

INTRODUCTION OF HISTOLOGY

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Objectives

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- Preparation of tissue for study
 - ⊙ Fixation
 - ⊙ Embedding & Sectioning
 - ⊙ Staining
- Microscope
 - ⊙ Light Microscope
 - ⊙ Electron Microscope
- Cell tissue culture

CELL????

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Cells are the basic structural and functional units,
the smallest living parts of the body



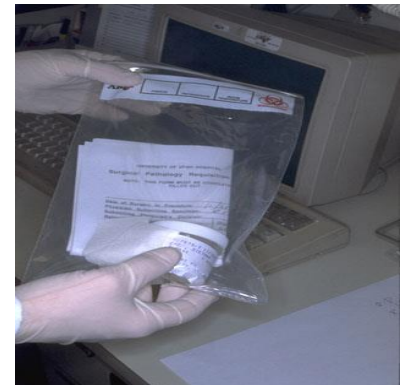
TISSUE ???? ORGANS ???

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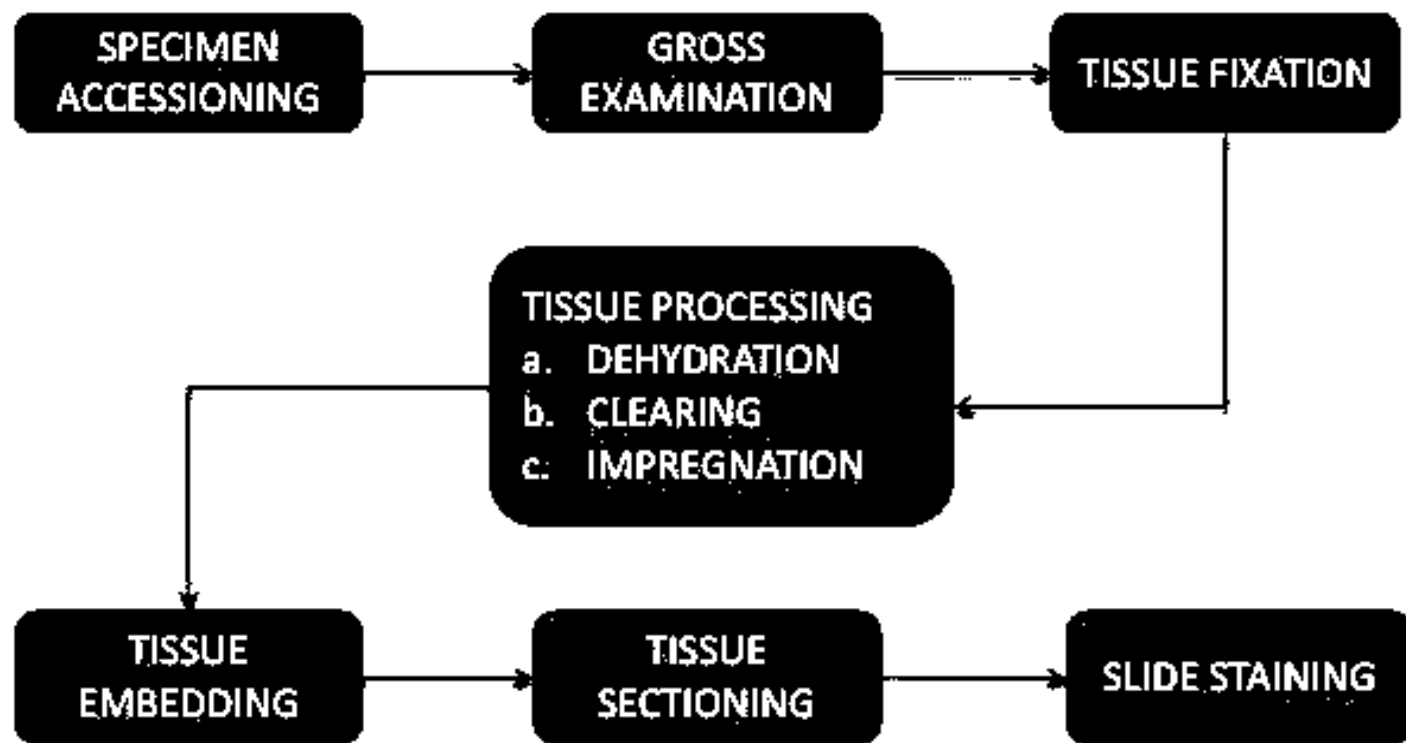
- Cells and extracellular material together comprise all the tissues
- Tissues make up the organs of multicellular animals.

Introduction

- There are 3 main techniques which are used in preparing microscopical sections from tissues:
- The paraffin technique (It is the most **common** method)
- The celloidin technique (It is the most **perfect** method)
- The freezing technique (It is the most **rapid** method)

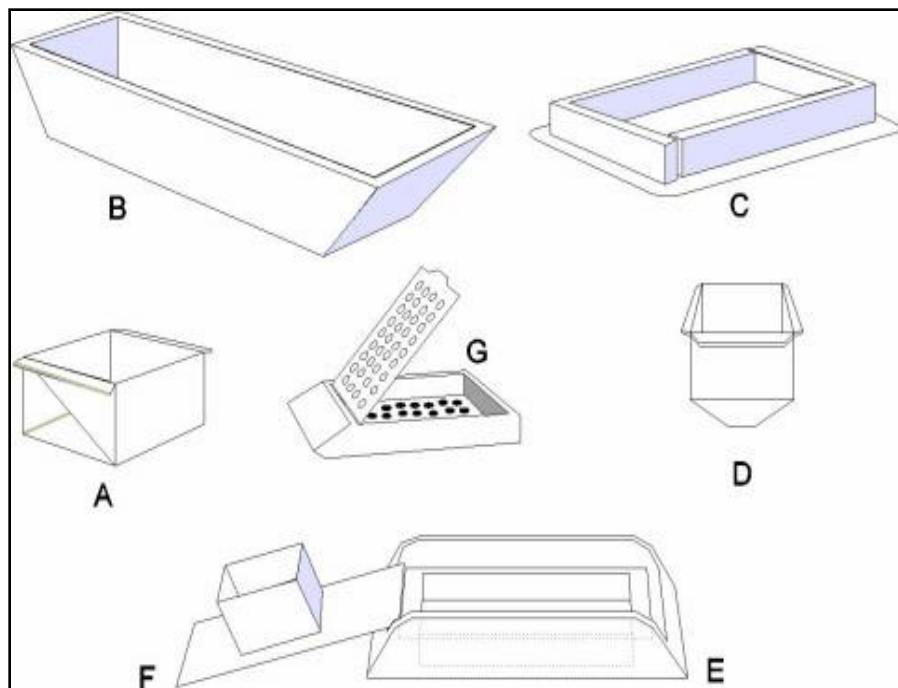


HISTOLOGY PROCEDURE



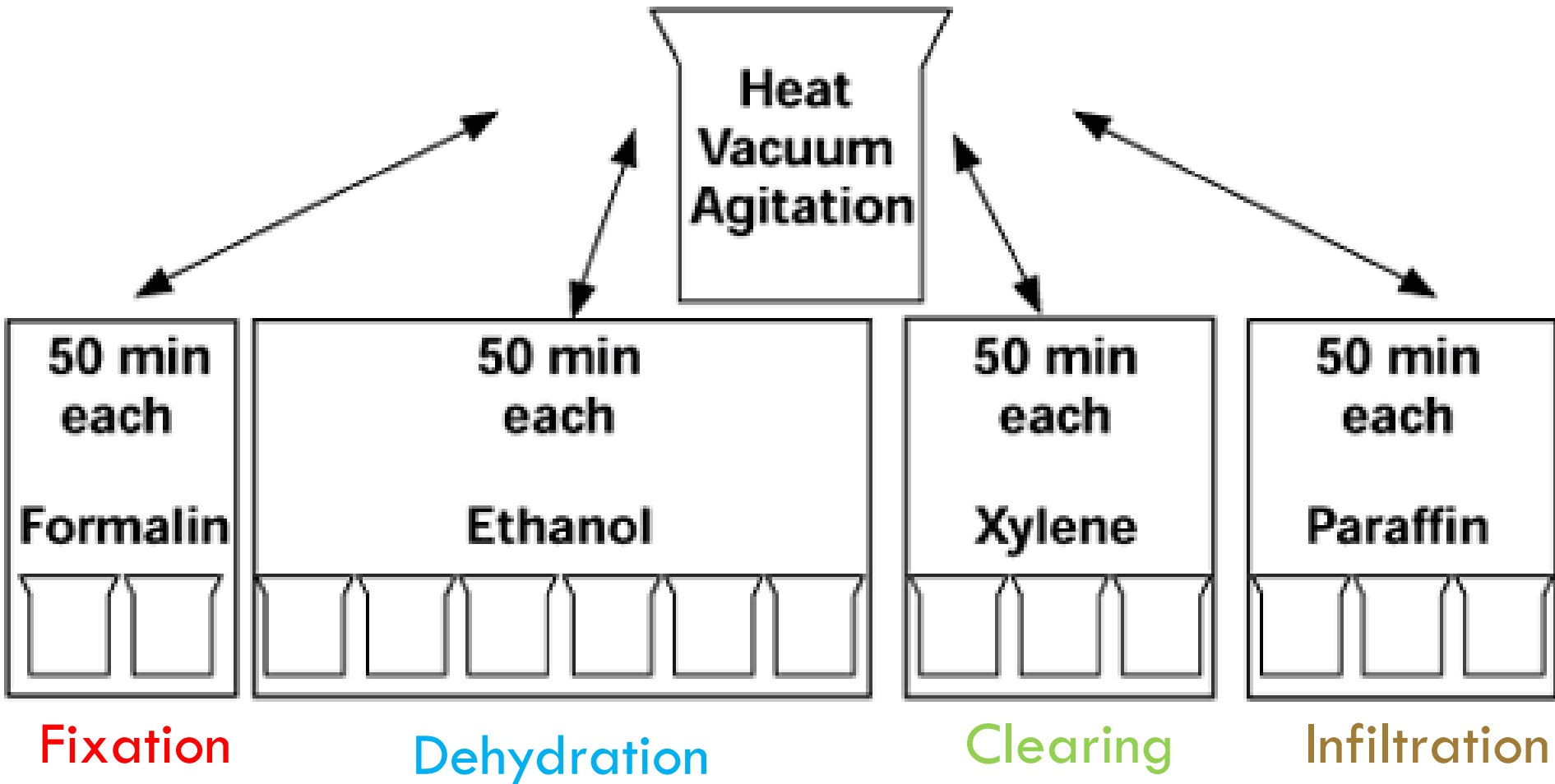
TISSUE FIXATION

- **Fixation** is a complex series of chemical events that differ for the different groups of substance found in tissues.
- **The aim of fixation:**
 - 1- To prevent autolysis and bacterial attack.
 - 2- To fix the tissues so they will not change their volume and shape during processing.
 - 3- To prepare tissue and leave it in a condition which allow clear staining of sections.
 - 4- To leave tissue as close as their living state as possible, and no small molecules should be lost.
- Fixation is coming by reaction between the fixative and protein which form a gel, so keeping every thing as their in vivo relation to each other.



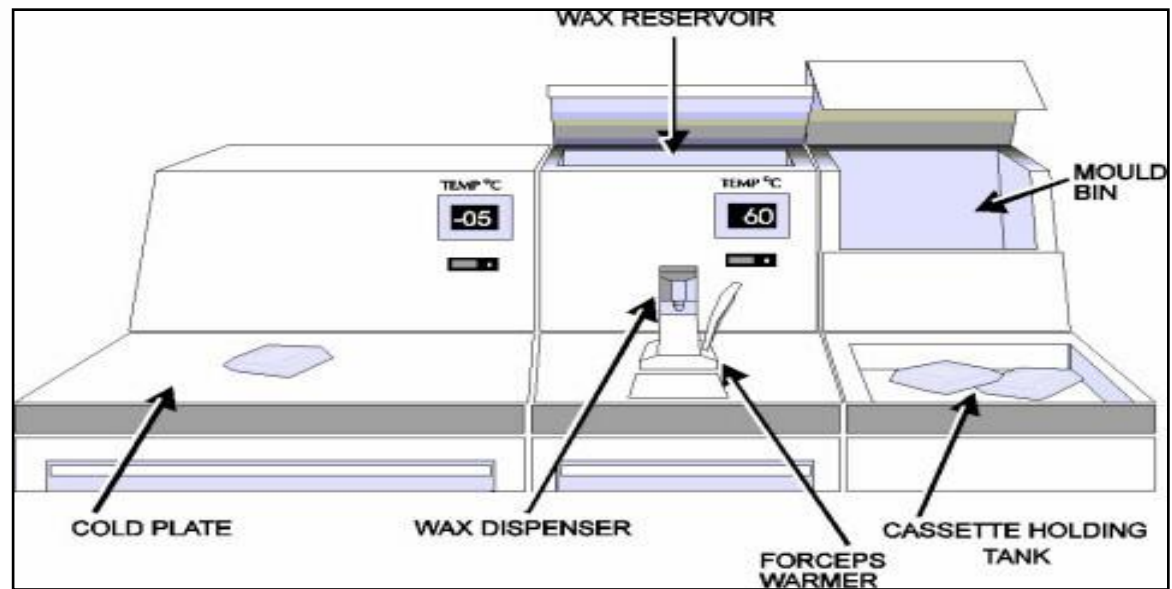
Tissue Processing

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Embedding

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Sectioning using the microtome

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Staining

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Hemotoxylin and Eosin (H&E)

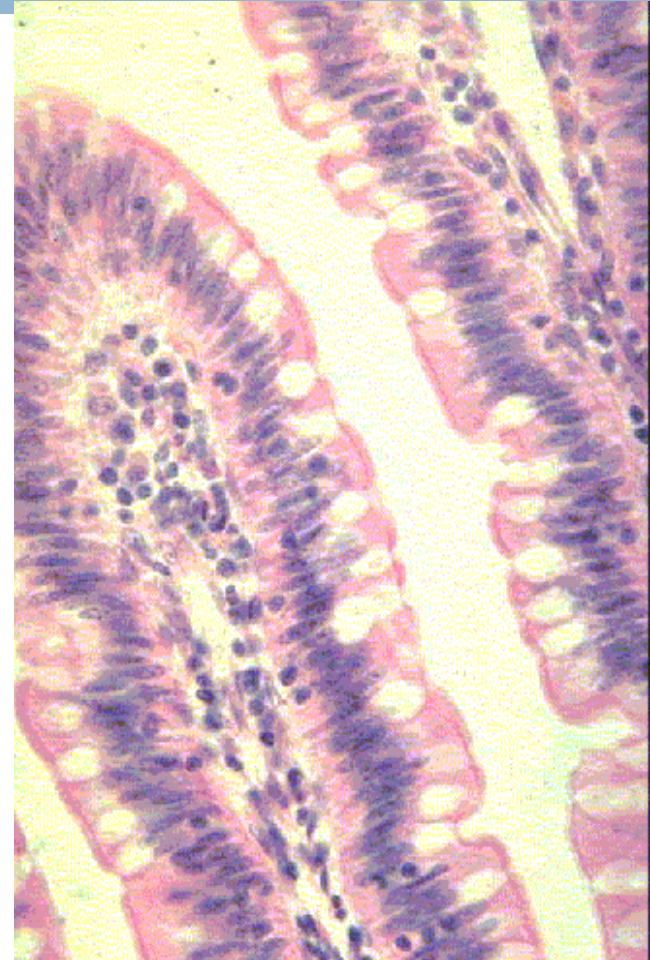
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➤ Hemotoxylin

- ❑ Blue, purple or blackish
- ❑ Stains Basophilic structures ex. DNA, ribosomes, RNA
 - ⊙ Euchromatin is DNA in USE. It is spread out, diffuse, and less stained.
 - ⊙ Heterochromatin is condensed DNA, and stains dark blue.

➤ Eosin

- ❑ Pink
- ❑ Stains Eosinophilic structures ex. Proteins, collagen



Ocular lens (eyepiece)
Remagnifies the image formed
by the objective lens

Body tube
Transmits the image from the
objective lens to the ocular lens

Arm

Objective lenses
Primary lenses that magnify the specimen

Stage
Holds the microscope slide in position

Condenser
Focuses light through specimen

Diaphragm Controls the amount
of light entering the condenser

Coarse focusing knob

Illuminator Light source

Base

Fine focusing knob



(a) Principal parts and functions

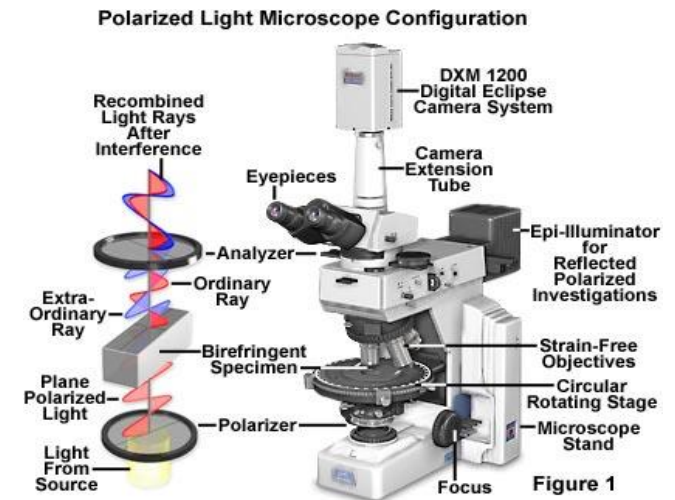
Light Microscope

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Fluorescent

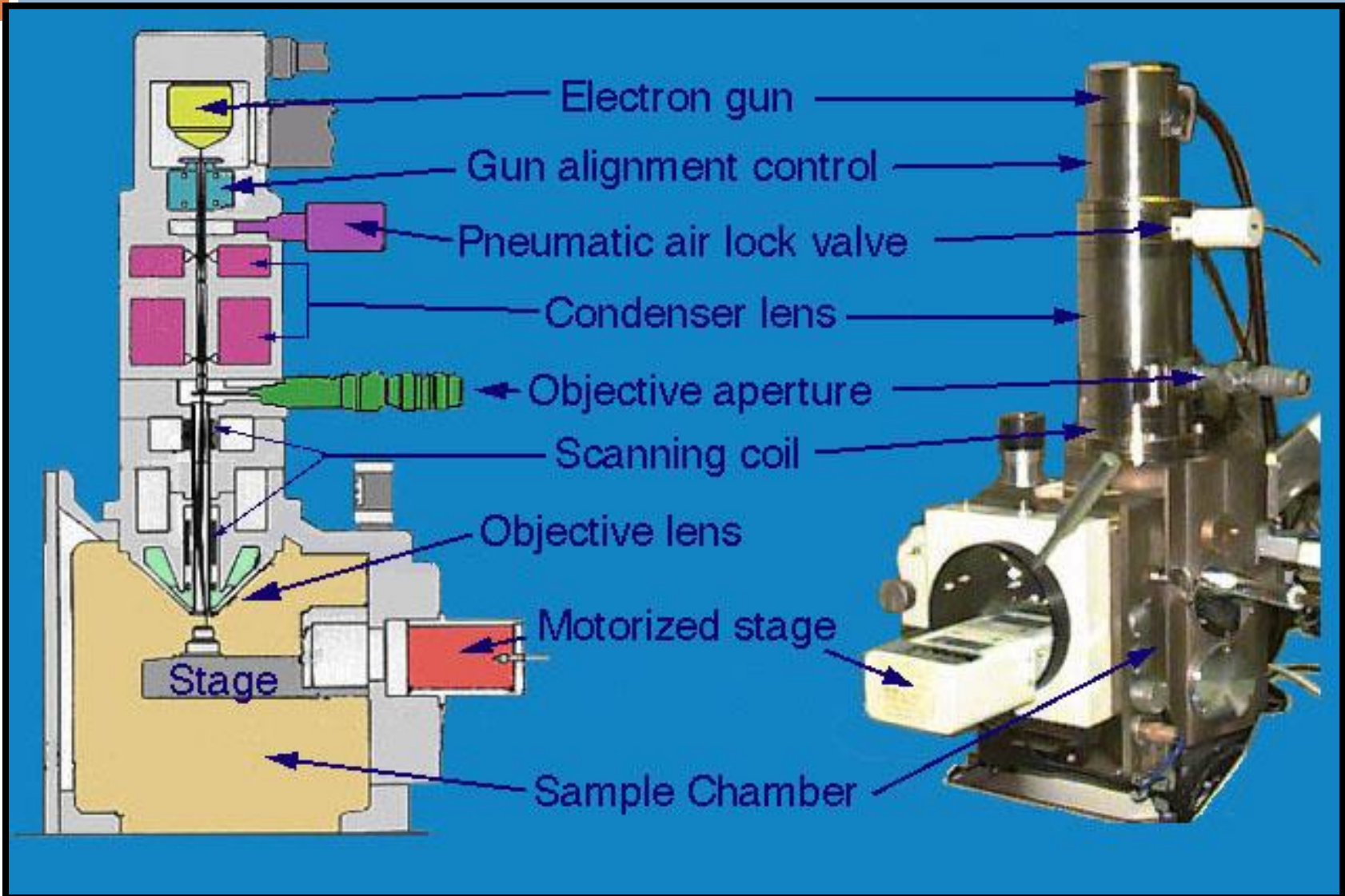
Confocal



Polarized

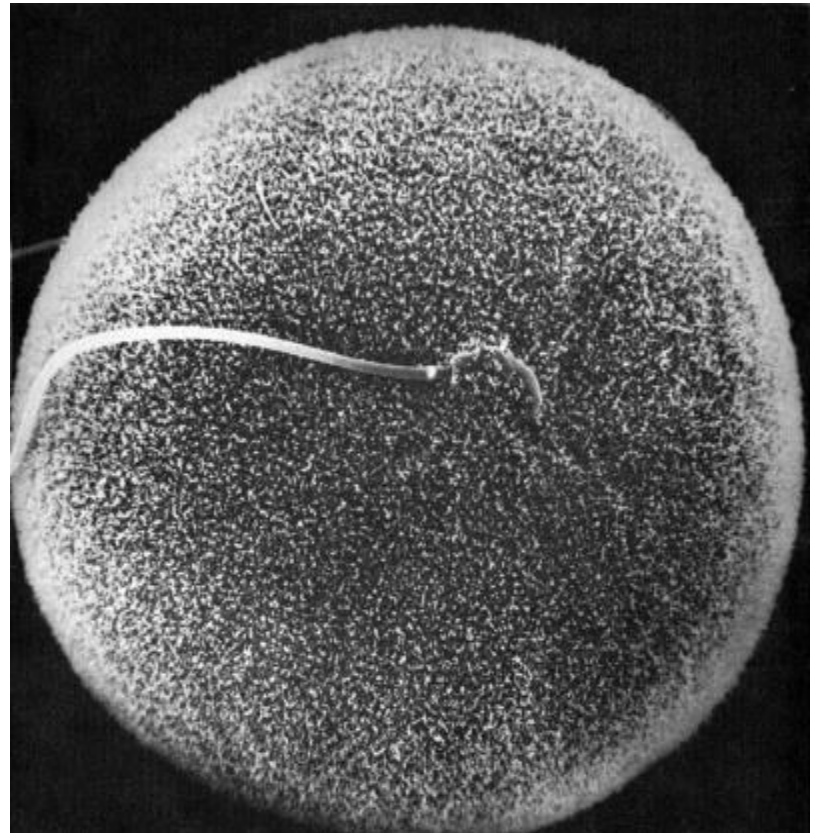
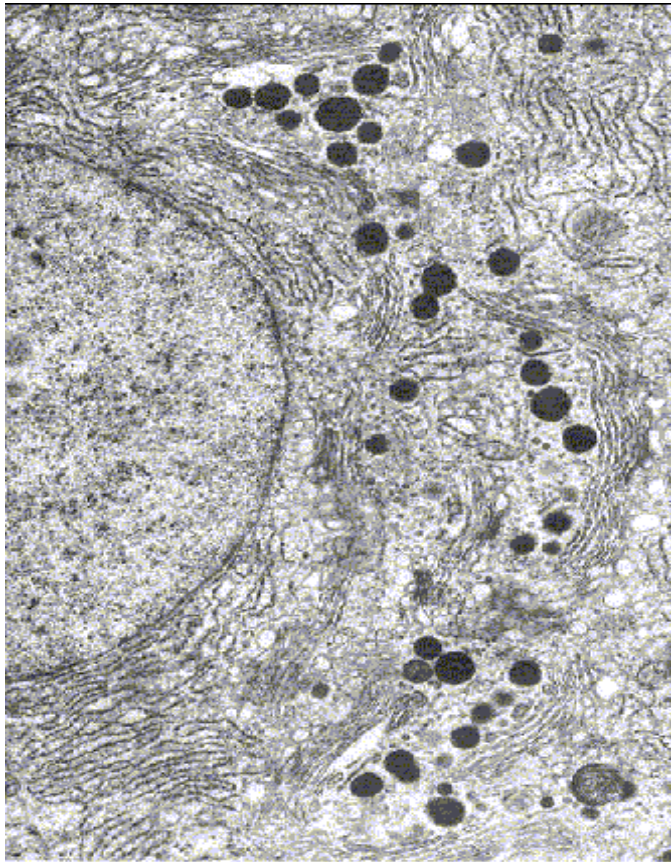
Electron microscope

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Electron Microscopy

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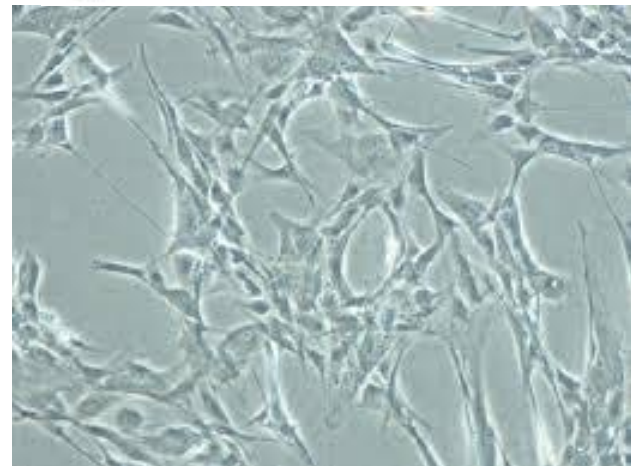


Autoradiography

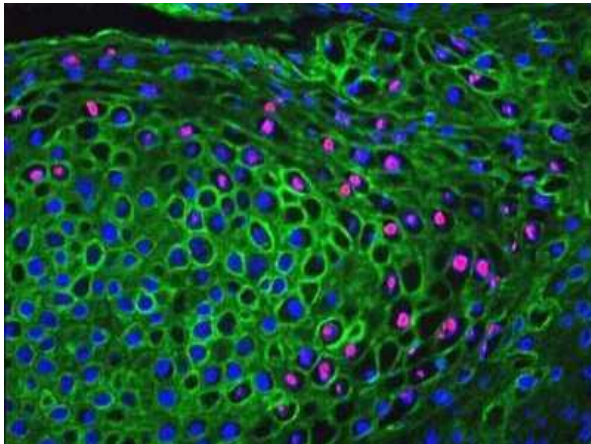
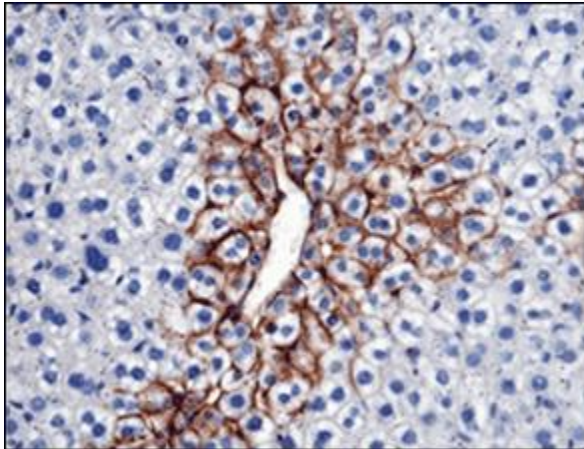


(b)

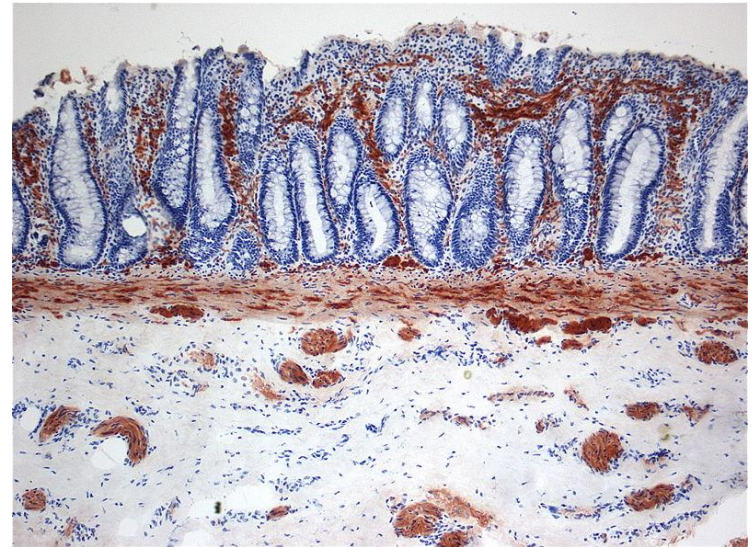
Cell & Tissue culture



Immunohistochemistry



Enzyme Histochemistry



In situ hybridization

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