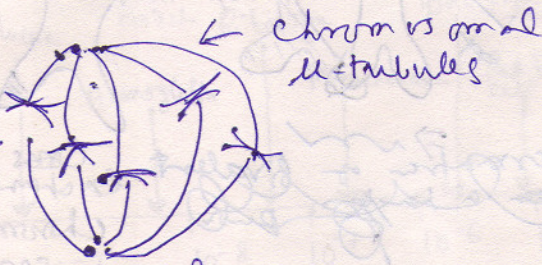
interphase → prophase

Chromosome
compaction + Duplication:

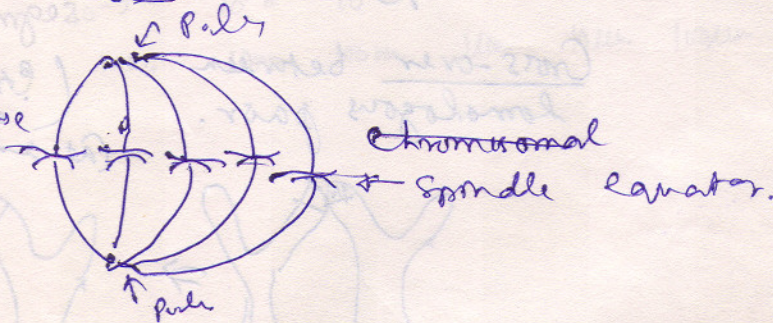
Prophase



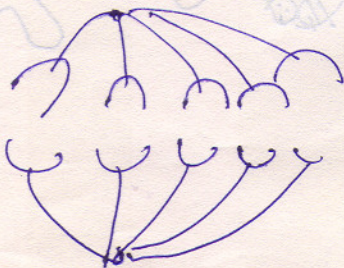
Pro-metaphase



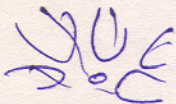
Metaphase



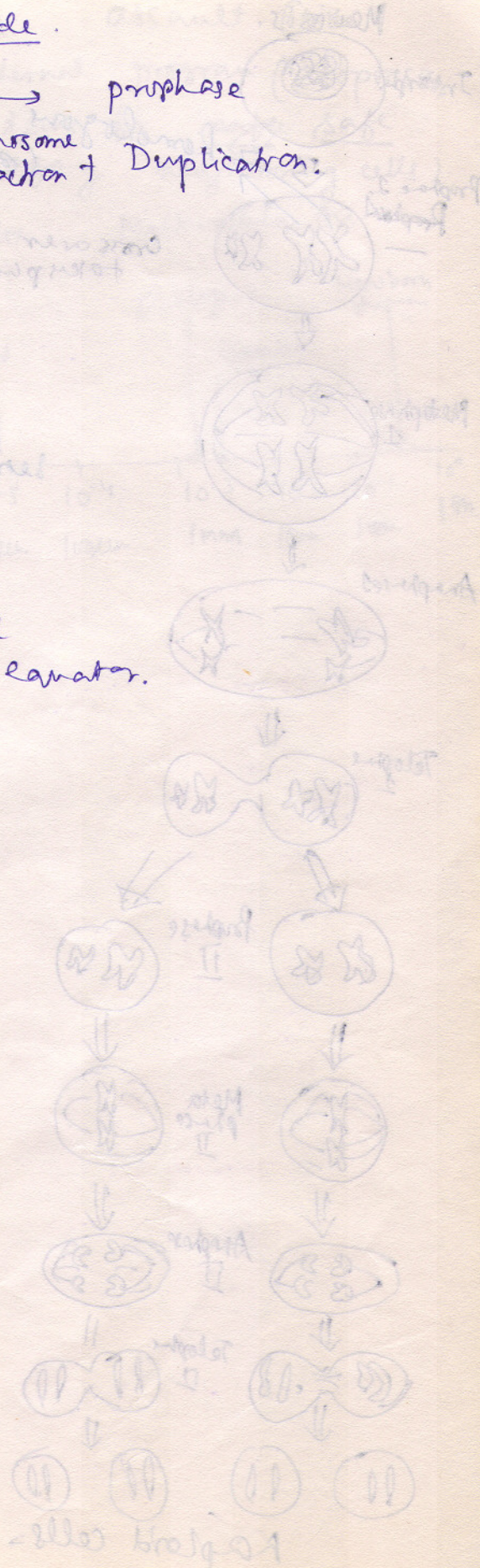
Anaphase



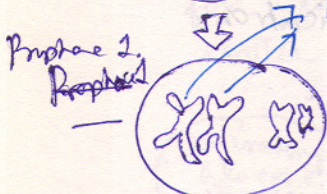
Telophase



Mitosis.



Meiosis



Homologous chromosomes (consist of two separate chromosomes of same type).

Cross over takes place

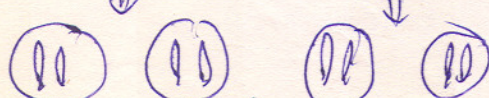
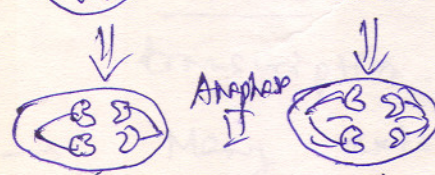
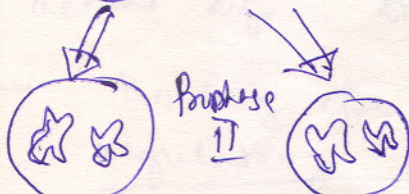
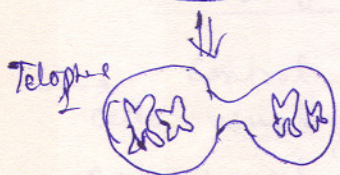
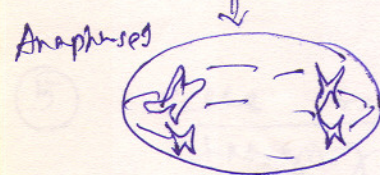
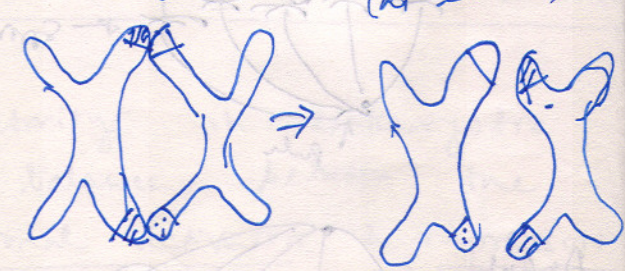


Formation of bivalent between a homologous pair

Cross exchange of chromosome segments.

(Cross over at synapsis)

Cross-over between homologous pair.



Haploid cells

⑦ Cells die from aggravated assault (like virus infection) ~~an~~ an internal program (apoptosis, by producing necessary proteins for safe self-destruction $\Rightarrow$ w/o damaging neighboring cells).

Multicellular Org

