

# Pathology laboratory

- A **pathology laboratory** is a place where tests are done on clinical specimens in order to get information about the health status of a patient as pertaining to the **diagnosis, treatment, and prevention of disease.**



# ORGANIZATION OF THE PATHOLOGY LABORATORY

Normally a Pathology Laboratory is allocated an area that is proportional to its scope and work load.



# **Laboratory is generally divided into following sections**

- 1. Administrative office**
- 2. A reception unit for registering patients, collection of specimens from the patients and delivery of final laboratory reports.**
- 3. The laboratory area is organized into various sub-units.**

**Normally following major disciplines (units) are created for:**

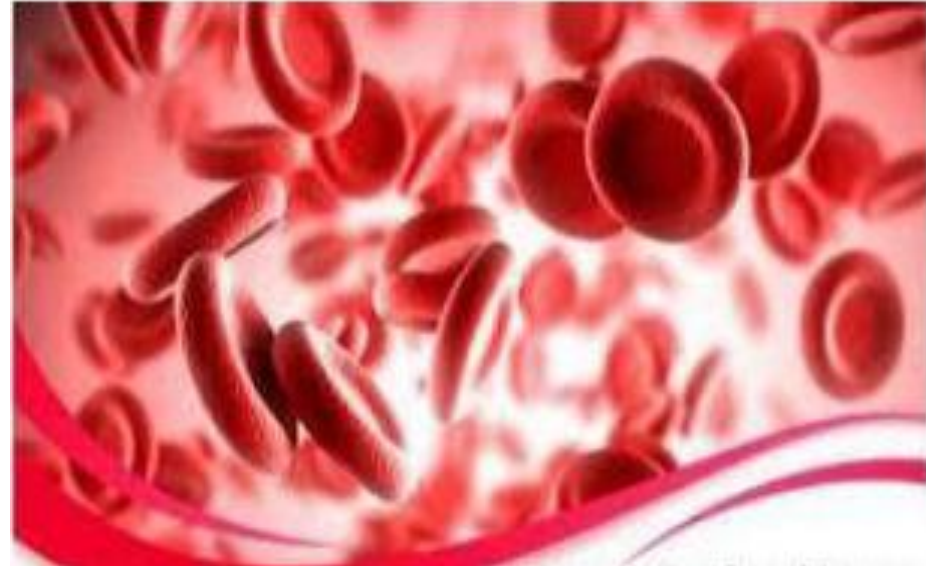
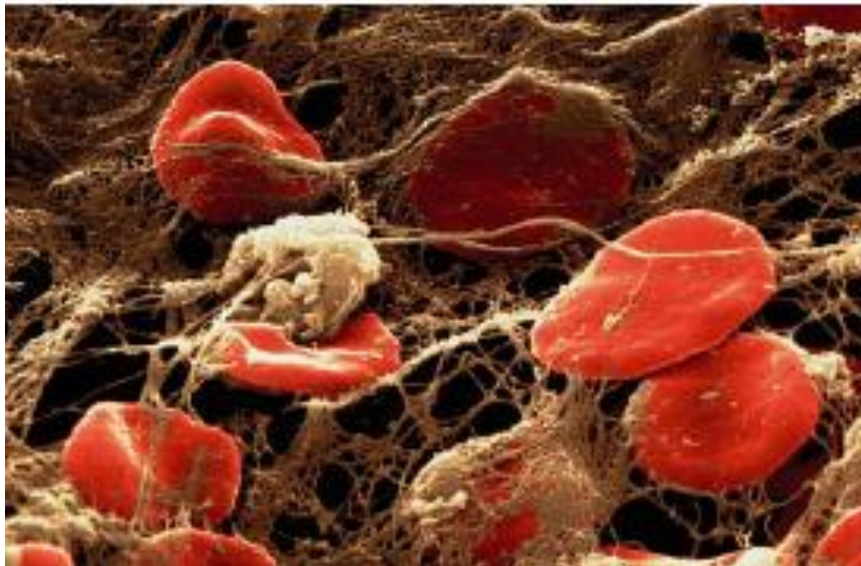
- a. Hematology**
- b. Clinical biochemistry**
- c. Microbiology**
- d. Histopathology**
- e. Virology**
- f. Immunology**
- g. Tissue Typing/HLA**
- h. Medical supply stores**

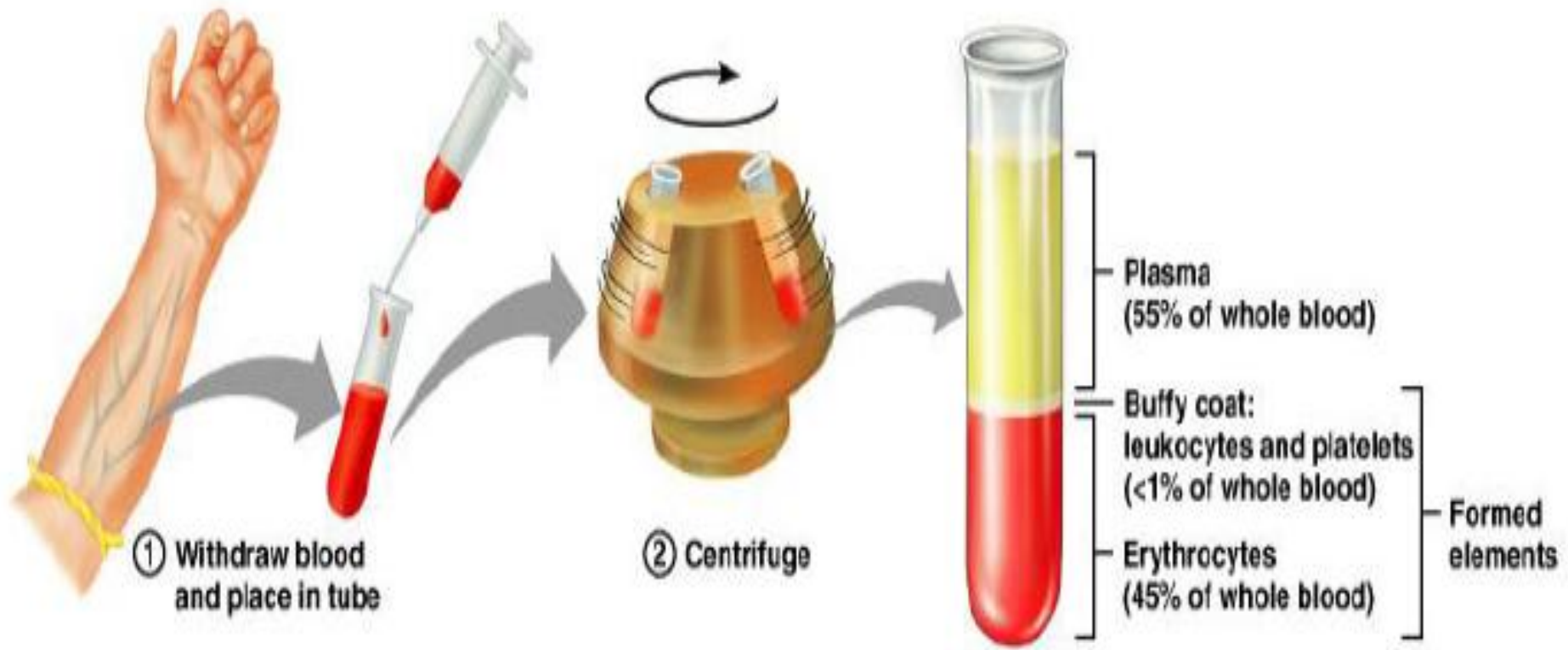
# Responsibilities of each unit

- The following is a detailed breakdown of the responsibilities of each unit:
- Director Lab
- Lab Manager
- Technical supervisor
- Technologist
- Technician

## a) Hematology

- **Hematology:** works with whole blood to do full blood counts (CBC), blood films, bone marrow as well as many other specialized tests.
- Coagulation tests requires citrated blood samples to analyze coagulation profile (PT, APTT) and coagulation factors.







Hematology analyser (black), Centrifuge machine.

## b) Clinical Biochemistry

- **Clinical Biochemistry:** usually receives serum or plasma. They test the serum for substances/chemicals etc present in blood. These include a wide array of substances, such as lipids, blood sugar, enzymes, and hormones.



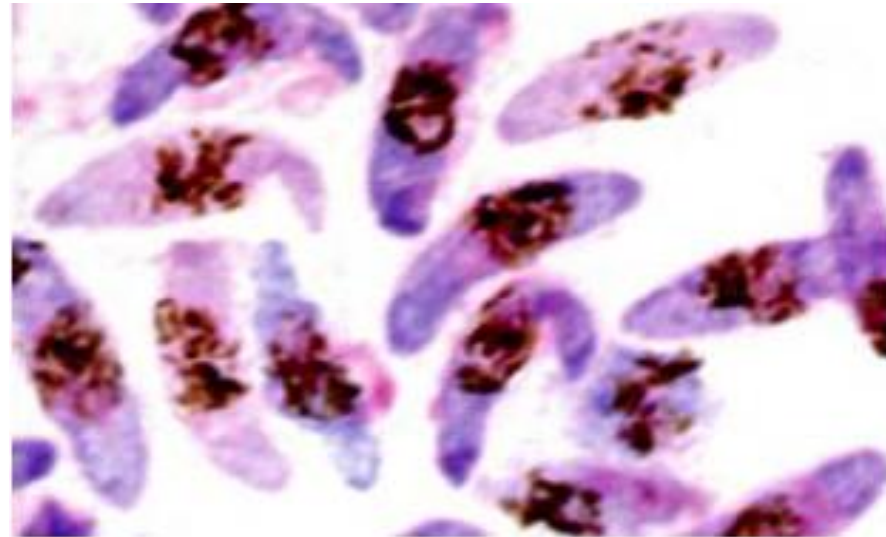


## c) Microbiology

- **Microbiology:** receives almost any clinical specimen, including swabs, feces, urine, blood, sputum, cerebrospinal fluid, synovial fluid, as well as possible infected tissue.
- The work here is mainly concerned with cultures, to look for suspected pathogens which, if found, are further identified based on biochemical tests.
- Also, sensitivity testing is carried out to determine whether the pathogen is sensitive or resistant to a suggested medicine. Results are reported with the identified organism(s) and the type and amount of drug(s) that should be prescribed for the patient.

# Parasitology

- **Parasitology:** is a microbiology unit that investigates parasites. The most frequently encountered specimen here is faeces. However, blood, urine, sputum, and other samples may also contain parasites.



# Virology

- **Virology:** is concerned with identification of viruses in specimens such as blood, urine, and cerebrospinal fluid.



## d) Immunology/Serology

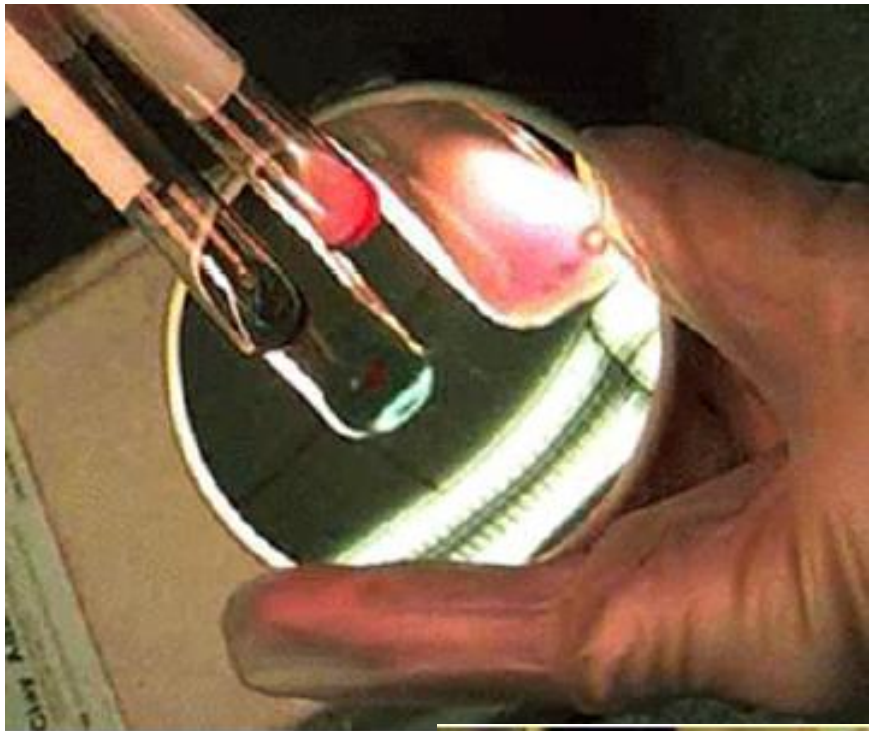
- **Immunology/Serology:** uses the concept of antigen-antibody interaction as a diagnostic tool. Compatibility of transplanted organs (tissue typing) is also determined.



## e) Blood Bank



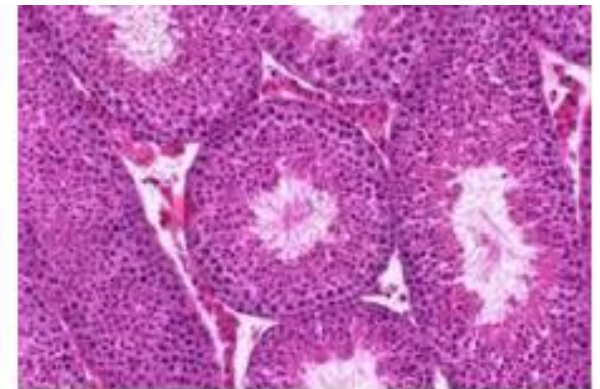
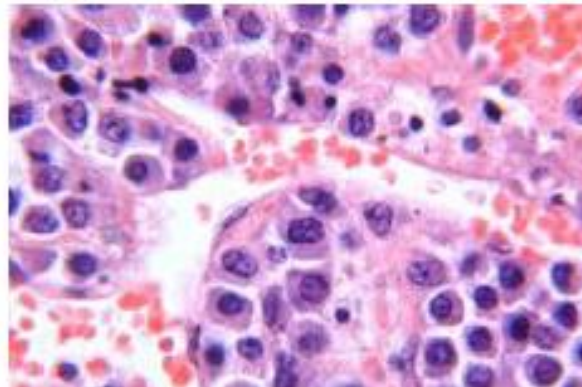
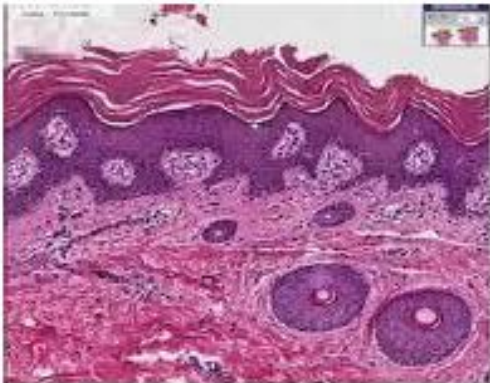
- **Immunohematology, or Blood bank:** determines blood groups, and performs compatibility testing on donor blood and recipients.
- It also prepares blood components, derivatives, and products for transfusion. Regulated by the FDA since giving blood is considered a drug, this unit determines a patient's blood type and Rh status, checks for antibodies to common antigens found on red blood cells, Rh. antibodies titer



# f) Histopathology

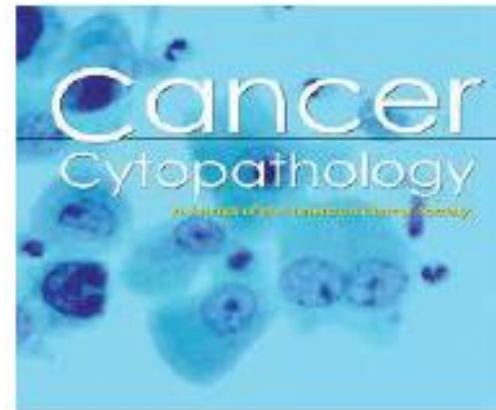
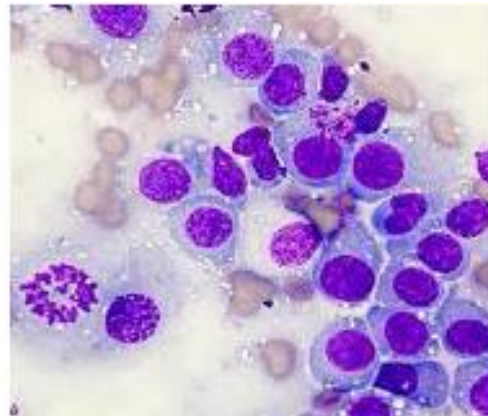
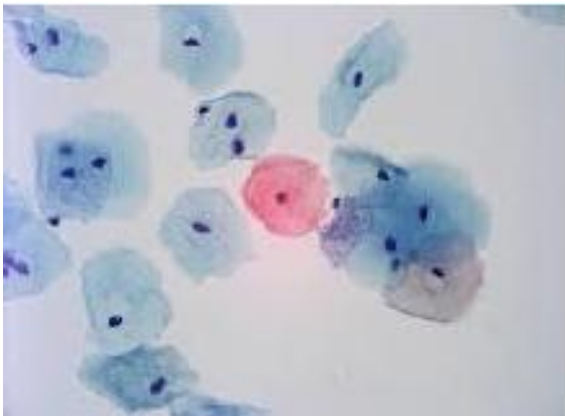


- **Histopathology:** processes solid tissue removed from the body (biopsies) for evaluation at the microscopic level.
- Surgical pathology examines organs, limbs, tumors, fetuses, and other tissues biopsied in surgery such as breast mastectomy.



# Cytopathology

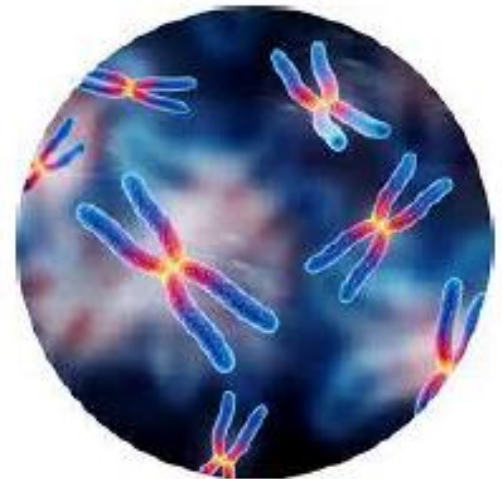
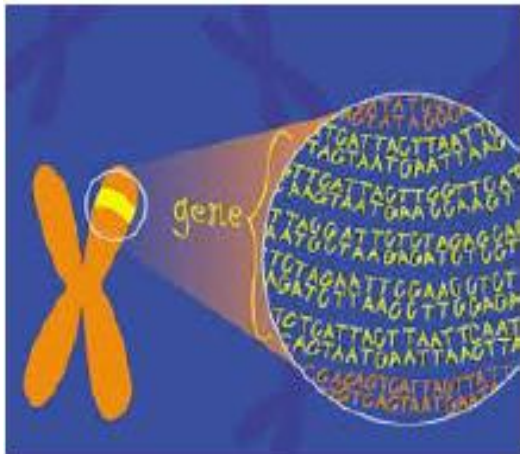
- **Cytopathology** examines smears of cells from all over the body (such as from the cervix) for evidence of inflammation, cancer, and other conditions.
- Electron microscopy prepares specimens and takes micrographs of very fine details by means of TEM and SEM.





# g) Genetics

- **Genetics:** mainly performs DNA analysis.
- **Cytogenetics** involves using blood and other cells to get a karyotype. This can be helpful in prenatal diagnosis (e.g. Down's syndrome) as well as in cancer (some cancers have abnormal chromosomes).



## h) Toxicology

- Toxicology mainly tests for pharmaceutical and recreational drugs. Urine and blood samples are submitted to this lab.



# i) Urinalysis

- **Urinalysis** tests urine for many analytes. Some health care providers have a urinalysis laboratory, while others don't. Instead, each component of the urinalysis is performed at the corresponding unit.
- If measuring urine chemicals is required, the specimen is processed in the clinical biochemistry lab,
- but if cell studies are indicated, the specimen should be submitted to the cytopathology lab, and so on.

