Microtechnique

The art of preparing objects for examination under a microscope from organs, blood smear or from different tissues. **Or** any of various methods of handling and preparing material for microscopic observation and study.

Cytology

The study of plant and animal cells including function and formation their structure.

- Certain cells and tissues may be examined as soon as they are removed from living body which is called (**Biopsy).....**or from death body which is called (**Autopsy).....**
  So blood film , tissue-print, lymph, spleen, bone marrow, scraping from uterus and connective tissue.
- Students must remember that fresh preparations when examined in the living condition don't keep long only after fixation can be preserved.
- We reduce the thickness of the tissue **in order to preserve the relationship between the cells and tissue by cutting the tissue in to thin sections.**

There are three commonly used methods:

A. **Freezing method**: this method can be applied to perfectly fresh tissue just removed from the body.
B. **Paraffin method:** this method first fixation of tissue then many processes must be done in order to prepare amicroscopical slide like dehydration clearing ,infiltration ,blocking, trimming, cutting, mounting and staining.
C. **Celloidin method:** in this method fixed and dehydrated tissues are impregnated with second concentrations of celloidin dissolved in a mixture of absolute alcohol and other clearing agents are required and no heat is used in this process.

After impregnation tissues are embedded in a thick solution of cellulose nitrate. The final consistency of the block being regulated by controlled evaporation of the solvent. The blocks are stored in alcohol.

Advantages of celloidin

1) Considerable reduction in shrinking of tissue.
2) Improved cutting of large blocks of dense tissues such as bone due to hardening.
3) The facility of preparation of section of brain where thick sections are often required.

disadvantages of celloidin

1) The slowness of the method requiring several weeks for complete impregnation and hardeningof the block.
2) Difficult to cut thinner than10 microns.
3) Can not obtain serial sections but single section.
4) Store block in jars of alcohol.

Fixation

It is the process of treating specimens with certain fluids called fixatives.

Aim of fixation: to preserve cells and tissues constituents in a condition identical to that existing during life.

Autolysis: It's self destruction after the death of cell after the death of cells by the actions of intracellular enzymes.

Bacterial decomposition: causes changes in the tissue that are very similar to those of autolysis and cause either presence in the body in life such as the non pathogenic bacteria in the intestine.

Function of the fixation:

1) Inhibit or stop autolysis and bacterial decomposition.
2) To coagulate and harden tissue .
3) To fortify tissue against the harmful effect of tissue processing e.g. dehydration, embedding.....

4) To improve the optical differentiation of tissues .
5) To make easily staining process of tissue.

Note

- The best results are obtained by putting tissues in to fixative as soon after death as possible.....**if this is not possible** should be placed in the refrigerator which slows autolysis and bacterial decomposition.
- The length of fixation time depend on:
  - Rapidly of penetration of the fixative.
  - Thickness of the tissues.

Common fixing agents

I. Fixative agents precipitate protein:

1) Mercuric chloride
2) Picric acid
3) Ethyl alcohol

II. Fixative don't precipitate protein:

4) Formaldehyde.
5) Potassium dichromate.
6) Acetic acid.