



# NIMR

## AT A GLANCE

NIGERIAN INSTITUTE OF MEDICAL RESEARCH



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NIMR... the Foremost Research Institute in Nigeria

## NIGERIAN INSTITUTE OF MEDICAL RESEARCH

📍 6, Edmund Crescent (off Murtala Mohammed Way),  
P.M.B. 2013, Yaba, Lagos. Nigeria.

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## BRANCH OFFICES

### **Abuja**

Nigerian Institute of Medical Research,  
Terrace Duplex  
Block 5, Flat 1, Bida Street, Area 2, Garki, Abuja  
0803 612 2972 & 070 640 65147

### **Maiduguri**

Gamboru/Ngalla Road,  
Gate II, Lake Chad Research Institute Compound,  
P.M.B 1293, Maiduguri - Borno State  
0803 972 2165 & 0708 037 2369

### **Kainji**

c/o Nigerian Freshwater Fisheries Research Institute  
P.M.B 6006, New Bussa, Niger State  
0703 086 873 & 0805 795 8957

### **Asaba**

Plot 13, Block 111  
Phase IV, Core Area, Asaba  
Delta State



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## WHO WE ARE

- \* The nation's foremost Institute of Medical Research
- \* We carry out medical research in Nigeria to improve public health and national development
- \* We collaborate with several institutions nationally and internationally to facilitate enabling environment for medical research
- \* We attract some of the brightest and best brains nationally and internationally in research collaboration
- \* Research Collaboration/Ajdunct positions in National and International Universities
- \* We disseminate health research findings for policy practices and programme

## VISION

To be an institution of excellence in basic, applied and operational research for the promotion of National Health and Development in Nigeria.

## CORE VALUES

Honesty, Integrity  
Leadership  
Excellence  
Respect, Fairness,  
Dignity, Teamwork,  
Innovation, Relevance  
Hardwork  
Fair Reward  
Recognition  
Accountability  
Transparency  
Communication:  
Internal & External  
Equity

## MISSION

To conduct research into diseases of public health importance in Nigeria and develop structures for the dissemination of research findings while providing the enabling environment and facilities for health research and training in cooperation with the federal and state ministries of health and in collaboration with universities, allied institutions and organized private sector nationally and internationally



**Prof Babatunde Lawal Salako**  
Director General/CEO,  
Nigerian Institute of Medical Research

# Biochemistry & Nutrition Department

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Department of Biochemistry and Nutrition is a multidisciplinary entity that seeks to use cutting edge technologies and sound expertise in basic and translational research in providing impactful outputs via its units:

## **Biochemistry & Immunogenomics Unit:**

focuses on biochemical analysis of biological molecules, polymorphisms in red blood cell related diseases, molecular mechanisms of malaria parasite infectivity and pathogenesis.

## **Centre for Research in Traditional, Complementary and Alternative Medicine (CRTCAM):**

trains and conducts research into safety and authenticate efficacy claims and compound testing on selected natural products and active ingredients.

## **Nutrition Unit:**

conducts investigation in nutritional quality, safety, and associated disorders such as deficiencies of vitamins, minerals, and in-born errors of metabolism.

## **Immunology Unit:**

focuses on the cellular immune responses in some tropical diseases in humans and animals such as performance of malaria antigen detection vs. parasite enumeration by microscopy.

## **Malaria Research & Epidemiology Unit:**

monitors the prevalence of malaria in communities via the use of molecular diagnosis, therapeutic efficacy, resistance detection of re-infected and recrudescence in Nigeria.

## **Molecular Oncology & Diagnostics Unit:**

conducts basic and translational molecular oncology research thereby providing solutions in oncology research using avant-garde biochemistry, pathology, computational and molecular biology tools.

## **Non-Communicable Diseases & Cosmetology Unit:**

focuses on research and evaluation as well as partnership and collaborations designed to eliminate dangerous chemicals linked to chronic diseases (Non-communicable diseases) from cosmetics and personal care products and provide safe alternative solutions.



# Biochemistry & Nutrition Department

1. **Attune Nxt Flow Cytometer:** Acoustic principled flow cytometer with increased sensitivity. It's applications range from immunophenotyping in blood cells, anticancer studies, mechanistic evaluation of protein expression in gene expression studies.
2. **CO<sub>2</sub> Incubator:** Used for the culture and maintenance of mammalian cell lines.
3. **Nano drop:** Used to measure nucleic acid concentrations in samples and to measure purity of nucleic acids in samples
4. **Biochrom 400 Microplate Reader:** Plate format spectrophotometer with fixed wavelengths ranging from 405, 450, 590, and 620 nm. It's applications range from Enzyme linked Immunosorbent assays (ELISA) to protein concentration estimation and other spectrophotometric quantification using specified wavelengths.
5. **Hot-air oven:** For drying
6. **Electrophoresis machine:** To separate charged molecule like DNA
7. **MRC Refrigerated Centrifuge:** A multi bucket with varying speed up to 21000g (RCF).
8. **Biospectrum imaging system:** Imaging and analysis of chemiluminescence, bioluminescence, fluorescence and colorimetric samples.
9. **Upright Light Microscope with Digital Camera:** Microscopic imaging with digital camera++



# Clinical Sciences Department

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The Clinical Sciences Department function in three key areas:

- Research
- Clinical Service
- Capacity Development

There are five Research Units in the Department:

- Child and Adolescent Health Research Unit
- Communicable Diseases Research Unit
- Maternal and Reproductive Health Research Unit
- Non-Communicable Diseases Research Unit
- Epidemiology and Biostatistics Research Unit

## **HIV Treatment**

The Department has one of the largest HIV care and treatment centers in the country with cumulative enrolment above 25,000.

## **HIV Adolescent Clinic**

The very first adolescent clinic for teens infected and affected by HIV holds every 2<sup>nd</sup> Saturday of the month.

## **TB DOTs Center**

Comprehensive TB services are provided at our DOTS Centre.

## **Research Clinics**

The Department runs the following Research Clinics:

- Child and Adolescent Health
- Hepatitis and Gastroenterology
- Hypertension/Cardiology and Nephrology
- Reproductive Health Research

The Department has an effective Memorandum of Understanding (MOU) with the Federal Medical

Centre, Ebute-Metta for Clinical Services and Clinical Research.

## **Demographic and Health Surveillance System (DHSS)**

Demographic and Health Surveillance System (DHSS) has been established at Ijede in Ikorodu, LGA, Lagos with the following initial results:

52 Enumeration Areas characterized have been characterized with 2,172 households with a population of 8,214 ((M: F ratio = 1:1) age < 20 years = 47.5%, women of child-bearing age = 1,653 (20.1%).

Routine surveillance is going on at the site.

## **Laboratories**

The Department has a Research Laboratory with capacity for hematology, clinical chemistry, serology, parasitology and molecular techniques (PCR Machine).

# Clinical Sciences Department

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# Clinical Diagnostic Laboratory

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Clinical Diagnostic Laboratory (CDL) provides quality and efficient clinical laboratory diagnostic services for both staff and members. The Laboratory also provides support for research and training of interns, undergraduate and post graduate students in collaborations with Universities and other higher institutions.

There are seven (7) sections within the laboratory; these are:

## **Haematology section:**

For routine and specialized diagnosis of blood disorders eg Investigation of clotting disorders (clotology), haemoglobinopathies, enzymopathies etc

## **Medical microbiology (bacteriology, parasitology and mycology) section:**

For investigation of microbial causes of infectious diseases and drug susceptibility testing.

## **Chemical Pathology/endocrinology section:**

For investigation of hormonal disorders ie metabolic hormones, reproductive hormones, thyroid hormones, tumour markers, etc.

## **Immunology section:**

For assay of alloantibodies / isoantibodies, autoantibodies, allergens, markers of inflammatory reactions eg alpha feto proteins etc.

## **Serology section:**

For investigation of serological markers of several infectious agents such as Chlamydial, H. pylori, HIV, viral Hepatitis etc

## **Food handlers' fitness laboratory services:**

For screening of staff of food companies, cafeterias, kitchens, pre-employment screening of domestic staff etc

## **Kits/Reagent evaluation section:**

to validate/evaluate reliability/suitability for use in Nigerian medical diagnostic laboratories. Staff of the laboratory are members of National External Quality Assurance (EQA) team forevaluation of laboratory diagnostic kits.

# Clinical Diagnostic Laboratory

1. **TC Matrix Automated Chemistry Analyzer:** For Liver Function Test, Lipid Profile and other Cardiac Markers
2. **Bio Safety Cabinet Class 2B:** To ensure biosafety environment when used to process highly infectious clinical samples such as sputum for fungal and Tuberculosis studies.
3. **Sysmex Automated Hematology Analyzer (15 Parts):** For Full Blood Count With Differentials, Platelets Counts, And Other Hematology Parameters.
4. **ISE Chemistry Analyzer:** For Kidney Function Tests.
5. **Semi-Automated Biochemistry Analyzer:** Used for analyzing chemistry parameters such as Liver and Kidney function tests, cardiac markers, etc.
6. **Architect I1000:** For Immunoassay e.g. Hepatitis Antibody Profiles.



# Molecular Biology & Biotechnology Department

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Molecular Biology and Biotechnology Department (MB & BT) is involved in research and training. It has five research laboratories which are supported by NIMR Central Laboratory, Central Public Health Laboratory, Lagos and Molecular diagnostics and Clinical Chemistry Research Lab, University of Lagos. The Laboratories are;

## **Molecular Epidemiology**

### **Laboratory:**

focuses on the characterization of virulence genes, antibiotic resistant genes and genetic diversity in pathogens isolated from clinical food, soil and water samples. The laboratory has expertise in fluorescence in situ hybridization (FISH) and gene expression using fluorescent microscope and real-time PCR, Western blot and Protein Analysis and Support research & training in Molecular Biology techniques which is open to Undergraduate, Pre-doctorate, Postgraduates and Public health personnel.

### **Genetics & Theranostic Laboratory:**

support research activities and training in biogenic synthesis of nanoparticles, genetic analysis of immunological factors associated with susceptibility to communicable and non-communicable diseases as well as genetic transfer experiments and subsequent expression in *E. coli*. Expertise in this laboratory include multiplex-PCR design, nanoparticle synthesis using chemical and biological methods, gene sequence variation analyses and genome mining. The Lab has a remote operated, cloud supported Thermal cycler

(SimpliAmp) for running multiple PCR assays, multiplex PCR assay, touchdown PCR and reverse transcriptase PCR assays. SDS-PAGE system is also available for protein isolation and characterization.

### **Molecular Diagnostic Laboratory:**

focuses on the development diagnostics for pathogen identification, running cytokine assays and detecting novel proteins using locally made DNA extraction kits, gradient PCR, ELISA system and Western blotting apparatus.

## **Respiratory Disease Research**

**Laboratory:** focuses on identification, characterization and genomic epidemiology of some selected respiratory bacterial pathogens (e.g. *S. pneumoniae*, non-tuberculous mycobacteria etc) of public health threats in Nigeria

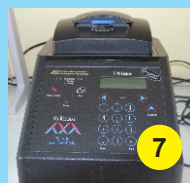
### **Probiotic Research Laboratory:**

focuses on the identification and characterization lactic acid bacteria from food sources and subsequent exploration as probiotics in pre-clinical experiments using anaerobic culture system and PCR among other tools



# Molecular Biology & Biotechnology Department

1. **QPCR:** (Qualitative PCR or Real-time PCR) Thermal cycler for real-time amplification and analysis of PCR runs.
2. **Semi dry western blotter:** allows for quick and easy simultaneous western blotting.
- 3 **SimpliAmp Thermal Cycler:** Cloud enabled, remote accessible and easy-to-use thermal cycler which uses veriflex temperature control technology to enable simple and accurate condition amplification.
4. **Liquid scintillation Centre:** Used in a procedure called the Urea Breath test (UBT) "for counting" H.pylori levels in patients.
5. **Magnetic stirrer with heater:** Equipped with a heating platform and magnetic stirring base for simultaneous heating and stirring of reagents or mixtures.
6. **White Light Box:** Used to provide perfect amount of light for photography of electrophoresis gels.
7. **Thermal cycler with Gradient Capability:** Gradient enabled thermal cycler for amplification of DNA in PCR runs.
8. **UV Transilluminator with photo documentation system:** Equipped with an ultraviolet lamp for visualization of DNA 'bands' on agarose gel after electrophoresis.



# Public Health & Epidemiology Department

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The Department of Public Health and Epidemiology has three units: Molecular Parasitology, Entomology/Vector Control, and Epidemiology/ Health Policy and Systems.

## **Molecular Entomology Laboratory**

focus is on malaria and arbovirus disease vectors: dengue, yellow fever and Zika. The laboratory is equipped with Photo-microscopes, PCR thermal cyclers, photo documentation, gel electrophoresis system, spectrophotometers, incubator and -80oC freezers. Several equipments in NIMR Central Research Laboratory including HPLC and DNA sequencers are also available for research on insect's molecular biology. The Laboratory has proficiency in vector biology surveillance and skill in molecular techniques. Our "experimental platforms" provide excellent channels for evaluating the effectiveness of new vector control tools including insecticide nets and repellants. We offer training opportunities and educational materials to help the public learn about vectors, vector-borne diseases, and their control.

## **Oncho/STH Laboratory**

runs ELISA assay for the Ovi6 antigen for the detection of antibody in a sentinel population of children as a marker of either interruption or continued transmission of

Onchocercavolvulus.

## **Molecular Parasitology Research Laboratory**

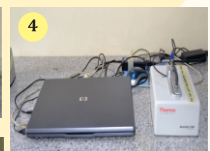
focuses on epidemiology and molecular studies of schistosomiasis, lymphatic filariasis soil-transmitted helminthiasis, toxoplasmosis, toxocariasis and Buruli ulcer. The laboratory also serves as a reference center for the molecular diagnosis of Buruli Ulcer in Nigeria.

Our laboratories offer undergraduates, postgraduates and Public Health Officers training opportunities and educational materials to help learn about vectors, parasites, vector-borne diseases, and their control. All the laboratories in the department are reference laboratories for the Federal Ministry of Health and are involved in the National control programmes of the various diseases.

# Public Health & Epidemiology Department

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1. **Photo Documentation System:** used for documenting gel pictures
2. **PCR Thermal Cycler:** for amplification of DNA
3. **Immunowash Microplate Washer & Imark Microplate Reader :** used for enzyme linked immunosorbent assay.
4. **Nano Drop:** used for quantification of DNAs in samples
5. **CFX Connect Real-Time System:** Real-time PCR

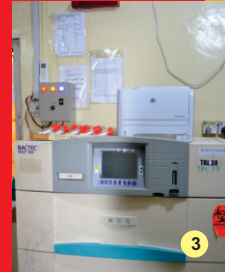




# Microbiology Department

## EQUIPMENT DESCRIPTIONS

1. GeneXpert Assay: To detect mycobacterium tube
2. Giant Autoclave: To sterilize media/reagents.
3. MGIT 960 BACTEC TB System: For liquid culture and DST of Mycobacteria.
4. 3130 XL Sequencer: HIV Drug resistance testing
5. Biomic V3: It is a semi-automated bacteria identification system by BD Technical
6. Gelamire Flow laboratories twin 30: For laminal flow. For preparing reagents; used to prevent contaminants.
7. GT Blot: To detect mycobacterium tuberculosis, Isoniazid and rifampicin resistance.
8. Cobas C 311 Analyzer: For clinical chemistry
9. Cobas 6800 & 8800: For running HIV viral load



# Microbiology Department

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The department houses two national reference laboratories namely: Center for Human Virology and Genomics (CHVG) and Center for Tuberculosis Research (CTBR). Both research centers are internationally recognized as they have ISO 15189 accreditation.

CHVG is one of the 14 laboratories globally, and only laboratory in West Africa listed for WHO Prequalification. The third division in the department is named Diarrhoea, Immunology and Parasitology Research (DIPR) Division. DIPR aspiring for international accreditation. Research, training and services are the three pillars upon which the department stands. The department is also involved in

- \* Molecular surveillance of pathogens
- \* Sequencing and Bioinformatics
- \* Tissue Culture Preparation of viral and bacterial panels
- \* Evaluation of In vitro Diagnostics
- \* Training and auditing of Quality Management Systems
- \* Biorepository

## Research Innovation & Product Development (RIND) Unit

The Mandate of the unit is to translate research ideas into tangible biomedical products by producing affordable easy-to-use indigenous medical products to improve the narratives of research and development in Nigeria.

Our aim is to explore the huge human & material resources of Nigeria to provide cost-effective solutions and save the much-needed foreign exchange for the country as regards production and availability of basic medical equipment and reagents. **NIMR-RIND** has developed a number of medical products and services such as: Biomedical Equipment, Diagnostic kits and Services:

### Equipment

1. **NIMR BIOTECH-Electrophoretic Machines:** Haemoglobin Genotypes can be determined using the cellulose acetate electrophoresis technique. A small quantity of blood is placed on a tile and mixed with two drops of saponin to lyse the blood. With the aid of an applicator stick, the haemolysate is placed on the cellulose acetate paper and electrophoreses in Tris buffer solution for 2-5 minutes at 220v. Hemolysate from blood samples of known HbAA, HbAS, HbAC, HbSS and HbSC are used as control. The advantages of this equipment includes its Fast band separation time (2-3mins) and its 100% Sensitivity, specificity easily available and pocket friendly.
2. **NIMR BIOTECH-Hematocrit Centrifuge:** The equipment is used for fast assessment of blood level in diagnosis of anaemia with centrifugal rotation from 000-10000rpm/minutes<sup>3</sup>
3. **NIMR BIOTECH-Biological Incubator:** The equipment is used in microbiology laboratory for incubation of culture plates
4. **NIMR BIOTECH-Laboratory fitted Oven:** The equipment is used in laboratories for drying of glass wares and ther drying purposes
5. **NIMR BIOTECH-Bucket Centrifuge**

*Some of the Equipments have been tested and validated by external quality assessment (NIMR BIOTECH-Electrophoretic machines), others are being validated.*



# Research Innovation & Product Development (RIND) Unit

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**NIMR BIOTECH-DNA/RNA extraction kits:** The NIMR Biotech DNA (Deoxyribose nucleic acid) preparation kit is a simple, fast, and reliable method for the extraction of high-quality genomic DNA from a variety of samples. The kit is based on the silica-based (spin-column) technology that involves the selective binding of DNA to a silica-based membrane in the presence of chaotropic salts.

The kits have been successfully used to isolate DNA from a variety of samples including bacteria (both gram positive and gram negative), animal tissues (examples includes fish and snails), whole blood samples, dried blood spot, and formalin-fixed paraffin embedded tissues, showing optimal purity and yield, and suitable for downstream molecular biology applications like PCR and RAPD.

The buffers included in the kit include a lysis buffer which is used with Proteinase K to digest cells or tissues, and also contains EDTA to inhibit nucleases. Lysis also involves a detergent which aids protein denaturation, and is completed at 56°C. The proteinase K included in the kit was also prepared to be stable at room temperature for up to a month. However, long term storage in the cold is still recommended. A binding buffer containing a chaotropic salt will then be added to the sample with ethanol, before passing through the silica-gel spin column. Our binding buffer is optimized for effective DNA binding to improve DNA yield.

## Advantages of the NIMR Biotech DNA Purification Kit

- A. Fast and efficient extraction of high quality DNA from a wide range of samples
- B. Low cost compared to the high-end commercial DNA purification kits currently used in the country
- C. Locally manufactured, and will be prepared on demand, making it freshly made but still readily available.
- D. Easy to use for genomic DNA isolation





# Research Innovation & Product Development (RIND) Unit

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## DIAGNOSTIC KITS:

**NIMR BIOTECH Point-of-Care Diagnostic Kits:** The kits are developed as a fast point-of-care PCR assays to differentially diagnose the top ten etiologic agents for febrile illness in Nigerian Children. The kits can differentially detect the top 10 causes of febrile illness in children, including malaria (*Plasmodiumfalciparum*), typhoid Fever (*Salmonellaentericaserovartyphi* and *paratyphi*), *Streptococcuspneumoniae*, *Brucellaabortus*, *Leptospirainterrogans*, Dengue 1 & 2 viruses, Yellow fever virus, Rotavirus A and Chikungunya virus.

**NIMR BIOTECH NimCure Project :** NimCure is a digital tool which employs Remote-Observe-Therapy (ROT) for the management of TB treatment. Through ROT, treatment is more personalized and patients become more active in managing treatment. It is a collaborative research and development project, with the aim of assessing the impact of digital health for adherence in Tuberculosis (TB) therapy.

NimCure is a patient care application that enables both patient and caregiver to efficiently manage TB disease. We hope the product will significantly increase the adherence rate of TB patients using ROT, thereby making ROT the standard method for managing TB treatment. In addition, the NimCure app will be available for use by the general public.

**RIND SERVICES:** We also carry out direct repairs, servicing and maintenance of the following:

- \*Laboratory equipment
- \*Theatre lamp
- \*Baby incubators
- \*Suction machines
- \*Autoclaves
- \*Hydronicbeds
- \*Operating tables etc



# Central Research Laboratory

Support other laboratories in the institute by providing access and use of key equipments for research innovation and training. We also offers customised training and gives research support involving the use of capillariy sequencing, HPLC to researchers within and outside Nigeria

1. HPLC Agilent 1260 Infinity II: used to identify and validate protein bio-makers, it is used to discover, identify, characterize and quantify protein or antibodies.
2. Motic SMZ-171 Microscope: Used for tissue and cell examination. It helps to differentiate normal tissues from pathological, cancerous or abnormal growth tissues using very high magnification.
3. GenXpert: Used for Human Papiloma Virus (HPV) test, HIV Viral Load, and Tuberculosis Test.
4. SeqStudio PC model: is an all-in-one easy to use reagent cartridge that includes capillaries, universal polymer, buffer, and pump required to run on the seqstudio generic analyzer system.
5. Roll-in incubator: used for CO<sub>2</sub> incubators are mainly used for cell culture and provide control over factors such as temperature, co<sub>2</sub> for maintaining proper PH level.



# Library & Information Communication Technology Department

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The Department comprises six (6) Divisions:  
Reader Services, Technical Services, Desktop Publishing,  
Website Management, System Network and Maintenance,  
Communication & Media Divisions.

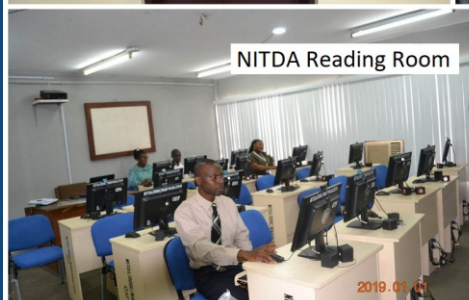
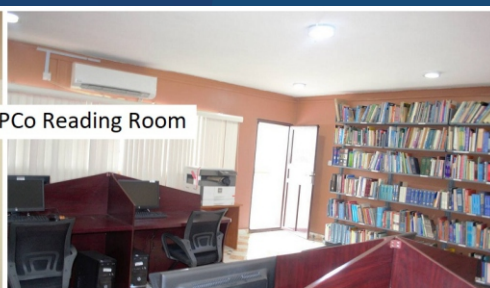
The Expertise of the department  
includes:

- \*Medical Librarians
- \*Information scientist
- \*System Designers
- \*Computer Programmer

- \*Database Management Expert
- \*Communication professional
- \*Public relations professionals
- \*Health Information Management Professionals



NNPC/SNEPCo Reading Room



NITDA Reading Room



CCHub Reading Room

## Researcher's Suite

A twine two story building with 24hours uninterrupted internet connectivity. The Researcher's suite was built to accomodate Researchers Nationally & Internationally to do bench work, conduct research retreat and proposal writing meeting in the institute



# Animal House

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# Corporate Marketing & Communication Unit

NIMR Corporate Marketing & Communication Unit is to explore all avenues of raising funds legitimately for the institute. The general public is the target audience.

The department is made up of marketing & operational arm.

**STRENGTH:** \*Strategic Location, \*Strong Brand & Public Presence, \*Committed Staff, \*Strong Marketing Drive

The Unit is a member of RIND committee: The aim is to source for sponsorship, advertise and market the institute product.

Conference Rooms, Car Park, Open Ground Facilities available for training, events, occasions and parties



## Auditorium

- ▶ Over 300 Seater Capacity
- ▶ Fully Airconditioned
- ▶ Comfortable Seats
- ▶ PA System and Projector Available



## Conference Rooms

- 10 - 45 seater
- Conference Rooms
- Ambient Environment
- Fully Airconditioned
- Projector & PA System



## CAR PARK

- 80 + Car Park
- Fully Secure
- Well Demarcated



## Seminar Room

- 20 - 30 seater
- Seminar Rooms
- Ambient Environment
- Fully Airconditioned
- Projector & PA System