



Medical Laboratory Instruments and Tools 1

Medical laboratory instruments and tools are essential for performing diagnostic tests and research to aid in detecting, diagnosing, and monitoring diseases. Here's an overview of some key categories of instruments and tools commonly found in medical laboratories:

1. Spectrophotometry Instruments

📖 **Spectrophotometer:** Measures the amount of light absorbed by a sample, commonly used in biochemical assays like protein quantification.



2. Hematology Analyzers

📖 **Automated Hematology Analyzer:** Provides a complete blood count (CBC), measures red and white blood cells, platelets, and hemoglobin levels.

📖 **Coagulation Analyzer:** Tests blood clotting functions, essential for monitoring bleeding disorders and anticoagulant therapy.



3.

Biochemistry Analyzers

❑ **Clinical Chemistry Analyzer:** Measures chemical components in body fluids like glucose, enzymes, or electrolytes.

❑ **Blood Gas Analyzer:** Measures the concentration of oxygen, carbon dioxide, and pH levels in blood to assess respiratory and metabolic functions.

4. Molecular Biology Tools

❑ **PCR Machine (Thermocycler):** Amplifies DNA sequences for genetic analysis and diagnostics (e.g., pathogen detection).

5. Microbiology Instruments

❑ **Autoclave:** Sterilizes equipment and media using steam under pressure.

❑ **Incubator:** Maintains optimal conditions (temperature, humidity) for the growth of microorganisms or cells.

6. Immunology Instruments

❑ **Flow Cytometer:** Analyzes the physical and chemical characteristics of cells or particles.

7. Pathology Instruments

❑ **Microtome:** Prepares very thin tissue sections for microscopy analysis.

❑ **Tissue Processor:** Automates the preparation of tissue samples for histopathological examination by fixing, dehydrating, and embedding tissues in wax.

8. Sterilization

❑ **UV Sterilizer:** Uses ultraviolet light to disinfect surfaces and instruments.

❑ **Oven:** use high temperature to sterilize tools



9.

Measuring Tools

☐ **pH Meter:** Measures the acidity or alkalinity of a solution, important in various assays and culture media preparation.

10. Digital Systems and Automation

☐ **Laboratory Information Management System (LIMS):** Software used to track samples, manage workflow, and store data efficiently.

11. Balance (Scale)

☐ **Analytical Balance:** A precise instrument for measuring small masses of substances, critical for preparing reagents and samples.

12. Water Bath

☐ A container filled with heated water used to maintain the temperature of samples for incubation or chemical reactions.