



**Makerere University Biomedical
Research Centre (MakBRC)**

ANNUAL REPORT 2021 - 2022



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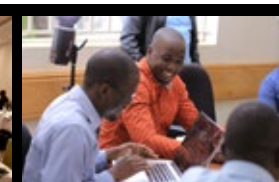
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MESSAGE FROM BOARD CHAIRPERSON



Assoc. Prof. William Buwembo, Board Chair (MakBRC)

It is with great pleasure that I present to you the second Annual Report of the Makerere University Biomedical Research Centre (MakBRC), which captures our performance for the year 2021-2022. The Centre is committed to demonstrating integrated thinking and value creation for our stakeholders, as well as sustainability for the future as we work towards championing biomedical sciences.

The MakBRC Board of Directors remains committed to providing an enabling corporate governance framework and supporting the company to achieve its five-year strategic plan.

I take this opportunity to reassure our stakeholders that the MakBRC is a center of sound repute, premised to build on its achievements. Our highly experienced leadership coupled with a competent team of staff members will always strive to deliver exceptional performance against the set targets.

On behalf of the Board of Directors, I thank all our stakeholders for supporting the organization. I equally thank the management and staff for innovatively transforming the company to what it is today.



Prof. William Buwembo
CHAIRMAN BOARD OF DIRECTORS

Foreword from the Ag. Managing Director MakBRC/ Dean School of Biomedical Sciences



*Prof. Moses Joloba, Ag. Managing Director MakBRC / Dean
School of Biomedical Sciences*

It gives me great pleasure to present the Company's Second Annual Report 2021-2022. The second year has been remarkable, with the organization performing exceedingly above its set targets.

Our Performance and Achievements:

The gross impact of Ebola Virus disease epidemic and Covid-19 pandemic nationally and globally was unprecedented however, MakBRC weathered this storm and performed beyond expectations. we conducted in-house capacity building programs; We have provided care to the university community and beyond. We established an online financial request system attracted numerous funded projects and

our team wrote many grant applications.

Support to the College of Health sciences and School of Biomedical Sciences: MakBRC works closely with our mother institution, the School of Biomedical Sciences (SBS) at the College of Health Sciences. We have worked with all nine constituent departments of the school by supporting the laboratories, training staff, as well as students.

Prospects for the year ahead:

In the next year, we shall continue working towards attaining our 5-year strategy. Specifically, we shall focus on promoting innovations, supporting our units and staff to serve efficiently. As well as

providing the state of the Art services to researchers.

Although it has been a very challenging year characterized by uncertainty such as the Ebola epidemic, we have delivered tremendously. I thank the Board for providing us with direction and supporting the company in all ventures. Above all, I convey my appreciation to the Management Team and Staff whose resilience and innovativeness has always shone.



Prof. Moses Joloba
Ag. MANAGING DIRECTOR

ABOUT MAKERERE UNIVERSITY BIOMEDICAL RESEARCH CENTRE (MakBRC)

Makerere University Biomedical Research Centre (MakBRC) is a Ugandan registered Not-for-Profit Organization fully owned by Makerere University established within Makerere University College of Health Sciences, School of Biomedical Sciences, as a new mechanism to advance research, innovations, laboratory services, clinical care, training and resource mobilization.

The Makerere University School of Biomedical Sciences tasked a committee to benchmark existing centers of excellence within Makerere University and develop a proposal on how best the School of Biomedical Sciences could establish a Centre of Excellence (CoE).

The school presented the proposal to the various University organs that approved it. This led to the establishment of Makerere University Biomedical Research Centre on 7th August 2020.

On the 2nd day of September 2020, MakBRC was officially inaugurated at a function that was held at the Central Teaching Facility II, during which the Board meeting of the company was convened.

1.2 Objectives

1. To develop the capacity of health care practitioners in cutting-edge techniques.
2. To promote and conduct research in biomedical sciences.
3. To innovate, translate and market new technologies.
4. To strengthen and promote better laboratory services
5. To improve prevention, care and treatment of diseases
6. To support health systems to develop capabilities to prevent, detect and respond to infectious disease outbreaks and biologic threats

1.3 MakBRC Focus Areas

- i. **Support the core activities for MakBRC including Training thus** Training students in new cutting-edge techniques in biomedical sciences.
- ii. **Support & Conduct Research:** To promote and conduct research in biomedical sciences.
- iii. **Innovations, Partnerships & Collaborations.**
- iv. **Community Service.**
- v. **Improve the health care of Ugandans, Africa and beyond,** resource mobilization, mobilize funds and resources for sustainability of the company.



SUPPORT IN TRAINING

1.4 Support

Training students in new cutting-edge techniques in biomedical sciences

Contribution to the School of Biomedical Sciences

Support to the School of Biomedical Sciences

Support for Higher Degrees committee

Support for Medical Illustration department

Support for Anatomy department

Support for Physiology department

Support for Biomedical Engineering department

Support for Pathology department

Administration Support to Graduate student projects from various sponsors

- Case Western Reserve University
- Infectious Disease Institute
- St. Andrew's University
- Makerere University Lung Institute (ECBS)
- IDRC (Infectious Disease Research Collaboration)
- UVRI Centre of Excellence in Infection and Immunity Research and Training (MUII-Plus)

Contribution of MakBRC to school of Biomedical Sciences Departments

Department	Critical ongoing support
Pharmacology	Grants Mgt, PART Laboratory support, Equipment service and maintenance, business incubation.
Anatomy	Laboratory support, Equipment service and maintenance, business incubation project.
Biomedical Engineering	Support to Equipment Workshop, Business incubation
Microbiology	Grants Mgt, Laboratory support, Equipment service and maintenance, business incubation.
Immunology and Molecular Biology	Grants Mgt, 22 PhD & 50 students currently supported, Laboratory support, business incubation, cross-cutting courses.
Pathology	Grants Mgt, Laboratory support, Equipment service and maintenance, business incubation.
Biochemistry	Equipment service and maintenance
Physiology	Equipment service and maintenance

HUMAN RESOURCE SUPPORT



MakBRC Human Resource Structure

S.N	Position
1.	Ag. Director
2.	Internal Audit
3.	Operational Manager
4.	Finance & Strategic Planning.
5.	Research and Clinical Services
7	Head. Laboratory.Services
9	Administration
10	Head, Legal
11	Head, Human Resource
12	Clinical Trials UNIT
13	QA/QC:

Human Resource at MakBRC

MakBRC has continued to address the issues of human resource in the School of Biomedical Sciences.



The following staff categories have been contracted by MakBRC.

- Core Centre staff - 26
- Project staff supported by the Centre - 120
- Laboratory staff supported by the Centre - 40
- Support staff at the school of biomedical sciences supported by MakBRC



MakBRC Staff

SUPPORT IN TEACHING AND LEARNING



DEPARTMENT OF PATHOLOGY



Dr. Hawa Nalwoga Director MakBRC / Head of Department Pathology

The department of Pathology is a discipline which is responsible for diagnosis of diseases, life style diseases like cancer diabetics, the department is also involved in teaching and training of medical students both at undergraduate and masters level.

Contribution of MakBRC towards the Department of Pathology

MakBRC is doing a good job in terms of Human Resource and this makes work easier for the department in one way or another. MakBRC recently recruited someone in the pathology department this in one way promotes the awareness of pathology services among health care providers.

MakBRC has supported and serviced the equipment in the Pathology department and this has enabled the department in extending services to the students and the Makerere University College of Health Sciences Community.

Future Engagement

MakBRC needs to create more awareness and sensitization of the services they offer such as innovations and contributions. This will enhance its visibility across the departments in the college of Health Sciences.

I wish them success in all their future endeavors.

DEPARTMENT OF PHYSIOLOGY

MakBRC's Contribution to various Departments under School of Biomedical Sciences



*Dr. Robert Kalyesubula, Head Physiology Department
Director MakBRC/ HOD*

It was such a challenging year associated with Covid19 and epidemic of Ebola, we have however, come out better equipped with new skills to handle a changing world. For example, we have been developing online lectures and using new technologies to mark exams.

Key outstanding support by MakBRC in the department of Physiology

1. MakBRC has supported at least two masters' students in the Department of Physiology.
2. Been able to support the storage and analysis of the research samples including the MakRIF study.
3. MakBRC has supported the department in the storage and analysis of the research samples including the one ranking study.
4. MakBRC has been very supportive during the application for grants process and submission.
5. The grants unit at MakBRC has also been supportive in the preparation and submission of grants proposals and this has enabled the department to thrive.

Future Engagement

- i. Refurbishing the lab in the physiology cell laboratory technology.
- ii. Cardiorespiratory Lab, this will help in evaluating diseases related to Cardiorespiratory Health.



On left Dr. Robert Kalyesubura at the Conference on Improvement on Quality Health Care in Berlin-Germany



Dr. Robert Kalyesubula, Head of Department Physiology in Berlin.

DEPARTMENT OF IMMUNOLOGY & MOLECULAR BIOLOGY



Dr. David Kateete, Head of Department Immunology & Molecular Biology / Director MakBRC

MakBRC and the Department of Immunology & Molecular Biology, CHS

Immunology & Molecular Biology is one of the newest Departments at the College of Health Sciences (CHS), established and operationalized by the university in 2016. The Department is home to the H3Africa Biobank, and has three state-of-the-art laboratories i.e., Molecular Diagnostics, Molecular Biology and Immunology, and a Genomics/Bioinformatics unit. The department has 8 academic staff and supports up to 70 laboratory scientists/technologists and 4 research administrators. As Makerere University transitions to being a research-led institution, MakBRC facilitates the department to remain a vibrant center of research and learning hence, institutionally relevant and performing the core functions of the university i.e.;

- 1. Teaching and Learning.** The department has a low staffing level generally in that there are only 8 academic staff primarily employed by Makerere University Council. Yet, the department is home to several undergraduate/graduate courses and four

graduate programmes i.e., Master's in Immunology & Clinical Microbiology (MICM), Master's in Bioinformatics (MSBT), PhD in Bioinformatics (PBIO), and traditional PhD training by Research only. The department has approx. 150 continuing graduate students and the above programmes attract an average of 60 registered students per year. MakBRC supports postdoctoral research scientists that contribute significantly to the teaching and learning of both graduate and undergraduate students on the above-mentioned courses/programmes. Note that as of now, the department lacks a university-appointed secretary and university-appointed lab technicians; MakBRC supports laboratory staff who participate in the teaching and learning at the department.

- 2. Research.** The department is a vibrant research center and is one of the biggest generators of new scientific knowledge at the college; on average the department produces 50 peer-reviewed publications per year. The research activities generating these outputs are supported by grants managed by MakBRC.
- 3. Resource mobilization.** Department faculty attract on average research grants from the Ugandan government, MakRIF and development partners amounting to a tune of approx. 5 million US dollars per year. Most of these grants are managed by MakBRC, which provides the requisite conducive research environment.
- 4. Service to the community.** MakBRC staff provide community service in form of COVID-19 testing, and being part of the emergency response teams by the ministry of health in case of epidemics.

To conclude, MakBRC is extremely essential as it supports the department to fully perform her core functions as an entity of the university. There should be more areas of engagement between MakBRC management and the department staff for a discussion on how to broaden the support.

DEPARTMENT OF MICROBIOLOGY



Associate Prof. Benon Asiimwe, Chair Microbiology Department. / Director MakBRC

MakBRC has supported the management of Human Resources, especially Laboratory and Support staff who are on contract basis in the department. More importantly, MakBRC has supported our Quality Control/Assurance management system, so much that the department's Clinical Microbiology Laboratory is now accredited, certified by the College of American Pathologists (CAP). This means that our services are now of international standards. As a result of this, the sample volume has increased because more researchers are coming to the department for our services. With support from various projects coming to the department, we have acquired automated state of the art equipment for culture and antimicrobial susceptibility testing, among others. MakBRC has supported the department by putting in place service contracts for all these equipment, ensuring timely service and efficient operation. Furthermore, MakBRC manages all the grants

coming to the department. This has eased procurement related challenges, with a quick turn-around time from request. Finally, MakBRC assists the department in financial management and control of all our funds, easing accountability challenges especially for staff who are not trained in financial management.

Recommendation

MakBRC should note that Heads of Department are the accounting officers at that level. Therefore, all expenditures from departmental accounts, award/renewal of staff contracts, and signing of MoUs with Principal Investigators or any other funders should have a provision for endorsement by the relevant Head of Department to ensure transparency and accountability.

CONTRIBUTION TO PHARMACOLOGY



Dr. Jackson Mukonzo, Head of Department Pharmacology & Therapeutics

Makerere University Biomedical Research Center

MakBRC the concept is good, the potential is there and the good will. MakBRC has performed well right from its inception to date; however, the potential is not fully exploited, there is still work to be done, externally and within the organization to enable it achieve its full potential, this requires the support of Makerere University and all other affiliated institutions for it to happen.

Contribution

MakBRC has supported a number of projects running. It has also supported the administration and core departmental activities. Particularly the human resource component. MakBRC supported the painting and renovation of the pharmacology building both inside and outside.

Recommendations

Makerere University, should be more outward looking, the staff of MakBRC should focus and put their mind and attitudes on the concept behind the formation of MakBRC taking into consideration that it is now a public institution.

Future Engagement

MakBRC needs to enhance its visibility through engagement with several stakeholders, promote its vision, carry out sensitization campaigns and awareness particularly on the services they offer across the globe.

I wish them success in all their future endeavors



MAKBRC SUPPORT TO MEDICAL ILLUSTRATION



Mr. Lukiza Paul, Head of Department Medical Illustration/ Director MakBRC

Medical Illustration is currently headed by Mr. Paul Lukiza. The department has about 04 Academic Staff, 01, Laboratory staff and apparently no support staff.

MakBRC's Contribution to the Department

MAKBRC has equipped the department with a multi-purpose equipment (Camera) for audio and visual images. Through our interactions with MakBRC, they pledged to buy more equipment for the department so as to improve support to teaching of gross and microscopic anatomy. Using these gadgets will extend services to other departments like Pathology, taking, recording morbid specimens and digitalizing the analogy pot room in order to create a digital museum.

What I propose MakBRC should focus on in her Next Plan

Need to have all the laboratories in other departments accredited to attract more credible research projects and research outcomes. This will in turn enhance the teaching and learning particularly in the departments of Physiology, Microbiology, Pharmacology, Biochemistry and Pathology. MakBRC needs to invest in state-of-the-Art equipment that could support teaching, learning and practicals in these departments.

In the near future, we also need to engage MakBRC to make medical animation and virtual reality technologies part and partial of the teaching research and learning experiences in the College of Health Sciences, Makerere University

The innovations, should also offer other grant support services/management and writing skills to enable the growth of the School of Biomedical Sciences.

My wish is to see MakBRC becoming a driving force not only in East and Central Africa but in the whole of Africa, in the area of Biomedical health research and innovations.

Recommendation

MakBRC's innovations and outputs should be patented. The innovations, the new ideas and discoveries developed by MakBRC, should be transformed into bigger projects like factories, commercialization industries, this will not only benefit the students to acquire skills but Makerere University and the country at large.

Finally, MakBRC should aim to attract more partners & collaborators across the globe. This should create jobs for the biomedical graduates in the country.

DEPARTMENT OF BIOCHEMISTRY



*Dr. Steven Kiwuwa Head of Department, Biochemistry
College of Health Sciences Makerere University*

My take on the MakBRC Initiative.

It is hoped this initiative on behalf of the faculty at the school of biomedical sciences, it is hoped that this initiative will improve the efficiency of research and medical training through leverage of the available human and physical resources at the college of health sciences. It also seeks to serve as a successful university led model for corporate governance and image in biomedical research.

Contribution of MakBRC to Teaching, Training & Research.

The Biomedical research center has played a crucial role in advancing medical knowledge and improving health outcomes. These center has multidisciplinary teams of researchers who work collaboratively to develop new diagnostic and therapeutic approaches for various diseases. It has been also able provide opportunities for training and mentorship for students, postdoctoral

fellows, and other researchers who are interested in biomedical research.

At Makerere University, the Biomedical Research Centre at the College of Health Sciences has contributed to teaching and training by offering courses, workshops, and seminars on various aspects of biomedical research. These activities have provided students and researchers with opportunities to learn about the latest developments in their fields, gain practical skills, and network with other professionals.

In terms of research, the Biomedical Research Centre continues to conduct studies on a wide range of topics related to human health, including infectious diseases, non-communicable diseases, and global health issues. It has built capacity in establishment of biorepository to support innovative global research. The center's research findings have been published in peer-reviewed journals, presented at conferences, and shared with policymakers and other stakeholders. These contributions could help improve health outcomes and inform public health policy in Uganda and beyond.

Overall, Makerere Biomedical Research Centre at the College of Health Sciences plays an essential role in advancing medical knowledge, training the next generation of researchers and healthcare professionals, and improving health outcomes.

How best can MakBRC improve its visibility in the country

Improving visibility and competitiveness for a biomedical research center at Makerere University College of Health Sciences can be accomplished through a variety of strategies. Namely;

1. **Aim at Publishing research articles in reputable journals:** Researchers at the center can publish their research findings in high-impact peer-reviewed journals to increase the center's visibility and attract potential collaborators.

2. **Participate in conferences and seminars:** Attending and presenting at conferences and seminars can provide a platform to showcase the center's research activities and achievements to a wider audience.
 3. **Collaborate with other research institutions:** Collaborating with other research institutions can increase the center's visibility and competitiveness, particularly if the collaborating institutions have a strong reputation in their respective fields.
 4. **Maintain a strong online presence:** Having a website, social media accounts, and a newsletter can help the center to communicate its research activities to a broader audience, including potential funders and collaborators.
 5. **The biomedical research Centre should continue** to Seek funding opportunities and public private partnerships to support the research infrastructures. Applying for grants and funding opportunities from reputable organizations and foundations can help the center to support its research activities and attract attention from other researchers and institutions.
 6. **Establish partnerships with industry:** Establishing partnerships with pharmaceutical companies or other industries related to the field can help to promote the center's research activities, increase funding, and provide opportunities for translation of research findings into clinical practice.
 7. **Engage in science communication:** The center should participate in science communication activities, such as science festivals or public lectures, to engage with the general public and promote awareness of the center's research activities.
 8. **My personal recommendation towards MAKBRC.** The center should support the establishment of robust administrative, governance and accountability mechanisms, and human resource policies. To strengthen its operations and improve the transparency of its operations.
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BIOMEDICAL ENGINEERING UNIT

1.5. Department of Biomedical Engineering, College of Health Sciences



Dr. Robert Ssekitoaleko, Head of Department, Biomedical Engineering Unit

Contribution of MakBRC to the Department of Biomedical Engineering

MakBRC has got a great potential transformation of research and innovation in Uganda. As Biomedical Engineering we believe that this is a great platform to help us translate our ideas to the end user. MakBRC has been kind enough to give us a section of Biomedical Engineering where our team has got contracts to repair and maintain the Laboratory equipment in all the departments at the School of Biomedical Sciences. Our input has been highly appreciated and has attracted future interests outside the School of Biomedical sciences, particularly Baylor College of Medicine.

ACHIEVEMENTS OF MAKBME IN 2022

PROJECTS

This year, we worked on a number of projects, many of which were awarded grants. The majority of the projects were led by our BME staff, while others were collaborative efforts. Its important to note that these projects were not necessarily funded by MakBRC, however, MakBRC has created a conducive environment that supports and promotes research and innovation among the staff at the School of Biomedical Engineering. The projects are as follows:

Strengthening Research Capacity in Innovative Global Health Technologies for Non-Communicable Diseases in Uganda:

This project will increase the capacity of Ugandan universities and research institutions to conduct biomedical engineering research. This progress is required to encourage the development of health technologies by Africans for Africans. The grant number of this project is 1 D43 TW012260-01 and the funder is National Institute of Health. The Principal Investigators of this project are Dr Robert Ssekitoaleko and Prof Andrew Martin Rollins.

Duke Makerere Bio-Design Summer Fellowship: This eight-week program brought together Duke University Pratt School of Engineering students and Makerere University

Biomedical engineering students to create engineering solutions for Uganda's healthcare system. The students identified important unmet needs in local communities and hospitals. They designed engineering solutions to meet those needs and iteratively prototyped them in a local market space. The fellowship was funded by Dukeengage, and it was led by Dr Ann Saterbak and Dr. Robert T Ssekitoaleko.

I wish the MakBRC a great success, in the coming year as we believe that our growth is their growth too. We expect that in future we shall attract, more funding through MakBRC where we believe things will be more streamlined.

I wish MakBRC success in all their future endeavors

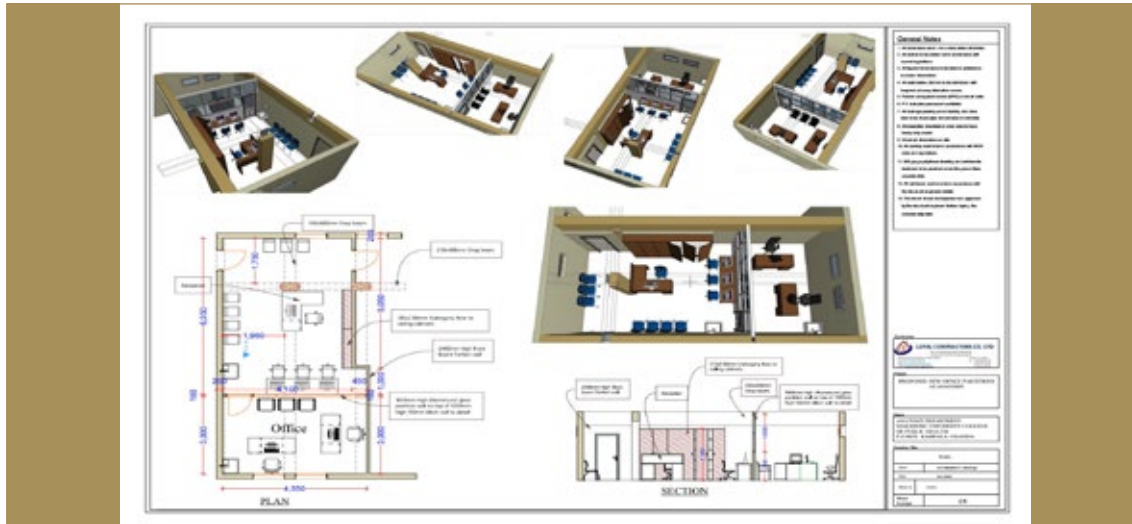
RESEARCH AND INNOVATIONS AT MakBRC



Research and Innovations at MakBRC

REMODELING AND MODIFICATION OF ANATOMY EMBALMING CENTRE

MakBRC thought about an idea of remodeling and modification of Anatomy Embalming Centre.



Proposed workstation without Office Furniture.

Biomedical Research Laboratories & Technologies

To promote and conduct research in biomedical sciences

Acquired new research technologies/ Capabilities:

Nanostring

Luminex

BGI Sequencing

HPLC



Quant studio 7 Flex machine (PCR machine)

This machine applies the sequence of DNA/ RNA

MakBRC Laboratories

Genomics and Molecular Biology

Biochemistry Laboratory

Physiology Laboratory

Pharmacology Laboratory

Makerere University Hospital Laboratory

Immunology Laboratory

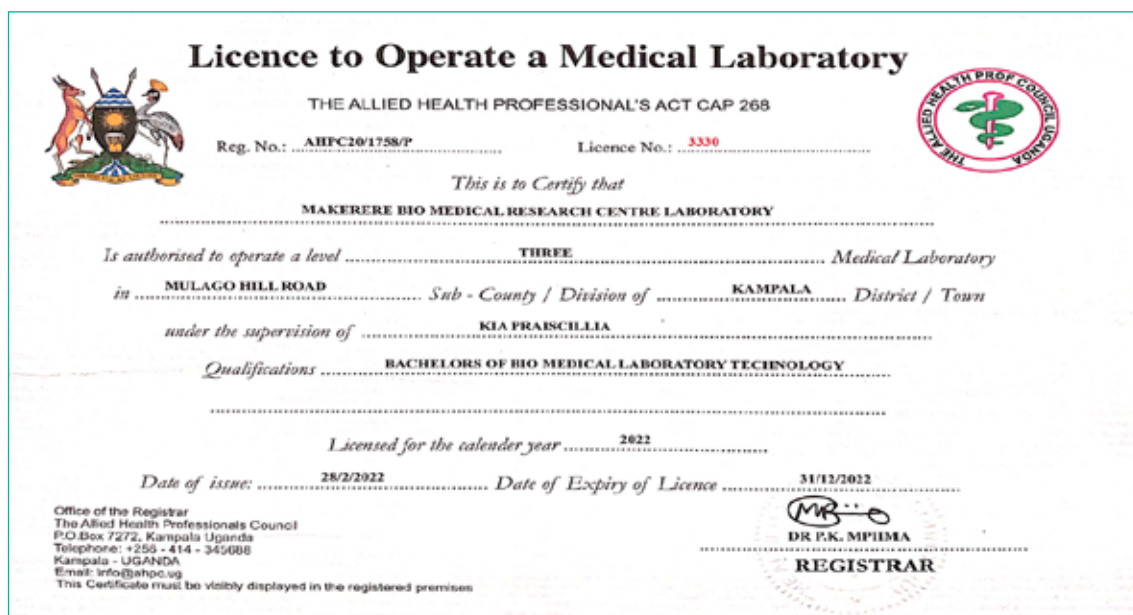
Mycobacteriology Laboratory

IBRH3AU Biorepository Laboratory

Genomics and Bioinformatics Laboratory

Medical Illustration Laboratory

Anatomy Laboratory



MakBRC State of the Art Equipment

BGI Sequencing partnership Nano String



Pharmacology Laboratories (Nano string machine) & Gene expression Analysis



HPLC technologies



High Performance Liquid Chromatography for Printing samples & Identification

Genexpert Ultra MTB/RIF.



It is used for running COVID 19 samples, TB samples and others

Performs 3 Genexpert tests;

- Genexpert Ultra MTB/RIF
- Xpress SARS COV2
- Genexpert XDR



Refrigerated Centrifuge machine it separates the specimens into liquid and solid parts

Achievements by MAKBRC Laboratories

Makerere University Biomedical research Centre, manages a repository centre with over 3million human, animal and plant samples used for research teaching and future diagnostics. Bio specimen samples, DNA, RNA, PBMCs, Serum, Plasma, etc are collected, transported and stored at IBRH3AU bio repository laboratory.

Highest number in the country

6,214 positives

Fastest turn around and highest quality

Mycobacteriology Laboratory

The laboratory had two external assessments (one onsite and the other virtual):

1. From 22nd -24th February 2022 the lab had an onsite TB Audit by PPD on behalf of DAIDS. The audit exercise was successful and the few observed audit findings were resolved by the end of August 2022.
2. On 11th May 2022, they had a CAP (College of American Pathologists) Accreditation virtual inspection. This inspection had been scheduled before 16th December 2020, the laboratory's CAP inspection anniversary date. However, it was never conducted due to effects of covid-19 pandemic coupled with movement restrictions. There was no citation and no deficiency found in the Lab. The lab was successfully awarded an operational certificate for two years.



BACFEC9120 for TB blood culturing (MGITBACETC960 Liquid culture)

1.5. Below are the audit findings from the TB Audit by PPD:

Good Clinical Laboratory Practice (GCLP). The laboratory had all trained in the GCLP offered by the Global Health Network (online). However, this online training was based on the obsolete GCLP standards (Version 3). The lab staff re-trained on the revised GCLP standards (version 4 September 2021) offered by DAIDS (online). Certificates of completion were obtained and filed for each labs.

Sample Reception, Sorting and Inactivation in BSL-3 (TB Laboratory)



For protecting sample integrity & for preventing mixing of contaminated air from sample processing area into the laboratory

1.7. Pipette Calibration:

At the time of the audit, Pipette calibration certificate was missing for one pipette used at the bench.

The lab obtained the calibration certificate from the external vendor (Measurement Solutions Ltd) who had calibrated the pipette but had missed providing the certificate of calibration.

1.8. Thermometer Calibration

At the time of the audit, records were not available for two thermometers, one used to monitor 20°C freezer and one for the incubator (37°C).

All thermometers used in the lab were re-calibrated at the used temperatures and certificates of calibration obtained.

Figure 1. Service: Samples



ULTRA freezer used for sample storage for a period of time

Biorepository Laboratory

This laboratory Sieves, Processes and Stores. The Lab has new equipment procured under the projects. Some of these equipment stress things like whole blood, plasma, urine, swabs, saliva, PBNIC, DNA, plant sample, tissues.



Biorepository Laboratory Supporting Research



Microscope for magnifying micro organisms

MAKBRC NEWS



Prof. Moses Joloba recognized by CDC Global for his effort to fight Tuberculosis in the Africa year 2022

Prof. Moses Joloba was recognized by CDC global for his effort to fight tuberculosis in Africa in the year 2022. Prof. Moses Joloba, Director of Uganda's Nat'l. TB Reference Laboratory, has built capacity for #TB diagnosis & surveillance for 25+ years. His leadership was vital in the GeneXpert platform expansion, which helps diagnose drug-resistant TB.



Dr. Misaki Wayengera

Dr. Wayengera successfully developed a rapid diagnostic kit for Ebola. We are sure, under his leadership, Uganda had a response to COVID19 that is effective and efficient. He also came up with a Solution name: Pan-Filovirus Rapid Diagnostic Test

Ebolavirus and Marburgvirus cause rare but fatal viral haemorrhagic fevers (VHFs) in remote villages of equatorial Africa. Both filovirus VHFs are highly infectious with potential for urban, regional and global spread. Early detection is important for VHFs epidemic prevention and control. Whereas two rapid diagnostic tests (RDTs) have emerged on the scene for Zaire ebolavirus (EBOV), RDTs for other Ebolavirus species that cause VHFs in humans, such as Sudan ebolavirus-SUDV, Bundibugyo ebolavirus-BDBV, Tai Forest ebolavirus-TAFV and Marburgvirus-MARV are missing. Given the similarity of symptomatology among VHFs and other infectious diseases, it is clear that RDTs to combat filovirus VHFs are needed.



CAGE TB (News)

An open-source public data base for all cough TB recordings were for future researchers and the public to utilise and develop more tools that can address the TB burden through cough sounds

SCIENCE WEEK





SCIENCE WEEK

Dr. Monica Musenero, the Minister of Science, Technology and innovation, landed the 2022, National Science Week (NSW), a Ugandan annual show case of technology and innovation. The aim of the exhibition was to document progress made through technological advancement for national development. Dr. Musenero explained, that the exhibition was to offer a platform for entrepreneurs to showcase innovations and new technologies in sectors that are building

the country's development goals and eradicating poverty.

MakBRC staff participated in the science week exhibition that were conducted at Kololo Air Strip and showcased innovations and technologies. Makerere University Biomedical Research Center (MAKBRC) is among the key stakeholders contributing to science-led economy, leveraging innovations in vaccines, therapeutics, diagnostics in Uganda.

School of Biomedical Sciences participate in Science Week.



Prof. Barnabus Nawangwe (VC) at the pre-conference for the Science Week, 2022



Hon. Dr. Monica Musenero Masanza at the launch of the Science Week, 2022



Hon. Dr. Monica Musenero Masanza with Hon. Jesca Alupo (VP) at the launch of the Science Week, 2022



Hon. Jesca Alupo (VP) with Hon. Dr. Monica Musenero Masanza at the launch of the Science Week, 2022



MakBRC staff participating in the Science Week, 2022



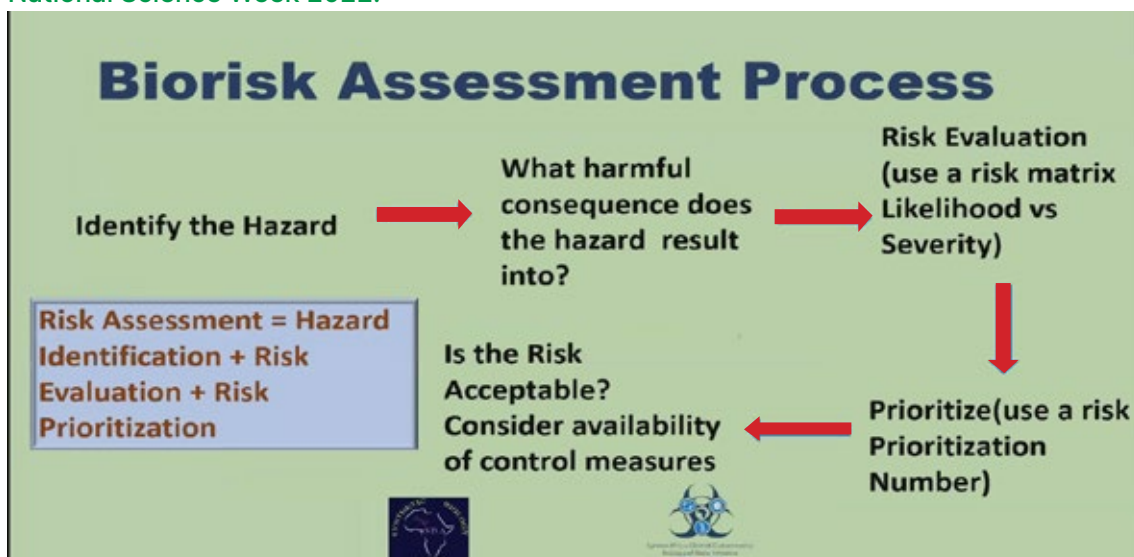
MakBRC staff participating in the Science Week, 2022



Dignitaries at the Science Week, 2022

- The National Exhibition Week for Science provides us with a platform to showcase innovations and technologies across all sectors that are steering us towards achieving the national development goals and fighting poverty. MakBRC as its mandate showcased their innovations, contributions and research outputs re-aligning to the Uganda's Vision 2040 of sustainable development goals of improving health across the globe.

National Science Week 2022.



Day three of SBA-GCBRI for Eastern Africa has started with a presentation from @OkeaMichaelof @MakBRC on Risk Assessment and Mitigation #sbagcbri #gcbri #biosecurity #biosafety.

Research and Innovations at MakBRC





Nitrogen tank

Sample
Storages are
kept in these
equipment

Students (Masters and Phd) making use of samples stored and also the Bio repository help students to store their research samples in the repository. Both undergraduate and graduate students make use of the stored samples for their research.

The Unit also collaborates with international and National researchers in various projects.

The unit also received an international trainee from Ethiopia and they were recently trained in Biorepository.

They also presented the Faculty in International conferences and meetings (H3Africa, ISBER, e.t,c



Integrated Biorepository IBRH3AU (Freezer Farm)



COV-BANK SUPPORT TO RESEARCH (Ultra Freezer for storage of samples)

Bioinformatics/Computational

- 256 Cores, 40TB servers for Analysis
- eBiolit Training resources (over 100 clients)
- 15 iMac and MacBook Workstations
- Hosted 4 workshops with over 200 students from all over Africa.
- Bioinformatics pipelines for metagenomics, small-genome assembly, mapping and variant calling.



Server

```
130 HOSTS=( echo $HOSTDATA | wc -w | / 2 )
131 NUMS=( echo $HOSTDATA | cut -d' ' -f -1 | tr -d '\n' | fold -w 1 | tr -d '\n' | wc -l )
132 [ "$HOSTS" -a "$NUMS" ] || die "Cannot determine hostlist for archives"
133 [ "$CHK_COMP" ] || die "Invalid or missing input for compression type"
134 CNT=0
135 for HOST in ${HOSTS[@]}; do
136   egrep -q "^$HOST[ ]" $DIRPC_HOSTS || ERROR="$HOST not found"
137   FILES="$FILES $HOST.$NUMS[$CNT].tar$COMP"
138   CNT=$(( CNT + 1 ))
139 done
140 echo $COMP | grep -q ".bz2" 66 COMP_OPT=1
141 echo $COMP | grep -q ".gz" 66 COMP_OPT=2
142 [ "$COMP" = "tar" ] || die "Archive hosts do not exist - $HOSTS"
143 [ "$COMP" = "tar" ] || die "create archive file list"
```

Computational Infrastructure



Immunology Laboratory



Luminex Machine (Used for measuring multiple analytes in a single sample)

Pharmacology Laboratories



Cytoflex Flow-Cytometer



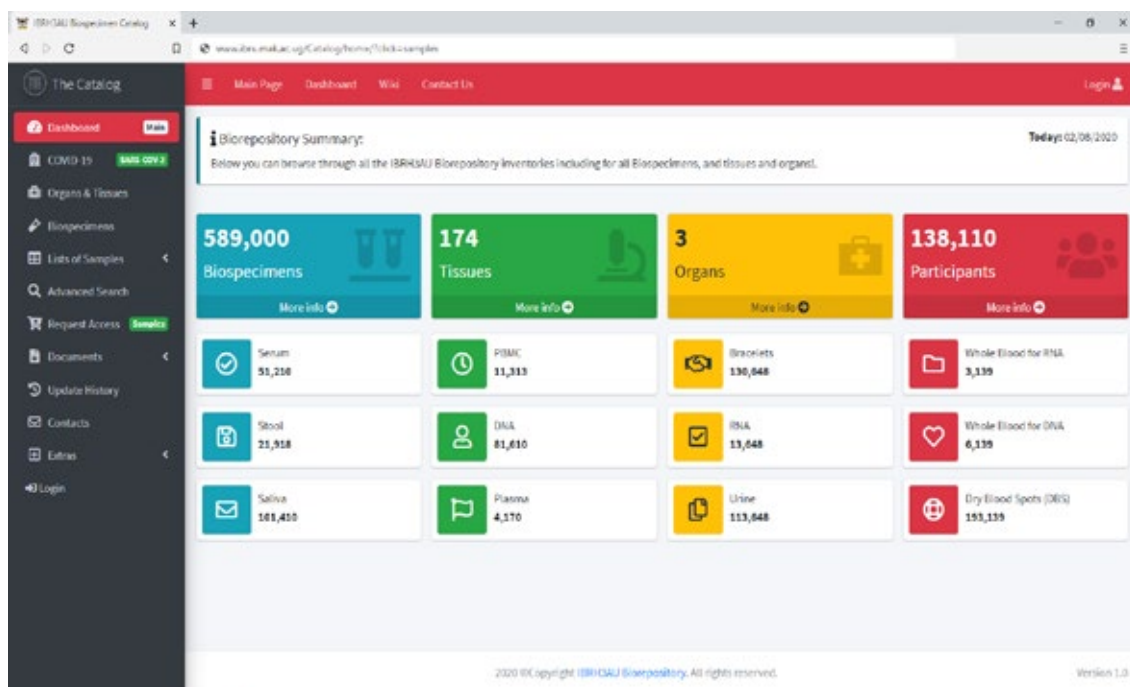
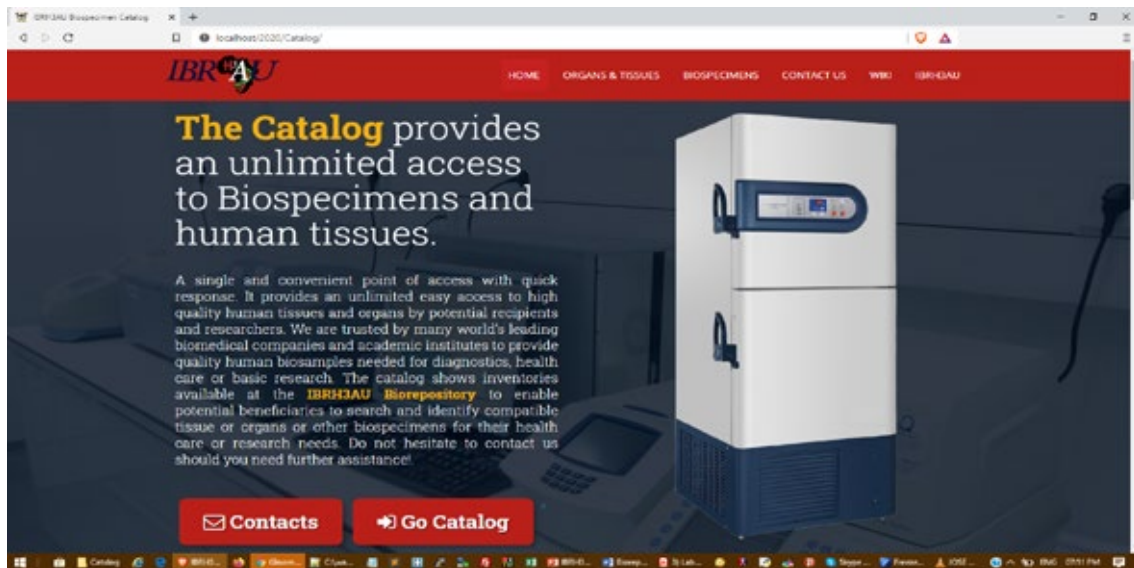
HPLC technologies (high performance liquid chromatography)



ULTRA freezers for storing / archiving samples for along period of time.

Functional Tissue Catalog

<https://www.ibru.mak.ac.ug/Catalog>





The Republic of Uganda
MINISTRY OF HEALTH

NEW

Accredited Laboratories to carry out COVID-19 testing in Uganda:

1. Uganda Virus Research Institute (UVRI)
2. Central Public Health Laboratory (CPHL)
3. Infectious Disease Institute (IDI) Laboratory
4. Makerere University
5. Mild May Laboratory
6. Tororo Mobile laboratory
7. Mutukula Mobile laboratory
8. Adjumani Mobile laboratory
9. Joint Clinical Research Center (JCRC)
10. MBN Laboratory
11. Medipal International Hospital
12. Test and Fly Laboratory
13. Uganda Cancer Institute, Fred Hutchison Laboratory
14. IOM Laboratory

Reinter mediate back-end ideas for cross platform models, continually, reinter mediate integrated process through technically sound intellectual Capital.

SUPPORT IN SERVICE DELIVERY



2.2. Site visit by the College Quality Assurance & Gender Committee



Figure.5. On left MS. Irene Rebecca Namatende (CHS-QA officer) Prof William Buwembo (Head of Anatomy department), Haruna Muwoge (DPT of Physiology), Dr. Onyango Jude (Family Medicine), Dr. Khalid Rajabu (Pharmacy), Racheal Mirembe (Sen. Administrative Officer on 13th June 2022



Quality Assurance and Gender committee visiting School of Biomedical Sciences



Quality Assurance and Gender committee visiting MakBRC Laboratories

The Makerere University, College of Health Sciences (MakCHS), Quality Assurance and Gender Committee conducted monitoring and evaluation site visits to various departments and concluded their visit on 5th July 2022.

The Departments visited were; Anatomy, Immunology and Molecular Biology, Pathology, Microbiology, Physiology, Genomics and Bioinformatics Laboratories.

The objective of the visits was to monitor the status and performance of schools and departments under School of Biomedical Sciences. The Committee conducted an asset mapping on the facilities and support systems for teaching and learning. This visit also aimed at getting feedback that could inform management on the status of the departments and therefore

this feedback could guide on key interventions and decisions in regard to teaching and learning.

The committee devised a checklist as a tool used to collect data and some of the indicators on the checklist were; Strategic Plan, staffing, No. of PhD, graduates teaching facility, equipment, office space, No. of graduates students, collaborations, promotion of staff, innovations, partnerships, and collaborations. The committee visited the department of Immunology and Molecular Biology. The findings for this visit affirmed that MakBRC is doing well in supporting research science and innovations at the college of Health Sciences.



Figure.6. The Quality Assurance & Gender Team received by Dr. Obondo James at the Department of immunology and molecular Biology



Figure.7. State of the art equipment at immunology & molecular Biology



Figure.7. More equipment at MakBRC

Community Service

- MakBRC has Improved the health care of Ugandans, Africa and beyond
- Participated in community sensitization efforts including the following:
 - Science week
 - JASH conference
 - Cytotechnology conference
 - Pathology dinner
 - USHS conference
 - UMA General meeting
- Supported review of AMR curriculum supported by USAID

On 7th November 2022, during the launch of the public lecture and gowning ceremony, it was evident that the power and science of vaccines was recognized as the best innovation to improve the health system and promote health across the globe.



MakBRC has always worked hand in hand with the team in the University Hospital.



The team from MakBRC offering free testing to the students at Makerere University Hospital.

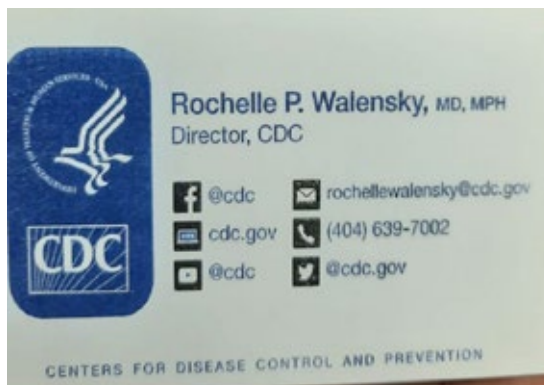
COLLABORATION AND PARTNERSHIP



International Networks and Recognitions



Dr. Misaki Wanyengera at the WHO summit in Berlin



On left is Dr. Kalyesubula and other participants in Berlin



On left the Vice-Chancellor, Prof. Barnabas Nawangwe with Dr. Seth Franklin Berkerly

The Visit of the Deputy Director Fogarty International Centre.



Left Dr Emmanuel Nasinghe, Prof. Moses Joloba, Dr. Willy Ssengooba, Dr. Peter H. Kilmarx, Dr. David Kateete

The Deputy Director Fogarty International Centre with the Staff MakBRC.



A masters Student on left explaining to Dr. Peter H. Kilmarx (on left) how the Sequencer works in Molecular and Genomics

The Deputy Director Fogarty International Centre toured the Makerere University H3Africa Biorepository and Genomics Facility managed by Makerere University Biomedical Research Centre (MakBRC).

IBRH3AU BIOREPOSITORY

IBRH3AU Biorepository is an integrated laboratory under the H3Africa located at Makerere University College of Health Sciences (MakCHS) a centre of Academic Excellence, Health Care and collaborative research.

IBRH3AU provides a resource of well characterised and annotated quality biospecimens to be used by future studies. This resource is utilised by communicable and non-communicable disease researchers in an african population.



IBRH3AU Biorepository

The Biorepository has MOUs and collaborations with the following Researchers and Institutions.

S.N	H3AFRICA Biorepositories in Nigeria and South Africa through the NIH (National Institute of Health)
2.	Neuro-GAP project
3.	TB-SPEED project
4.	The African Severe Asthma Project
5.	Uganda Christian University
6.	Child and Family Foundation, Uganda
7.	East African Geohealth HUB
8.	Uganda Heart Institute
9.	Oregon Health & Science University Portland, Oregon
10.	Makerere University Centre for Health and Population Research (MUCHAP)
11.	AFRICA SUITCASELAB
12.	Global Health Uganda

Framework contracts and service agreements with government of Uganda ministries/ authorities

In line with its objectives, MakBRC entered framework contracts with many government agencies in support of service delivery. Below are the agencies among others

New Strategic Projects last year

- Uganda Revenue Authority (URA)
- Uganda Parliament
- Federation of Uganda Football Association
- National Information Technology Authority (NITA)
- National Water and Sewerage Corporation
- Uganda World Life Authority
- Uganda Heart Institute etc

New Projects in 2022

FEND for TB	Evaluating Novel diagnostics in TB among adult index cases.	Rutgers, The State University of New Jersey
NODpedFEND	Evaluating Novel diagnostics in TB among index cases in children below 5 years. .	Rutgers, The State University of New Jersey
Halting-TB	Evaluating host pathogen	Rutgers, The State University of New Jersey
TB immune responses	Evaluating response to TB	Massachusetts General Hospital
COVID-19 Biobank	Building a repository of COVID-19 bio specimens to support research in Uganda	Government of Uganda

FINANCE AND STRATEGIC PLANNING



DEPARTMENT OF FINANCE & STRATEGIC PLANNING



Mr. Ssekyango Kanya Rogers Head of Finance & Strategy

Department Goal: To make MakBRC financially viable and keep track of its objectives of establishment

Department Objectives:

- To set and manage the strategic direction of MakBRC
- To provide the best platform for acquisition and management of external funds and activities
- To accurately prepare and analyze MakBRC financials
- To oversee all the unrestricted revenue avenues of MakBRC
- To assist MakBRC stakeholders acquire the right goods and services at the right time and at the right price

Internal Control Functions

- Risk analysis, monitoring and mitigation
- Assist in the development and review of MakBRC policies and procedures
- Reviews the budget line items charged
- Reviews posted financial data
- Perform Monitoring & Evaluation activities via participating in the development of M&E Plan plus designing of monitoring tools and

data collection tools and review the reports submitted by underlying officers

Capacity Building Functions

- Train and provide ongoing technical assistance to underlying staff
- To review training materials and program for trainings to be provided by underlying unit managers
- Directing and controlling underlying staff to ensure their full motivation

Finance Management Functions

- Leading the budgeting, forecasting and planning processes
- Develop and implement a robust financial process and controls
- Assist in periodic external audits and financial review processes
- Managing of institutional statutory duties compliance
- Perform periodic financial analysis to guide decision making
- Layout strategies to control and monitor expenditures
- Controlling all financial and accountancy matters including month end reports, management accounts, cash flow management, statutory accounts, presentation of management information and Key Performance Indicators

External Funds Management Functions

- Assist in grant application process
- Assist in drafting and review of projects/ grants Memorandum of Understanding/Sub award/corporate agreement/partnership agreement
- Indirect cost monitoring and allocation

Procurement & Stores Management Functions

- Develop a strategic approach to MakBRC's procurement and material management process
- Analyze MakBRC inventory to guide in decision making
- Monitor external contracts and services

Business Development Functions

- Develop and manage a sustainable and profitable business model for MakBRC
- Analyze and monitor debtors
- Recommending funding sources for investment and calculate the likely return on investment

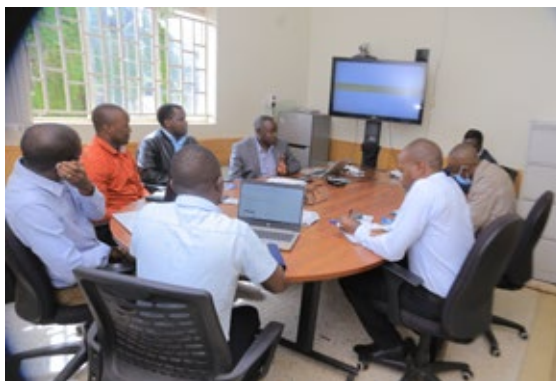
- Oversee business relationships with partners
- Diversify MakBRC revenue portfolios
- Oversee the operationalization of the innovations hub

Strategic Functions

- Strategic plan development, monitoring and evaluation
- Conduct stakeholders engagement, analysis and monitoring
- Perform root cause analysis of potential problems and provide effective resolutions
- Recommend business improvements based on market and competitive trends

Supervisory Functions

- Perform daily supervision of underlying staff
- Set and monitor targets for the underlying staff
- Participate in the hiring of underlying staff
- Participate in performance appraisal of underlying staff



MakBRC Finance Strategic Team

STATEMENT OF FINANCIAL POSITION

AS AT 30 JUNE 2022

		2022	2021	2022	2021
		UGX.	UGX.	US\$	US\$
CURRENT ASSETS	Notes				
Receivables and prepayments	11.8	9,404,934,584	3,190,681,069	2,506,841	902,296
Bank & cash balances	11.9	8,934,229,656	6,763,463,657	2,376,550	1,912,440
TOTAL ASSETS		18,339,164,240	9,954,144,726	4,883,391	2,814,736
FUNDS AND LIABILITIES					
Funds					
Restricted funds		16,040,780,535	9,278,416,502	2,319,771	2,623,853
General fund		258,050,046	30,739,601	2,020,131	8,486
Total funds		16,298,830,581	9,309,156,103	4,339,902	2,632,339
Current Liabilities					
Payables & Accruals	11.10	66,500,000	644,988,623	18,440	182,397
Deferred income	11.11	1,973,833,659	-	525,049	-
Total Current Liabilities		2,040,333,659	644,988,623	543,489	182,397
TOTAL FUNDS AND LIABILITIES		18,339,164,240	9,954,144,726	4,883,391	2,814,736

The financial statements were approved by the Board of Directors on2022 and signed on behalf by:

.....
DIRECTOR

.....
DIRECTOR

The notes on pages 19 to 23 form an integral part of the financial statements.

The report of the Independent Auditor is on pages 6 to 9

MaK-BRC

Board Members



Assoc. Prof. William Buwembo,
Chairperson MaKBRC
Head of Department Anatomy



Prof. Umar Kakumba
Board Member
Deputy Vice Chancellor Academic Affairs -
Makerere University



Prof. Moses Joloba
Ag. Managing Director, MaKBRC
Dean, School of Biomedical Sciences



Dr. Robert Kalyesubula
Board Member /
Head Physiology Department



Dr. Hawa Nalwoga
Board Member /
Chair Pathology



Dr. David Kateete
Board Member
Chair Immunology & Molecular
Biology



Assoc Prof. Benon Asimwe
Board Member
Chair Microbiology



Dr. Jackson Mukonzo,
Board Member /
Chair Pharmacology & Therapeutics



Mr. Lukiza Paul,
Board Member /
Chair Medical Illustration



Dr. Steven Mpungu Kiwuwa
Board Member /
Chair Biochemistry



Dr. Robert Ssekitoleko
Board Member /
Biomedical Engineering Unit



4.4. Next year's plan 2023

- Over two million samples.
- Establish a centralised LIMS for all Labs.
- Establish a Clinical Research Unit.
- Establish an Innovation Hub to translate R and D ideas to commercialisation.
- Obtain space for expansion.
- Set up an innovations hub to nurture young innovators.
- To commercialise all tested and proven products.

Mission



Delivering proven innovative and effective knowledge and technologies for use in health care.

Vision



To be a global leader in developing knowledge, treatments and technology for use in health care.

Core Values

- ❖ **Innovation:** we are constantly looking for ways to innovate and improve.
- ❖ **Caring:** we care about our donors, partners, staff, communities and each friend we serve.
- ❖ **Excellence:** we strive for excellence in whatever we do.
- ❖ **Accountability:** we accept our responsibilities and try hard to achieve those things for which we are accountable.
- ❖ **Integrity:** we are truthful, fair and honest in all interactions.
- ❖ **Teamwork:** We support each other to achieve our set objectives.
- ❖ **Professionalism:** Throughout our work, we demonstrate competence and capacity to generate results to the expected institutional, national, international and discipline specific standards.
- ❖ **Respect:** We ensure acknowledgment, attention and good judgment in dealing with all stakeholders.
- ❖ **Diversity:** We are an equal opportunity institution that embraces diversity in order.

Mission

Vision

Core Values

Publications

- Acen, E. L., Biraro, I. A., Bbuye, M., Kateete, D. P., Joloba, M. L., & Worodria, W. (2022). Hypovitaminosis D among newly diagnosed pulmonary TB patients and their household contacts in Uganda. *Scientific Reports*, **12**(1), 1–8. <https://doi.org/10.1038/s41598-022-09375-7>
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