BIOLOGY LABORATORY EQUIPMENT

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Microscopes

A microscope is an instrument that is used to magnify small objects. Some microscopes can even be used to observe an object at the cellular level, allowing scientists to see the shape of a cell, its nucleus, mitochondria, and other organelles. While the modern microscope has many parts, the most important pieces are its lenses. It is through the microscope's lenses that the image of an object can be magnified and observed in detail. A simple light microscope manipulates how light enters the eye using a convex lens, where both sides of the lens are curved outwards. When light reflects off of an object being viewed under the microscope and passes through the lens, it bends towards the eye. This makes the object look bigger than it actually is.

Autoclave

Autoclaves are also known as steam sterilizers, and are typically used for healthcare or industrial applications. An autoclave is a machine that uses steam under pressure to kill harmful bacteria, viruses, fungi, and spores on items that are placed inside a pressure vessel. The items are heated to an appropriate sterilization temperature for a given amount of time. The moisture in the steam efficiently transfers heat to the items to destroy the protein structure of the bacteria and spores.

In healthcare, the term "autoclave" is typically used as the nomenclature to describe a Steam Sterilizer. which provide standards and guidelines for the processing of medical devices, refers to autoclaves for healthcare specifically as Steam Sterilizers.

Hot Air Oven

A hot air oven is a type of dry heat sterilization. Dry heat sterilization is used on equipment that cannot be wet and on material that will not melt, catch fire, or change form when exposed to high temperatures. Moist heat sterilization uses water to boil items or steam them to sterilize and doesn't take as long as dry heat sterilization. Examples of items that aren't sterilized in a hot air oven are surgical dressings, rubber items, or plastic material.

Items that are sterilized in a hot air oven include:

- Glassware (like petri dishes, flasks, pipettes, and test tubes)
- Powders (like starch, zinc oxide, and sulfadiazine)
- Materials that contain oils
- Metal equipment (like scalpels, scissors, and blades)

Hot air ovens use extremely high temperatures over several hours to destroy microorganisms and bacterial spores. The ovens use conduction to sterilize items by heating the outside surfaces of the item, which then absorbs the heat and moves it towards the center of the item.

Hood

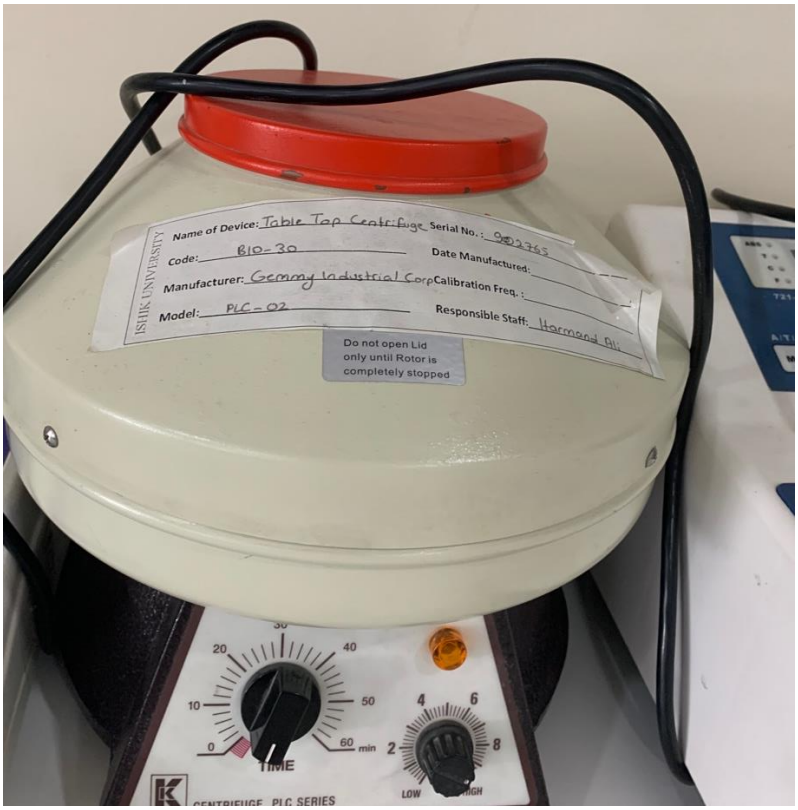
Fume hoods are a form of regulation in environments that are exposed to harmful vapors and fumes. In order to protect people from the harmful effects of these fumes, fume hoods are used to get rid of the harmful aspects and allow the individuals to work safely. Labs use fume hoods when working with substances that let off a harmful fume or odor. Laboratory workers can work with substances directly under the fume hood, or simply place the substance in the fume hood after the work is done.

Laminar Chamber

A laminar flow cabinet is defined as enclosed workbench which is used to create a contamination free work environment through installed HEPA filters that capture all the particles entering the cabinet. A laminar flow hood is used for work with substances which are not hazardous for the personnel health.

Desktop laminar flow chambers, also known as laminar flow clean benches, are similar to biosafety cabinets in the sense that they are equipments used to clean up the ambient air completely through a filtration process. Generally, laminar air flow is designed to prevent the contamination of semiconductor wafers, some sensitive materials, and even biological samples.

Tabletop Centrifuge

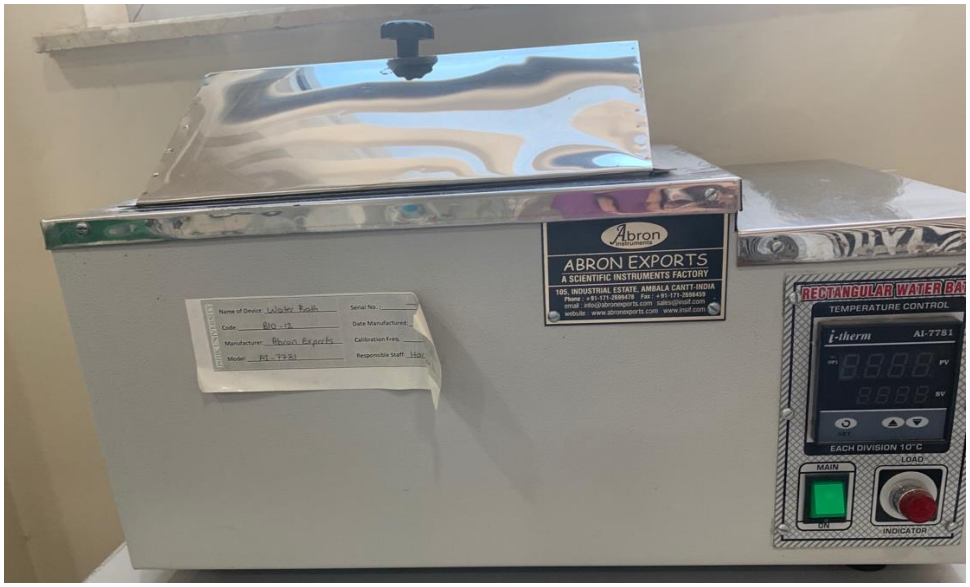


A laboratory centrifuges work on the sedimentation principle, where the centripetal acceleration is used to separate substances of greater and lesser density. The rate of the centrifugation is calculated by the acceleration applied to the sample and it is typically measured in revolution per minute (RPM) or relative centrifugal force (RCF). The particle's settling velocity during centrifugation depends on the function of their size and shape, centrifugal acceleration, the volume fraction of solids present, the density difference between the particle and the liquid, and the viscosity. This centrifuge accommodates a variety of rotors like swing-bucket and high-speed fixed-angle rotors along with a micro plate rotor. These can be used for cell harvesting, separating cell lysates and DNA precipitation. It also provides the cooling mechanism to maintain the uniform temperature throughout the operation of the sample

pH Meter

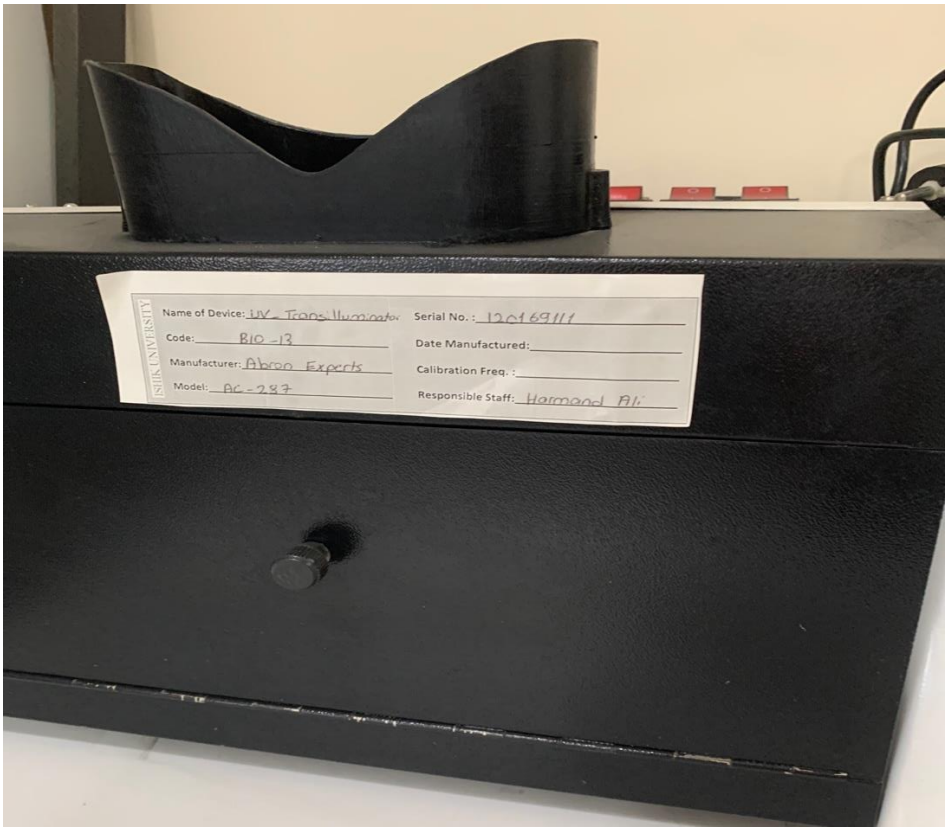
A **pH meter** is a scientific instrument that measures the hydrogen-ion activity in water-based solutions, indicating its acidity or alkalinity expressed as pH. The pH meter measures the difference in electrical potential between a pH electrode and a reference electrode, and so the pH meter is sometimes referred to as a "potentiometric pH meter". The difference in electrical potential relates to the acidity or pH of the solution. The pH meter is used in many applications ranging from laboratory experimentation to quality control.

Water bath



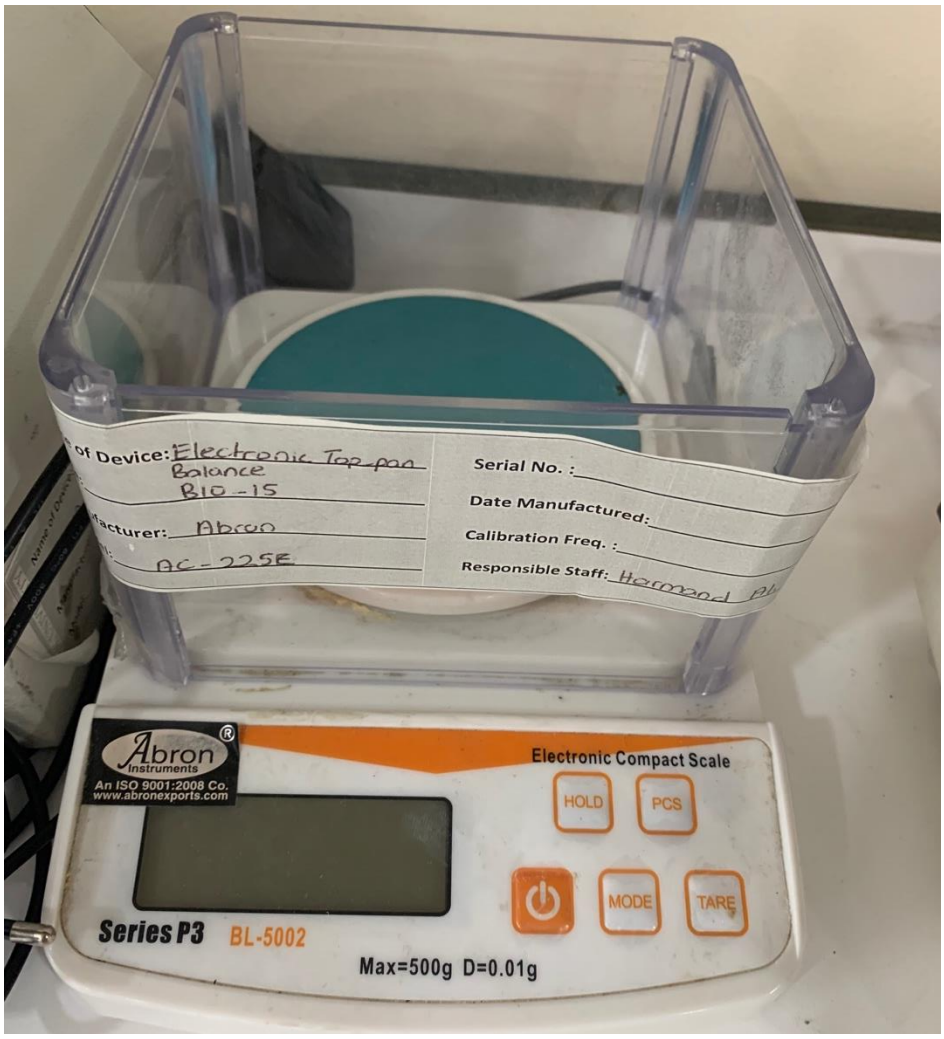
A **water bath** is laboratory equipment made from a container filled with heated water. It is used to incubate samples in water at a constant temperature over a long period of time. Most water baths have a digital or an analogue interface to allow users to set a desired temperature, but some water baths have their temperature controlled by a current passing through a reader. Utilisations include warming of reagents, melting of substrates or incubation of cell cultures. It is also used to enable certain chemical reactions to occur at high temperature. Water bath is a preferred heat source for heating flammable chemicals instead of an open flame to prevent ignition. Different types of water baths are used depending on application. For all water baths, it can be used up to 99.9 °C. When temperature is above 100 °C, alternative methods such as oil bath, silicone bath or sand bath may be used.

UV Transilluminator



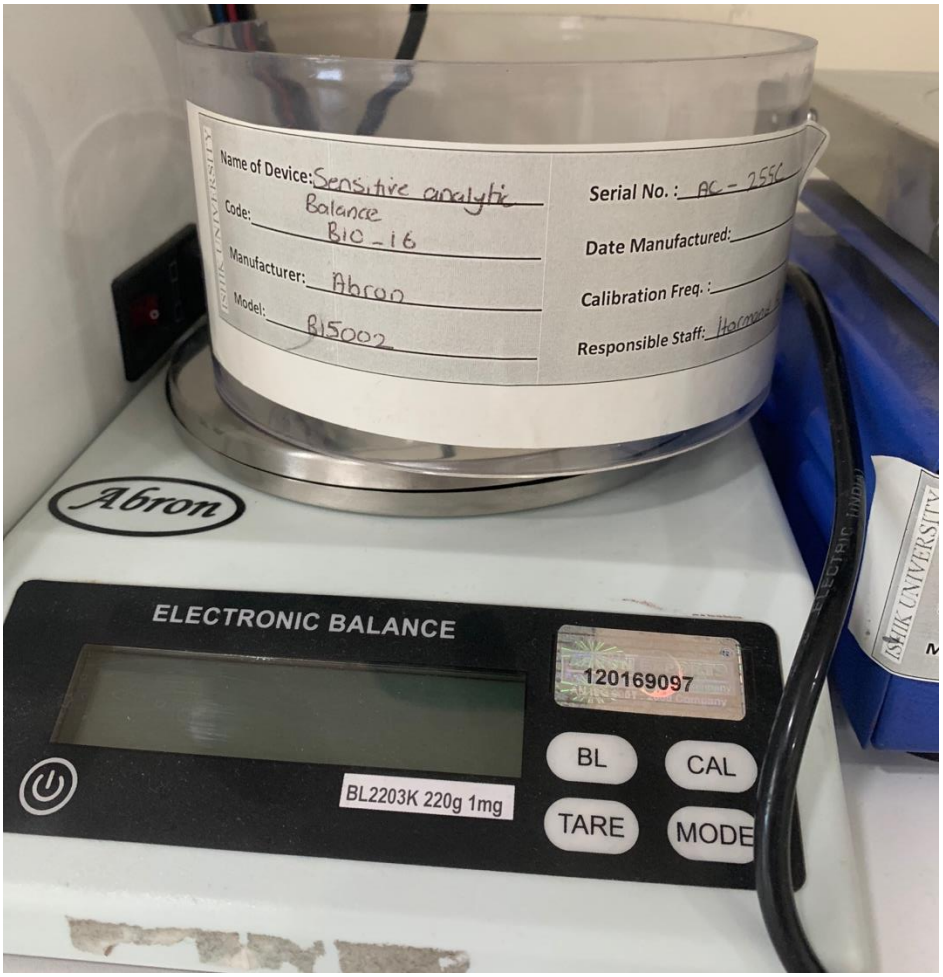
An ultra-violet (UV) transilluminator is a standard piece of equipment used in life science laboratories for visualization of target DNAs and proteins. The UV transilluminator works by emitting high levels of UV radiation through the viewing surface. The key application for a UV transilluminator is for visualization of DNA and protein agarose and polyacrylamide gels after electrophoresis. Gels can be directly placed onto the UV transilluminator; wavelength will vary on your particular application.

Top Pan Balance



The term *Top Pan Balance or Top Loading Balance* refers to weighing scales and balances that have a pan that is not enclosed by the body of the machine. Top pan balances commonly attach the weighing plate to the top of the balance and relates to machines that have a resolution not requiring a draft shield to protect the weighing surface.

Sensitive Analytical Balance



Analytical balances are precision measuring instruments used in quantitative chemical analysis, to determine the mass of solid objects, liquids, powders and granular substances.
The precise measurements offered by an analytical scale makes it a critical piece of equipment for any sector that relies on quantitative chemical analysis. They are available in various shapes and sizes and can display readouts in various units, making them suitable for a wide range of industry applications.These include pharmaceutical, food, plastics and chemical manufacturing, quality assurance labs and calibration laboratories, etc. No matter what type of analytical method you use, analytical balance precision and accuracy are essential for weighing samples as well as reagents for solution preparation.

Test Tube Holder (rack)

Test tube racks are laboratory equipment used to hold upright multiple test tubes at the same time. They are most commonly used when various different solutions are needed to work with simultaneously, for safety reasons, for safe storage of test tubes, and to ease the transport of multiple tubes. Test tube racks also ease the organization of test tubes and provide support for the test tubes being worked with.

Micropipette

A micropipette is a common yet an essential laboratory instrument used to accurately and precisely transfer volumes of liquid in the microliter range. Micropipettes are available in single channel and multi channel variants. While the single channel micropipettes are used in labs that perform research related to molecular biology, microbiology, immunology, cell culture, analytical chemistry, biochemistry and genetics, the multichannel micropipettes are recommended for ELISA (diagnostic test), molecular screening, kinetic studies and DNA amplification.

Manual pipetting pump

Manual pipette pumps feature a thumbwheel for precision filling or dispensing of liquids. Insert glass or plastic pipettes into secure tapered collar and quickly dispense liquid by depressing white side bar or plunger. Operate easily with one hand. Economical choice for accurate dispensing Resists acids and alkalis. Color coded for easy identification. Unit disassembles for easy cleaning.

Prepared slides

Prepared microscope slides have professionally prepared samples already set in between the glass. They typically come in sets with categorized or broad-spanning slides for learning and teaching biology, pathology, zoology, anatomy, and many more sciences.

Petri dish

Petri dish is a shallow, circular, glass or plastic dish with a loose-fitting cover over the top and sides, used for culturing bacteria and other microorganisms.

Test tubes

A **test tube**, also known as a **culture tube** or **sample tube**, is a common piece of laboratory glasswareconsisting of a finger-like length of glass or clear plastic tubing, open at the top and closed at the bottom.

Micro tubes

Microtubes are ideal for applications requiring tubes to be incubated, the use of radioactive molecules, or any DNA/protein research where sample integrity is important. Microtubes are autoclavable multiple times and are highly economical for the service they provide, and microtubes are easy to read with graduations at varying amounts in milliliters. Caps can either be screw-on or attached to the microcentrifuge tubes for easy popping on, and even pop-on caps are immune to popping off during intense centrifugation. Available in conical- or flat-bottomed designs.

Microscopic slide

A **microscope slide** is a thin flat piece of glass, typically 75 by 26 mm (3 by 1 inches) and about 1 mm thick, used to hold objects for examination under a microscope. Typically the object is mounted (secured) on the slide, and then both are inserted together in the microscope for viewing. This arrangement allows several slide-mounted objects to be quickly inserted and removed from the microscope, labeled, transported, and stored in appropriate slide cases or folders etc.

Flasks

Laboratory flasks are vessels or containers that fall into the category of laboratory equipment known as glassware. In laboratory and other scientific settings, they are usually referred to simply as **flasks**. Flasks come in a number of shapes and a wide range of sizes, but a common distinguishing aspect in their shapes is a wider vessel "body" and one (or sometimes more) narrower tubular sections at the top called **necks** which have an opening at the top. Laboratory flask sizes are specified by the volume they can hold, typically in metric units such as milliliters (mL or ml) or liters (L or l). Laboratory flasks have traditionally been made of glass, but can also be made of plastic.

Cylinders

Cylinders, used in the lab to measure the volume of a liquid, are manufactured from glass or plastic and may feature graduations to aid in determining volume. Cylinders may come with a hexagonal base or fused round base for stability and to prevent spilling. Cylinders are generally considered more accurate than beakers and flasks for measurement purposes but are not recommended for volumetric analysis. Borosilicate glass cylinders provide ideal durability and corrosion resistance, while plastic cylinders are noted for their impact and chemical resistance and can be autoclaved. Plastic cylinders also do not form a meniscus, allowing liquids to remain level for measuring purposes.

Glass pipettes

A **glass pipette** is a pipette with its volume, in increments, marked along the tube. It is used to accurately measure and transfer a volume of liquid from one container to another.[1] It is made from plastic or glass tubes and has a tapered tip. Along the body of the tube are graduation markings indicating volume from the tip to that point. A small pipette allows for more precise measurement of fluids; a larger pipette can be used to measure volumes when the accuracy of the measurement is less critical.

Bunsen burner

A Bunsen burner is a type of gas burner commonly used as a heat source in laboratory experiments. The burner consists of a flat base with a straight tube extending vertically, known as the barrel or chimney. Natural gas (predominantly methane) or a liquified petroleum gas such as propane or butane is supplied at the bottom of the chimney.

Loop

An inoculation loop, also called a smear loop, inoculation wand or microstreaker, is a simple tool used mainly by microbiologists to pick up and transfer a small sample (inoculum) from a culture of microorganisms, e.g. for streaking on a culture plate.

Needle

An inoculation **needle** is a **laboratory** equipment used in the field of microbiology to transfer and inoculate living microorganisms. It is one of the most commonly implicated biological **laboratory**tools and can be disposable or re-usable.

L shape glasses

A cell spreader or plate spreader is a hand tool used in biology and related fields to smoothly spread cells and bacteriaon a culture plate, such as a Petri dish.

Cell spreaders can be made from glass, plastic, or metal, and come in various shapes.

A Drigalski spatula is a cell spreader consisting of a cylindrical rod or wire bent in the shape of a triangle with a handle. Another variant is a rod bent in L-shape. Extrusion molded versions can be T-shaped.

Autoclave tape

Autoclave tape is an adhesive tape used in autoclaving (heating under high pressure with steam to sterilise) to indicate whether a specific temperature has been reached. Autoclave tape works by changing color after exposure to temperatures commonly used in sterilization processes, typically 121°C in a steam autoclave.

Wrapping Foil

Consumables and products intended to prevent contamination by wrapping or sealing objects/samples; products may be available in various materials such as parafilm, aluminum, plastic, etc.

Filter tips

Filter Tips are the face of pipetting technology. Filtered pipette tips are also referred to as aerosol barrier tips as they are fitted with a filter inside the proximal part of the pipette tip, protecting the pipette from aerosols and aspirating viscous or volatile samples into the shaft.

Durham tubes

Durham tubes are used in microbiology to detect production of gas by microorganisms. They are simply smaller test tubes inserted upside down in another test tube. This small tube is initially filled with the solution in which the microorganism is to be grown.

Haemocytometer (Counting Chamber slide)

The **hemocytometer** (or **haemocytometer** or **counting chamber**) is a specimen **slide** which is used to determine the concentration of cells in a liquid sample. It is frequently used to determine the concentration of blood cells (hence the name “hemo-“) but also the concentration of sperm cells in a sample.

Fridge

Laboratory refrigerators are used to cool samples or specimens for preservation. They include refrigeration units for storing blood plasma and other blood products, as well as vaccines and other medical or pharmaceutical supplies.

Centrifuge tube

Centrifuge tubes are used to contain liquids during **centrifugation**, which separates the sample into its components by rapidly rotating it around a fixed axis. Most **centrifuge tubes**have conical bottoms, which help collect any solid or heavier parts of the sample being centrifuged.

Hista flex

Hista-Flex™ EXCEL is resistant to section wrinkles and wax block softening during tissue sectioning. Suitable for general embedding and sectioning and ideal for use with sliding microtomes.

Scissors

Scissors are cutting tools with two blades joined in the center such that the sharp edges of the blades slip into each other. WPI has a wide range of scissors, ranging from traditional ring scissors to spring scissors. When choosing a fine pair of surgical scissors or micro scissors, WPI offers many choices.

Parafilm

Parafilm M is commonly used in health care, pharmaceutical and research laboratories for covering or sealing vessels such as flasks, cuvettes, test tubes, beakers, petri dishes and more.

Blood lancets

A **blood lancet**, or simply **lancet**, is a small medical implement used for capillary **blood** sampling. **Lancets** are used to make punctures, such as a fingerstick, to obtain small **blood**specimens.

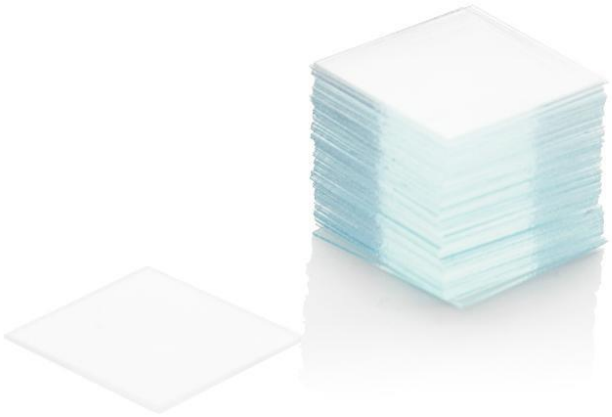
Digital thermometer

Digital Thermometers are easy-to-use, accurate, and durable for a variety of applications including air or fluid readings, surface temperatures, high- temperature.

Safety goggles

Goggles, or safety glasses, are forms of protective eyewear that usually enclose or protect the area surrounding the eye in order to prevent particulates, water or chemicals from striking the eyes. They are used in chemistry laboratories and in woodworking.

Cover slip



A prepared slide that is made up of a microscope slide, specimen and a cover slip not only gives the viewer better control over the specimen, but protects the microscope as well. The cover slip protects the ocular lens from damage by acting as a barrier between it and the specimen.

Sterile surgical blade

Disposable **scalpel blades** are razor sharp, come in a variety of shapes and have many uses, like **surgery** and gross dissection. These scalpels are comprised of a reusable handle and disposable **scalpel blades**, usually sold separately. **Scalpel blades** are **sterile**, individually packaged **blades** designed for single use.

Microhematocrit tube

Thin capillary tubes of various material compositions used for collecting blood samples via capillary action and measuring the volume percentage of red blood cells in those samples; tubes may be heparinized to prevent blood clotting.

Accu Tube

The Accutube averaging Pitot tube is a head type device, which generates a differential pressure signal similar to the orifice, venturi, flow nozzle, and other head producing primary elements. ... It has been proven that the Accutube's flow measurement accuracy is better than that of the orifice.

Disposable syringe

A **disposable syringe** consists of a plastic barrel with a needle of varying size attached. The needle comes with a cover to help prevent unintentional pokes and is great for quick care and for keeping things sterile.

Plastic pipettes

A pipette is a laboratory instrument used to measure out or transfer small quantities of liquid, in volumes of milliliters (mL), microliters (µL). It is used in a wide variety of experiment processes in chemistry, molecular biology (biotechnology), medical science, experiments in the field of natural science in general, analysis of food and chemicals, food safety inspections and inspections in clinical examinations.

First aid box

First aid box should be a dedicated cabinet or box and should contain essential medicines, antiseptic lotions, creams, bandages and sterilised cotton. A person should be made responsible for maintaining a list of the contents and discarding the expired medicines and replacement with fresh stocks.

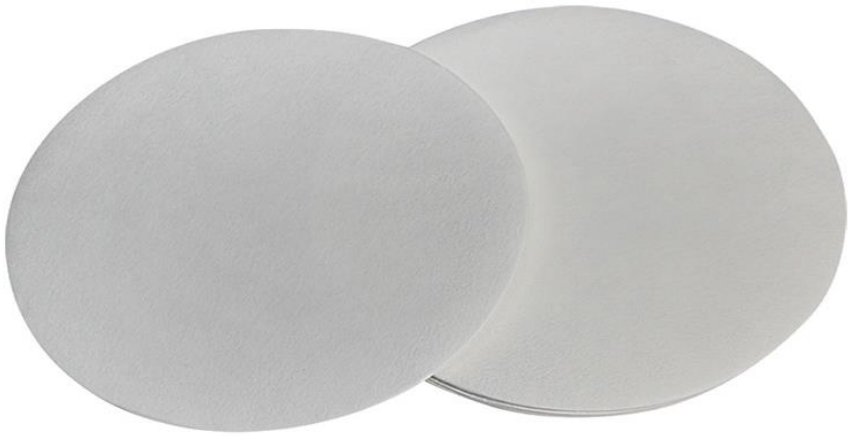
Burette stand

Burette clamp is a scientific equipment which used specifically to hold and secure a burette on a stand, so that a burette is fixed and more convenient for the experiment.[1] Burette clamps can be made with many materials such as plastic and cast iron. However, an iron clamp with a rubber knob to hold the burette are usually more durable. Usually burette clamps come in doubles, which means they can hold two burettes.

Insect collecting net

This net is used for **Insect collecting** refers to the collection of insects and other arthropods for scientific study or as a hobby.

Qualitative filter paper

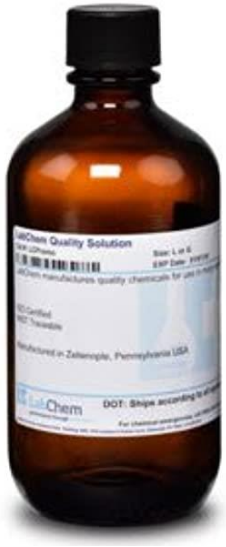


Qualitative filter papers are what most users would consider general purpose filter papers. There are a vast range of applications in and out of the laboratory. Composed of cellulose fiber, these filters are manufactured from high-quality cotton linters treated to maximize alpha cellulose.

Agar

(Potato dextrose agar, Nuterient agar, Peptone water, Blood agar base, Mueller hinton agar, Malt extract agar, Brain heart infusion agar and Agar bacteriological) Agar is commonly used in the laboratory to help feed and grow bacteria and other microorganisms. It acts as a culture that provides nutrients and a place for these items to grow, but since it is indigestible to the microorganisms, they cannot eat and destroy it.

Phenol



Phenol, also known as carbolic acid, is an aromatic organic compound. ... In research laboratories phenol, when suspended in chloroform, is commonly used in the extraction of DNA from biological samples. The liquid-liquid extraction of aqueous samples are mixed with equal volumes of a phenol:chloroform solution.

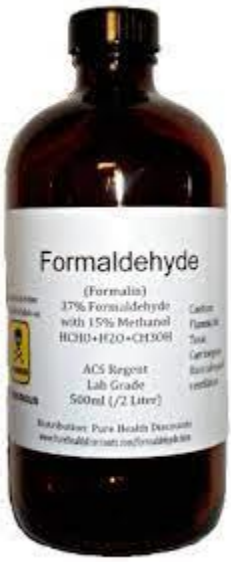
Hydrochloric acid

Hydrochloric acid is a strong acid and a highly corrosive liquid. This chemical compound is the aqueous (water-based) solution of hydrogen chloride gas. ... A 6N solution is considered toxic and causes severe skin burns and serious eye damage. A 1N solution may corrode metal but is not toxic.

Chloroform

Chloroform, or **trichloromethane**, is an organic compound with formula $CHCl_3$. It is a colorless, strong-smelling, dense liquid that is produced on a large scale as a precursor to PTFE. It is also a precursor to various refrigerants.[8] It is one of the four chloromethanes and a trihalomethane. It is a powerful anesthetic, euphoriant, anxiolytic and sedative when inhaled or ingested.

Formaldehyde



Formaldehyde is a colorless, strong-smelling gas. Commonly known as preservative in medical laboratories and mortuaries, formaldehyde is also found in other products such as chemicals, particle board, household products, glues, permanent press fabrics, paper product coatings, fiberboard, and plywood.

Glacical acetic acid

Spectrum Chemical has exactly the form and grade of Glacial Acetic Acid for your labneeds. ... Glacial Acetic Acid is an organic compound that is also called ethanoic acid. It is a liquid without color and a particular sour taste and strong smell.

Lactic acid

Lactic acid is an organic acid. It has a molecular formula CH3CH(OH)COOH. It is white in the solid state and it is miscible with water. When in the dissolved state, it forms a colorless solution. Production includes both **artificial** synthesis as well as natural sources

Glycerol

Glycerol is an alcohol often used in the lab to avoid freezing and increase the density of liquids. Its standardised IUPAC name is propane-1,2,3-triol. It is also often referred to as glycerine or glycerin

pH buffer

A buffer is a solution that can resist pH change upon the addition of an acidic or basic components. It is able to neutralize small amounts of added acid or base, thus maintaining the pH of the solution relatively stable. This is important for processes and/or reactions which require specific and stable pH ranges.

Lactophenol blue

Lactophenol cotton blue (LCB) is a mixture of methyl blue, a histological stain, and lactophenol It is used in wet-mount preparations for visualization of fungal.

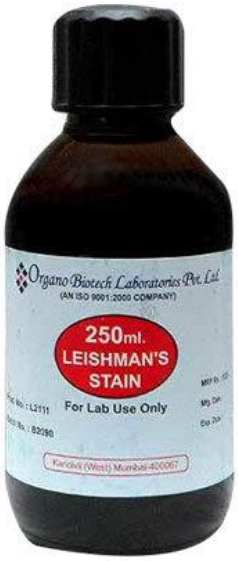
Gram stain kit

It quickly and cost effectively divides bacteria into one of two types: Gram positive or Gram negative. Once differentiated, further relevant tests help determine the precise bacteria.

Genomic DNA extraction

Genomic DNA Extraction Kit designed for rapid isolation of pure genomic DNA from blood leukocytes or cultured mammalian cells in a small amount. The extracted DNA can be used for any molecular biology procedures such as PCR, restriction digestion, cloning and sequencing, etc.

Leishman stain



Leishman stain, also known as Leishman's stain, is used in microscopy for staining blood smears. It is generally used to differentiate between and identify white blood cells, malaria parasites, and trypanosomas. It is based on a methanolic mixture of "polychromed" methylene blue (i.e. demethylated into various azures) and eosin.

Immersion oil for microscopy

In light microscopy, oil immersion is a technique used to increase the resolving power of a microscope. This is achieved by immersing both the objective lens and the specimen in a transparent oil of high refractive index, thereby increasing the numerical aperture of the objective lens.

Anti mono clonal

The reagents will cause direct agglutination (clumping) of test red cells that carry the corresponding ABO antigen. Lorne Monoclonal IgM ABO blood grouping reagents contain murine monoclonal antibodies diluted in a phosphate buffer containing sodium chloride, EDTA and bovine albumin.

Antibiotic disc

The disk diffusion test is a culture-based microbiology assay used in diagnostic and drug discovery laboratories. In diagnostic labs, the assay is used to determine the susceptibility of bacteria isolated from a patient's infection to clinically approved antibiotics