Scope of Microtechniques

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Microtechniques

Overview of the lecture

- Introduction to Microtechniques
- Scope of Microtechniques
- Tissue Processing
- Cytological Preparation
- IHC and Special Stains
- Molecular Pathology

…Continued

- Microscopic Examination
- Quality Control and Reasearch

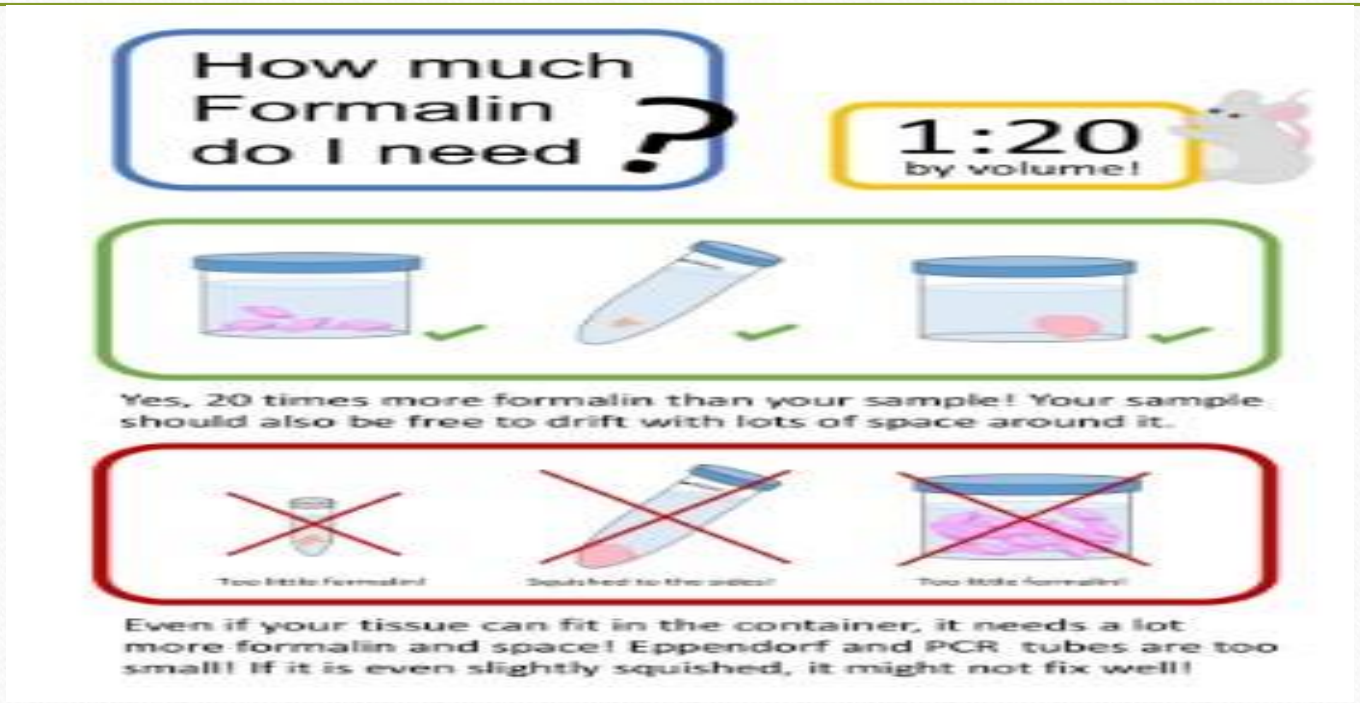
Introduction to Microtechniques

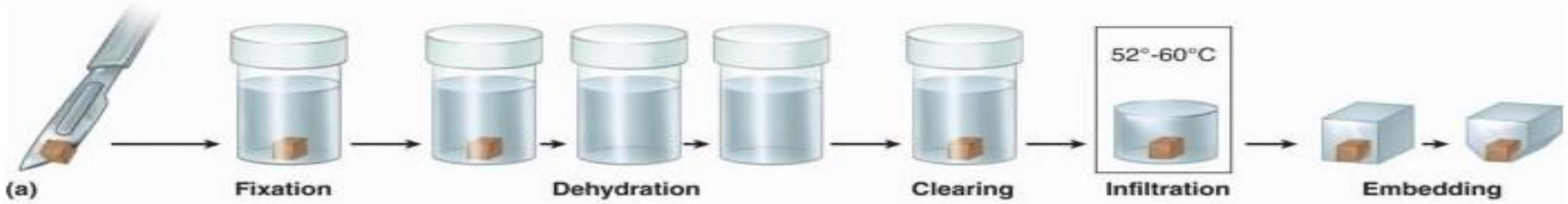
- Microtechniques = small lab methods used in pathology
- Help to prepare and study tissues, cells, and body fluids
- Important for diagnosis, research, and teaching
- Help us understand diseases better

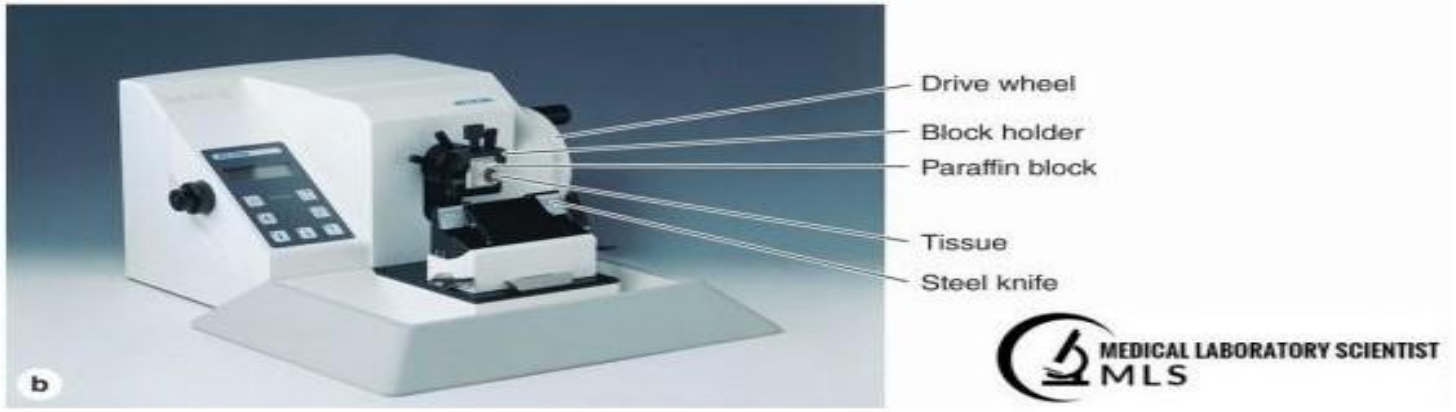
Tissue Processing

- Used to handle tissue samples from surgery, biopsy, or autopsy
- Main steps:
- **Fixation** → preserves tissue
- **Embedding** → keeps tissue firm for cutting
- **Sectioning** → cutting thin slices
- **Staining & Mounting** → adding color and placing on slides for study

Fixation


How much Formalin do I need ?
1:20
by volume!
Yes, 20 times more formalin than your sample! Your sample should also be free to drift with lots of space around it.
Even if your tissue can fit in the container, it needs a lot more formalin and space! Eppendorf and PCR tubes are too small! If it is even slightly squished, it might not fix well!


(a)
Fixation
Dehydration
Clearing
52°-60°C
Infiltration
Embedding


Drive wheel
Block holder
Paraffin block
Tissue
Steel knife
b
MEDICAL LABORATORY SCIENTIST
MLS

Cytological Preparation

- **Cytology** → Study of single cells
- Examples: Pap smears, fluid samples, FNAs (needle samples)
- Helps to detect cancer and infections
- **Special Stains & IHC**
- Show proteins, antigens, and cell structures
- Help doctors confirm diseases

Molecular Pathology

- Focuses on **DNA** and **RNA** (genetic material)
- Common methods:
- **PCR** (copying DNA)
- **FISH** (seeing genes with fluorescent colors)
- **Immunofluorescence** (using glowing antibodies)
- Useful for detecting genetic and infectious diseases

Microscopic Examination

- Uses different microscopes to look at tissues and cells:
  - Light microscope
  - Fluorescent microscope
  - Electron microscope
  - Digital imaging systems
- Helps to see cell details, abnormalities, and disease signs

Quality Control & Research

- Making sure lab work is correct and reliable
- Includes:
  - Maintaining equipment
  - Improving lab methods
  - Checking test accuracy
  - Doing experiments for better results

Next Lecture

- Relationship with other branches of pathology
- Branches of pathology enhanced by Microtechniques

Any Questions?

THANK
YOU