

Department of Biotechnology

NIPER-Raebareli

CLASSROOMS

NIPER-Raebareli firmly believes in the practice of latest technological tools to enhance the whole process of teaching. It is a massive paradigm shift from the conventional method of "Monolog type Teacher-centric class room lecture" to "Interactive Sessions, Board capture, Document storage, and sharing". These smart class rooms aid the students to gain a better understanding of the subject and also give a boost by providing means to visualize the concept being put forward by the faculties. Hence, the Biotechnology classroom is well-equipped with LCD Touch screen Interactive Panel, projectors, and computers. The classrooms have ergonomically designed furniture, seamless Wi-Fi connectivity, air-conditioner, aesthetic lighting and interiors that make the environment of the classroom more encouraging towards learning.



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List of Instruments

Cooling Centrifuge (Thermo Scientific)
Sceptor Cell Counter (Merck Millipore)
Laminar Air Flow (ESAW)
Bacteriological Incubator (ESAW)
Water bath (ESAW)
95 L Hot air oven (ESAW)
UV Transilluminator (Thermo Fisher)
Hot air oven (ESAW)
Digital Balance (Mettler Toledo)
Gel Electrophoresis, vertical and Horizontal with blotting assembly (Bio-Rad)
Vortex Shaker (Tarsons)
Frost Free Refrigerator
Autoclave (Equitron)
1-8 °C refrigerator (Celfrost)
pH meter (ESAW)
-16 to -25 °C Refrigerator (Celfrost/Vestfrost)
Quant Studio RT-PCR Machine (Thermo Fisher Scientific)
Basic Power Supply (Bio Rad)
Mini Rotary Shakers (Remi)

Instruments in Department of Biotechnology, NIPER (R)

Cooling Centrifuge (Thermo Scientific)



Refrigerated laboratory centrifuges range from -20°C – 40°C , and are used in quantification analysis of DNA, RNA, antibody and PCR. These centrifuges can attain a rotational speed of over 30,000 rpm, and a relative centrifugal force (RCF) of over 65,000 x g. These systems utilize with capacities reaching 4 x 500 ml utilize centrifuge tips and tubes or well-plates for use in a number of applications.

Scepter Cell Counter (Merck Millipore)



The Scepter Cell Counter is used to perform a fast and convenient cell counts in an easy to use format. This instrument is used in sampling process where it reveals data on cell concentration, average diameter, average volume and histogram displaying population information on your culture within 30-40 seconds. The time to perform the cell counting experiment has been reduced from approx. 10-15 minutes in conventional cell counting systems to less than 30 seconds by the

use of Scepter Cell Counter. This device stores up to 72 counts experiments which can be directly downloaded and uploaded to Excel for further investigation and analysis.

Laminar Air Flow (ESAW)

Laminar air flow is an enclosed bench with in-flow laminar air drawn through one or more HEPA filters, designed to create a particle-free working environment and provide product protection. It is used to prevent contamination of biological samples and any particle sensitive materials. This instrument comes with an inbuilt UV-C germicidal lamp that is kept on for 20 minutes to sterilize the interior and contents before usage to prevent contamination of the experiment that must be switched off when the cabinet is being used, to limit exposure to skin and eyes as stray ultraviolet light emissions can cause cancer and cataracts.



Bacteriological Incubator (ESAW)

Bacteriological incubators are highly effective testing machines that are widely used in laboratories and other areas to maintain and develop artificial ecological conditions such as oxygen generation, carbon dioxide content, temperature and humidity conditions required for microbial and molecular biological, experiments related to culture of eukaryotic cells and bacterial cells. The equipment is also used to create sufficient amount of temperature and humidity conditions in the laboratories.



Water bath (ESAW)



A water bath is a cabinet utilized in biological labs to incubate sensitive samples which cannot be kept in direct dry heat. It is used to manage the effect of testing parameters like the temperature, time etc. on the experimental samples. Other than incubation the chambers can also be used for heating up reagents or chemical, to melt the substrates, incubate the cultures of plant cells and to conduct high rated chemical reactivity which requires rising temperature but not dry heat or direct ignition.

Hot air oven (ESAW)

A hot air oven is an instrument used for dry heat sterilization of materials that cannot be used wet that does not melt, catch fire, or change form when exposed to high temperatures. Items that are sterilized in a hot air oven include: glassware (like petri dishes, flasks, pipettes, and test tubes), chemical Powders (like starch, zinc oxide, and sulfadiazine), materials that contain oils, metal equipment (like scalpels, scissors, and blades).



UV Transilluminator (Thermo Fisher)

Ultra-violet (UV) transilluminator is a standard piece of equipment used in life science laboratories for visualization of target DNAs and proteins. The key application for a UV transilluminator is for visualization of DNA and protein agarose and polyacrylamide gels after electrophoresis.



Digital Balance (Mettler Toledo)

Digital weighing balance is an instrument that is used to determine the weight of an object with high precision. It is an advanced technology for weighing test materials, sampling amounts, formulation, density determination, purity analysis and quality control testing. Digital readings cut out the guesswork and keep you honest about your weight.



Gel Electrophoresis, vertical and Horizontal with blotting assembly (Bio-Rad)

2D gel electrophoresis is used in proteomics for effective separation of protein molecule while maintain both the quantitative and qualitative aspect of the protein. This technique uses two different electrophoresis separation, isoelectric (IEF) and SDS-PAGE to separate proteins based on their isoelectric points and molecular weight. The protein bands obtained as a result of the 2D electrophoresis can be transferred to the membranes using the attached blotting assembly.



Vortex Shaker (Tarsons)

Vortex mixers are one of the primary technologies for mixing laboratory samples in test tubes, well plates, or flasks by agitating the samples for reactions and homogenization with high degrees of precision.



Frost Free Refrigerator



Frost-free fridge offers an even distribution of cool air within the refrigerator by means of electric fans. Since this technology prevents the formation of ice, no defrosting is necessary. It is used to maintain the temperature required for storing samples, chemicals, media, formulations prepared and utilized in the research experiments.

Autoclave (Equitron)



Autoclaves provide a physical method for disinfection and sterilization with a combination of high temperature, steam, pressure and time in order to kill infectious microorganisms and spores. They are also used to decontaminate certain biological waste and sterilize media, instruments, lab ware, medical waste that might contain bacteria, viruses and other biological materials that are recommended to be inactivated by autoclaving before disposal.

1-8 °C refrigerator (Celfrost)



These refrigerators are used to maintain a cold storage conditions for samples, chemicals specified to be stored at 1-8 °C.

pH meter (ESAW)



A **pH meter** is an instrument used to measure acidity or alkalinity of a solution, soil, waste water, chemical and pharmaceuticals, food products, edibles, experimental solutions etc. pH is measured based on the degree of the hydrogen ion $[H^+]$ and the hydroxyl ion $[OH^-]$ concentrations in any given sample. pH is an important quantity that reflects the chemical conditions of a solution. pH can control the availability of nutrients, biological functions, microbial activity, and the behavior of chemicals.

-16 to -25 °C Refrigerator (Celfrost/Vestfrost)



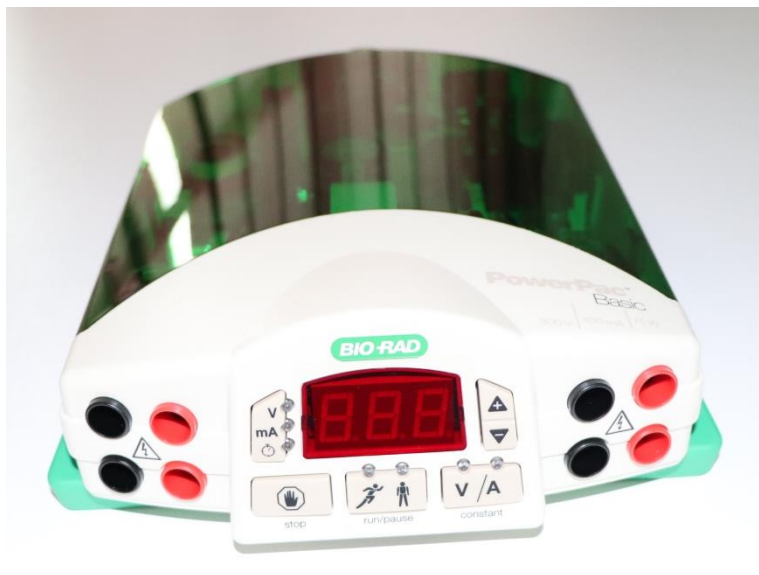
In laboratory and clinical environments, it is important to keep perishable samples at a consistent temperature well below freezing. -16°C to -25°C temperature is considered the optimum at which we store perishable, flammable, or hazardous material, -20°C being the most commonly accepted baseline. Operation voltages range from 115 to 230 V, depending on temperature range and sample capacity. -16°C to -25°C laboratory deep freezers play important role in safe storage of reagents, frozen vaccines and other temperature sensitive specimens for research purposes that require freezing temperature up to -20 degree. These freezers are ideal for routine storage of samples in the clinical, pharmaceutical and biomedical laboratories.

Quant Studio RT-PCR Machine (Thermo Fisher Scientific)

The system supports a broad range of genomic applications, such as analyses of gene expression, microRNAs and noncoding RNAs, copy number variation, drug metabolism enzymes, and protein expression; SNP genotyping; and mutation detection. The inbuilt and optimized Design and Analysis software is ideal for both first-time and experienced users.

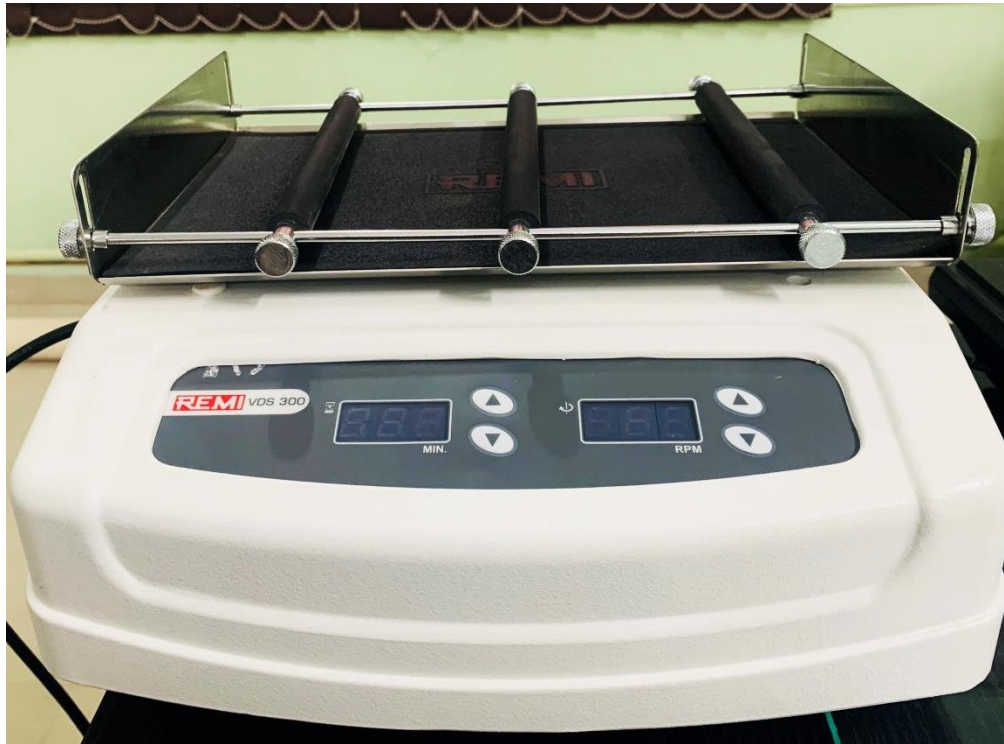


Basic Power Supply (Bio Rad)



The PowerPac™ Basic power supply is recommended for basic applications such as submerged horizontal and mini vertical gel electrophoresis.

Mini Rotary Shakers (Remi)



Mini rotator shakers are used for gentle mixing of samples, solvents, reaction mixtures, formulations and test preparations in test tubes, ELISA plates, mixing plates & glass vessels of different capacities. These shakers are used in pathology, microbiology, chemistry, molecular biology & biotechnology to develop a uniform mixture of solutions, reactants. Speed Range 80-180 RPM with 0-15 minutes timer.