

LIST OF EQUIPMENT IN ACEMFS LABORATORIES AND THEIR APPLICATIONS



Name: Thermo Scientific iCAP PRO Series Inductively Coupled Plasma-Optical Emission Spectrometry (ICP OES) Systems (Thermo Fisher Scientific)

Specifications

- **Voltage:** 200-240V, 50/60 Hz
- **Software:** Intuitive operation, step-by-step method creation, comprehensive QC features
- **Features:** Enhanced sample throughput, matrix tolerance, and flexibility
- **Frequency:** 50/60 Hz

Applications

- **Food and beverage analysis:** Determining the elemental/mycotoxin composition of food products and beverages for quality control and safety.
- **Environmental analysis:** Measuring trace elements/mycotoxins in water, air, and soil samples
- **Industrial analysis:** Measuring elemental composition in industrial materials such as polymers, ceramics, and metals.
- **Geochemical analysis:** Elemental composition analysis of rocks and minerals for geological studies

- **Pharmaceutical analysis:** Analysis of the elemental composition of drugs and raw materials for quality control and safety.



Name: Digital Trinocular Microscope with built-in-LCD Screen AmScope brand (XSZ-107BN model)

Specifications

- **Magnification:** 40X – 1600X
- **Stage:** Double layer mechanical stage 140x140 mm, moving range 75x45 mm
- **Viewing head:** Sliding binocular head inclined at 45°
- **Focusing:** Coaxial coarse and fine adjustment, focusing range 30 mm, focusing interval 0.002 mm.
- **Objectives:** Acromatic 4X, 10X, 40X(S), 100X (S, Oil).
- **Eyepieces:** Wide field eyepiece WF10X, WF16X
- **Camera:** Digital camera for capturing images
- **LCD screen:** Built-in for live viewing and image/video playback

Applications

- **Laboratory Research:** Microbiology, cell biology, and genetics

- **Education:** teaching demonstrations and student use in chemistry, biology, and **other scientific disciplines.**
- **Industrial use:** for quality control and inspection tasks in electronics, manufacturing and materials science.
- **Medical Diagnostics:** for clinical examinations and pathology analysis
- **Forensic Science:** for analyzing evidence including fingerprints, hair and fibers.



Name: Thermo Scientific Dionex UltiMate 3000 HPLC System with DAD-3000RS Diode Array Detector

Specifications

- **Type:** High-performance liquid chromatography (HPLC) system
- **Model:** UltiMate 3000
- **Components:**
 - Autosampler
 - Pump(s)
 - Diode array detector (DAD)
 - Thermostatted column compartment
- **Pressure range:** 1000 bar
- **Flow rate range:** 0.001 to 10 mL/min

Applications

- Clinical research
- Drug discovery
- Food quality control
- Biomarker identification
- Life science research
- Pharmaceutical development
- Environmental testing



Name: Autoclave Sterilizer, Class N Autoclave, STV-I Series – Bioevopeak

Temperature range: 105°C to 134°C (221°F to 280°F)

Pressure range: 0.22 MPa (32 psi)

Applications

- Sterilization



Name: BIOBASE Vertical Freeze Dryer

Specifications

- **Model:** FDL2-10N-2-60D
- **Type:** Vertical, air-cooled
- **Vacuum Degree:** $\leq 5\text{Pa}$
- **Defrosting function:** Yes
- **Cold trap Temperature:** -56°C or -80°C (optional)

Applications

- Solvent removal from samples
- Purification of compounds
- Crystallization
- Drying of samples
- Botanical extraction
- Decarboxylation



Name: MilliporeSigma Direct-Q Direct-Q UV Water Purification System

Specifications

- **Water Type:** Produces Type 1 ultrapure water
- **Resistivity:** 18.2 M Ω .cm at 25°C
- **UV Lamp:** Built-in 185 nm and 254 nm UV lamp for low TOC water
- **Total Organic Carbon (TOC):** \leq 5 ppb
- **Applications:** Suitable for organic-sensitive applications
- **Bacterial retention:** Greater than 99%
- **Contaminant rejection:** 99%

Applications

- **General laboratory use:** Preparation of reagents, culture media, and buffers
- **Analytical techniques:** GC, ICP-MS, HPLC, and other analytical instruments
- **Clinical application:** Clinical chemistry and hematology analyzers
- **Life science applications:** Molecular biology, cell culture, and protein purification.



Name: Rotary evaporator (Bioevopeak)

Specifications

- Model: Rev 2000A
- Voltage: 230V/50Hz

Applications

- Solvent removal from mixtures
- Concentration of solutions by evaporation
- Purification of compounds from mixtures
- Drying of samples by removing residual solvents
- Separation of compounds based on their boiling points
- Chemical synthesis
- Natural product extraction such as essential oils, and other valuable components from plants
- Cannabis and hemp extraction



Name: Heating Mantle

Specifications

- **Model:** 250ml*6
- **Power:** 1080W
- **Voltage:** 220V

Applications

- Heat or temper liquids in reaction vessels for
 - Distillation
 - Boiling
 - Extraction
 - Evaporation



Name: Fisherbrand Vortex Mixer Wizard IR model

Specifications

- **Speed:** Variable, up to 3000 rpm
- **Operation Modes:** Touch and Infrared Sensor
- **Accessories:** Compatible with a variety of tubes, plates, and flasks

Applications

- **Mixing liquids:** in tubes, vials, or flasks
- **Sample preparation:** Mixing reagents, preparing blood samples, and DNA extraction
- **Resuspending particles:** Resuspends pellets, cells in a liquid, or precipitates



Name: Electronic scale (M-METLAR)

Specifications

- **Capacity:** 300G
 - **Division:** 0.01G
- AC/DC Power supply

Applications

- **Laboratory:** Weighing media, chemicals, samples and other materials with precision
- **Industrial:** Measuring ingredients in food production, quality control.
- **Jewelry:** Weighing gemstones and precious metals



Name: UltraSonic Cleaner (Greatsonic)

Specifications

- **Model:** GS-DS240
- **Voltage:** AC220-240v 50Hz
- **Frequency:** 40kHz
- **Ultrasonic power:** 120W
- **Heating power:** 100W

Applications

- **Laboratory cleaning:** Glassware, pipettes, and other laboratory equipment
- **Medical and dental instruments:** Cleans surgical instruments, dental tools, and other medical equipment



Name: Bioevopeak heating mantle

Specifications

- **Capacity:** 50 – 20,000 ml
- **Heating mode:** Surface heat-conduction
- **Maximum surface temperature:** 450°C
- **Temperature control range:** Room temperature + 20°C to 250°C

Applications

- Heating or tempering organic liquids in round-bottom flasks
- Boiling, evaporation, distillation, and extraction processes
- Reaction kettles and relevant reaction vessels



Name: Kjeldahl Digestion Furnace

Specifications

- **Model:** KDN-08C
- **Temperature range:** Typically, up to 450oC
- **Digestion tube size:** 300 ml or 500 ml
- **Number of samples:** typically, 6-20 samples

Applications

- **Food and beverage analysis:** Protein content determination in meat, dairy, grains, etc.
- **Environmental analysis:** Nitrogen analysis in soil, wastewater, and fertilizers
- **Agricultural analysis:** Protein content in feed and forage
- **Chemical analysis:** Nitrogen determination in various chemical compounds
- **Pharmaceutical analysis:** Nitrogen content in drugs and active ingredients.



Name: Thermostat oven ET-9100A

Specifications

- Model: ET-9100A
- Manufacturer: E-Track Instruments
- Capacity: 50 litres
- Temperature range: Ambient to 250oC
- Temperature control: Digital thermostat with accuracy of +/-1°C

Applications

- **Sterilization:** Eliminating microorganisms from laboratory glassware and equipment
- **Drying:** Removing moisture from samples such as soil testing or material analysis
- **Annealing:** Heat treating metals and glass to improve their properties
- **Testing:** Simulating environmental conditions for product testing and quality control



Name: Thermo Scientific ISQ 7610 Gas Chromatography Mass Spectrometry (GC-MS) System, coupled with a TRACE 1610 Gas Chromatograph

Specifications

- **Mass Spectrometer:** ISQ 7160
- **Gas Chromatograph:** TRACE 1610
- **Mass Range:** 1.2 – 1100 u
- **Scan Speed:** 20,000 u/sec
- **Sensitivity:** High sensitivity for trace analysis
- **Ion Source:** Electron ionization (EI) and optional Chemical Ionization (CI)
- **Software:** Thermo Scientific Chromeleon Chromatography Data System (CDS)
- **Detector:** Electron Multiplier

Applications

- **Food Safety:** Analysis of food products for contaminants, adulterants, and pesticide residues
- **Forensic Science:** Drug testing, analysis of arson residues, identification of unknown substances
- **Environmental Analysis:** Detection of pollutants, pesticides, and other contaminants in soil, water, and air
- **Clinical Chemistry:** Analysis of biomarkers and metabolites in biological samples

- **Pharmaceutical Analysis:** Quality control testing, impurity profiling, and drug discovery.
- **Petrochemical Industry:** Analysis of crude oil, fuels, and other petroleum products.



Name: Genesys 150 UV-Vis Spectrometer

Specifications

- **Wavelength:** 190 – 1100 nm
- **Bandwidth:** 1.8 nm
- **Detector:** Silicon photodiode
- **Light source:** Xenon flash lamp (long life, no warm-up time)
- **Display:** Color touchscreen
- **Data output:** USB, Ethernet
- **Software:** Local control, optional PC software

Applications

- **Quantitative Analysis:** Measure the concentration of known substances in a solution by measuring the absorbance at specific wavelength
- **Qualitative Analysis:** Identify unknown substances by their characteristic absorption spectra
- **Chemical Kinetics:** Monitor the progress of chemical reactions by measuring the change in absorbance over time.

- **Protein/DNA Analysis:** Determine the concentration and purity of DNA and protein samples.
- **Pharmaceutical Analysis:** Quantify drug compounds and analyze their purity.
- **Environmental Monitoring:** Analyze soil and water samples for pollutants
- **Food and Beverage Analysis:** Measure the concentration of various components in food and beverages, e.g. vitamins, sugar, and caffeine.



Name: Digital Rotator

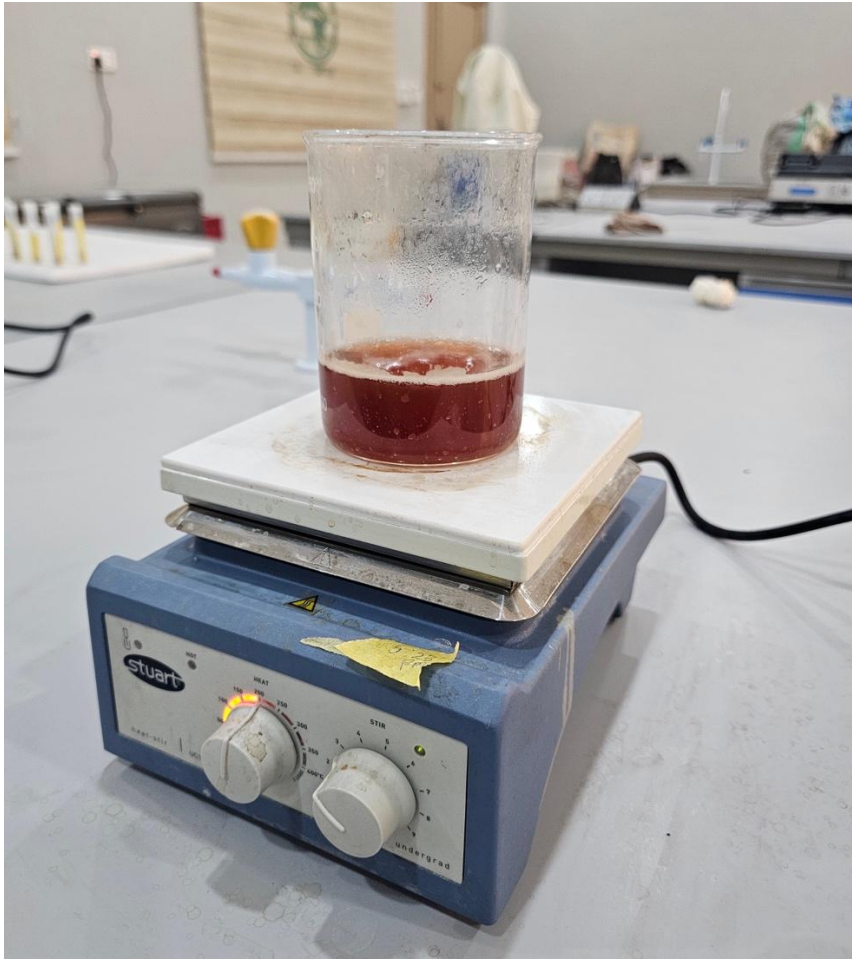
Specifications

- **Model:** DOR-2828D
- **Volts:** 100-240 Hz
- **AMPS:** 0.5 W
- **R.P.M:** 250

Applications

- **Mixing blood samples:** Prevents coagulation and ensures homogeneity
- **Aerating cultures:** Provides oxygen for cell growth
- **Hybridization:** Promotes binding of molecules in assays
- **Staining and washing:** Even distribution of reagents
- **Suspending biological samples:** Keeps cells and particles evenly distributed
- **VDR and RPR tests:** Used in syphilis serology

- **EIA tests:** Enzyme immunoassays for various analytes



Name: Stuart UC152 hotplate stirrer

Specifications

- **Plate Size:** 150 X 150 mm
- **Top Plate Material:** Ceramic glass
- **Temperature Range:** Ambient to 450°C
- **Stirring Speed:** 100 to 2000 rpm
- **Maximum Stirring Capacity:** 15 liters
- **Dimensions:** 172 x 248 x 122 mm
- **Weight:** 2.9 kg

Applications

- **Biology:** Culture media preparation, incubating samples, cell culture, mixing microbial cultures.
- **Chemistry:** Dissolving solids, accelerating reactions, mixing reagents

- **Physics:** heating and stirring liquids for experiments



Name: CENHBR-1 L Benchtop High-speed Refrigerated Centrifuge (MRC LTD)

Specifications

Max speed: 18500r/min

Voltage: 220V 50HZ

Max RCF: 29990Xg

Applications

- Cell biology: Separating cells, organelles, and subcellular components
- Molecular biology: DNA and RNA isolation, PCR analysis, protein purification
- Microbiology: bacterial and viral isolation.
- Clinical diagnostics: Serum separation, blood component isolation
- Nanotechnology: Nanoparticle separation and purification



Name: Drying oven DON-18E (Bioevopeak)

Specifications

- **Voltage:** 230/50Hz
- **Model:** DON-18E

Applications

- **Drying:** Removing moisture from samples, such as powders, glassware, and other laboratory materials.
- **Sterilizing:** Sterilizing equipment and glassware.
- **Annealing:** Heat-treating materials to modify their properties
- **Heating:** Heating samples to a specific temperature for various experiments or processes.
- **Curing:** Curing materials such as epoxy resins or polymers



Name: Applied Biosystems SimpliAmp Thermal Cycler

Specifications

- **Capacity:** 96-well (0.2 mL)
- **Temperature:** 4°C to 99°C
- **User Interface:** 8-inch color touchscreen
- **Ramp Rate:** Up to 3.0°C/sec

Applications

- **Gene expression analysis:** Studying the expression levels of genes in different samples
- **DNA sequencing:** Determining the order of nucleotides in a DNA molecule.
- **Cloning:** Generating multiple copies of a specific DNA fragment
- **DNA Amplification:** Perform PCR, which amplifies specific DNA sequences for various downstream applications
- **Genotyping:** Identifying genetic variations between individuals
- **Disease diagnostics:** Detecting the presence of pathogenic organisms or genetic mutations



Name: Thermo Fisher Applied Biosystems QuantStudio 5 Real-Time PCR System

General Specifications

- **Sample capacity:** 96-well or 384-well formats available
- **Temperature range:** 4-99.9°C
- **Reaction volume:** 10 to 100 µL
- **Maximum block ramp rate:** 6.5°C/sec (96-well)
- **Average sample ramp rate:** 3.66°C/sec (96-well)
- **Excitation source:** Bright white LED
- **Excitation/detection range:** 450-680 nm and 500-730 nm
- **Connectivity:** Stand-alone, PC-connected, or cloud-based via LAN or Wi-Fi

Applications

- Pathogen detection
- Gene expression analysis
- SNP genotyping
- Absolute and relative quantification

- High-resolution melt



Name: Benchmark BeadBug 6-position Homogenizer

Specifications

- **Model:** HOG-O6
- **Speed:** 4.0 m/s – 7.0 m/s (in 0.05 m/s increments)
- **Timer:** 1 sec – 90 sec
- **Grinding Formats:** 6 x 6 ml tubes, 2 x 5 ml tubes
- **Dimensions:** 8.6 x 14 x 8 inches

Applications

- **Molecular biology:** DNA, RNA, and protein extraction from tissues and cells
- **Microbiology:** Cell disruption for yeast, bacteria, and fungi
- **Environmental science:** Soil and sediment analysis
- **Food science:** Food sample preparation for analysis

- **Pharmaceutical research:** Drug discovery and development



Name: Benchmark Scientific PlateFuge Microcentrifuge

Specification

- **Speed:** 2,550 rpm/600 xg
- **Capacity:** 2 PCR plates, 2 microtiter plates (up to 25 mm)
- **Deceleration:** 4 seconds
- **Dimensions:** 9.2 x 10.2 x 7.75 in
- **Weight:** 9 lbs

Applications

- PCR plate spin-down
- Microplate applications



Name: Balance (E-METLAR)

Applications

- Preparation of samples
- Formulation
- Differential weighing
- Density determination
- Pipette calibration
- Quality control

- Model: FA2204B
- Voltage: 220V/50Hz



Name: Thermostat incubator with shaker

Specifications

- Model: IN-SK30
- Capacity: 30 liters
- Temperature: Ambient + 5°C to 60°C
- Shaking speed: Adjustable

Applications

- **Microbiology:** Growing and maintaining microbial cultures
- **Cell culture:** Incubating cells for research and diagnostics
- **Biochemical reactions:** Providing controlled environment for enzyme assays
- **Hybridization:** incubating samples for nucleic acid hybridization experiments
- **Food and beverage testing:** analyzing food and beverage samples for microbial contamination
- **Pharmaceutical testing:** Testing the stability and efficacy of pharmaceuticals



Name: Biogold Biosafety Cabinet BSC-70011A2

Specifications

- **Class:** Class II, Type A2
- **Model:** BSC-70011A2
- **Airflow:** 70% recirculated, 30% exhausted
- **Inflow velocity:** 75 feet per minute
- **Features:** LCD display, UV lamp for decontamination

Applications

- **Molecular biology:** Performing DNA and RNA work
- **Cell culture:** Maintaining sterile conditions for cell growth and manipulation
- **Microbiology:** Working with non-volatile infectious agents
- **Genetics:** Handling genetic material
- **Research:** Various research applications requiring protection from biohazards

