

Mount Kenya



University



2023 RESEARCH & INNOVATION BULLETIN

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INTRODUCTION

Mount Kenya University recognizes the role played by research and innovation in transforming communities, national development, and sustainable use of natural resources. The university also recognizes that ground breaking research and innovation is only feasible in an ambient environment that allows free and inquisitive, and innovative curiosity. The university fully supports the attainment of the global sustainable development goals and continues to actively play its role at it contributes to this goal. In 2023, the university continued its function as a hub for research and development as it offered a platform for its faculty and collaborators to carry out groundbreaking research and innovation. The university availed research laboratories and other facilities to the members of the university fraternity, collaborators and the community for experimentation, discourse, and dissemination.

The University has established a robust postdoctoral research program that offers a platform for graduating doctoral fellows to apply their skills. This platform is meant to encourage retention of talented and well-educated young scientists interested in academia and research. The development of the program was informed by the need for an environment that allows young scientists to explore and realize their full academic potential while at the same time stemming brain drain, a challenge faced by many developing economies where opportunities are limited. The current postdoctoral fellows have won early investigator grants from various funding agencies The European and Developing Countries Clinical Trials (**EDCTP**), The Royal Society, National Institutes of Health among others.

The launch of the Centre for Malaria Elimination highlighted the universities commitment the attainment of **SDG 3** that commits to Good Health and Wellbeing. The malaria research ventures into under-researched aspects of the disease including placental malaria, that is a major contributor of neonatal deaths, low birth weight and maternal ill health. The aim is to develop tools to aid diagnosis of placental malaria during pregnancy to prevent its deleterious effects on the health of the mother and child. The University continued to contribute significantly to the fight against antimicrobial resistance by engaging relevant stakeholders to improve antimicrobial stewardship and reduce resistance. Other faculty members focused on studies that aimed at understanding the biology of breast tumors in Kenyan women. This group was able to demonstrate the existence of differences in genetic drivers of breast cancer between Kenyan women and their European and African American counterparts. A gene called **ARID1A** was identified to be highly mutated in Kenyan women but not in their American counterparts.

The University continued to attract local and international collaborations and partnerships to propel its research and innovation agenda. Some key collaborators include the National Institutes of Health (**USA**), National Cancer Institute (**USA**), University of Leipzig (**Germany**), University of Ibadan (**Nigeria**), University of Tunis (**Tunisia**), INES-Ruengeri (**Rwanda**), KNUST (**Ghana**), and IGRIB (**Benin**), The University of Ss. Cyril Methodius inTrnava (**Slovakia**). Cognizant of the need of a mechanism to catalyze research, innovation and dissemination of results, the university, through the Vice Chancellor's Research and Innovation Grant (**simply referred to as VC-Grant**) awarded research seed grant to eighteen (18) faculty members, supported forty (40) faulty members to disseminate their study findings through publication in peer reviewed journals, conferences, and workshops.

The VC-grant also supported hosting of the Research, Innovation and Digital Agriculture week that attracted innovators, researchers, and industry players to display their research findings. This even showcased cutting edge innovations with the winning innovation now competing on a global scale, a display of research posters and exhibitions by industrial players.

FOREWARD

The AU Agenda 2063 and National Commission for Science Technology and Innovation (**NACOSTI**) provides a basis for higher education to participate in impact-based research activities. Further, the Commission for University Education stipulates the participation of academic staff in research activities as part of their workload.

NACOSTI in its 2023-2028 strategic plan (draft) and KeNIA's (2023-2027) strategic plan provides for the promotion of collaboration and partnerships for research and technology development, institutionalization of intellectual property policies in universities and research institutions. Similarly, the STI policy 2020-2030 promotes collaboration and partnerships among institutions, and commercialization of research innovations in responding to Kenya's national and global needs.

Mount Kenya University's Research Policy (**URP**) provides the guidelines and framework for research priorities and focus in responding to socio-economic challenges, solving society problems, informing policy and contributing to knowledge generation. Mount Kenya University has put in place support mechanisms to support research activities, output and impact for staff, in 2024 to address more impact-based research outputs and community service.

As such, the college of graduate studies has developed a 2024 roadmap and revised the Vice Chancellor's Research and Innovation grant guidelines to open up more opportunities for research, publication, community service, innovation and dissemination for the year 2024 and beyond. This was informed by the increased financial support to the VC's grant to KES. 30 million for 2024. The fund will support school-based research projects to the tune of KES. 1.8million in all the 13 schools. This is in addition to supporting one publication in peerreviewed and indexed journal/book chapter, support for local and international conferences, campus or ODeL centres research workshops and resource persons facilitation.

As you read this bulletin, we continue reaching out to more synergetic partners, stakeholders and students to join us on this exciting journey of exploration and discovery. Together, we can shape the future of our society through the power of research and innovation.

Dr. Henry Yatich, Ph.D

Principal, College of Graduate Studies and Research

Message from the Vice-Chancellor



Prof. Deogratius Jaganyi

*Vice Chancellor,
Mount Kenya University*

The United Nations recognizes the pivotal role of research and innovation in fostering human development. Sustainable Development Goal (SDG) 9, focusing on Industry, Innovation & Infrastructure, underscores the imperative of increased investment in research and innovation to bolster technological capabilities and enhance access to information and communication. This goal underscores the significance of research and innovation as fundamental drivers of socioeconomic progress, thereby elevating the human development index. Equally, SDG 3 (Good Health & Wellbeing) and SDG 4 (Quality Education) stress the critical role of research and innovation in meeting their respective objectives.

On a national level, Kenya Vision 2030 acknowledges the paramount importance of research in bolstering competitiveness, propelling industrialization, advancing education and skills development, and ensuring the sustainable stewardship of Kenya's natural resources. Furthermore, Kenya's Science, Technology, and Innovation (STI) policy aspires to expedite the transition to a knowledge-based economy.

Mount Kenya University's strategic blueprint recognizes research as a cornerstone for socioeconomic advancement. The University remains committed to enhancing research and innovation outcomes through initiatives such as the Vice-Chancellor's Research & Innovation grant, which supports faculty and students in their research pursuits. The University actively cultivates strategic partnerships and collaborations, resulting in the establishment of cutting-edge laboratories and groundbreaking research breakthroughs.

These endeavors have been instrumental in elevating the University's standing in web rankings and garnering recognition for its research and innovation contributions globally.

The University's postdoctoral fellowship program continues to flourish, attracting talented postdoctoral fellows and providing them with a platform to conduct pioneering research. The University reaffirms its dedication to supporting faculty, students, and the wider community in elevating the country's quality of life through research and innovation. As you peruse the highlights of the research endeavors detailed in this bulletin, it is my fervent aspiration that we will persist in harnessing our intellectual capacities through research and innovation to elevate the country's human development index and provided impactful research outputs.

Message from the Deputy Vice-Chancellor, Academic and Research Affairs



**Dr. Mercyline Kamande,
Ph.D**
*Deputy Vice-Chancellor,
Academic and Research
Affairs*

Research remains as the core-activity of modern day higher education institutions. At Mount Kenya University, we have put in place robust mechanisms to ensure that, all staff and students at all levels participate and are supported in their research endeavours. To this, we have set up a series of monthly capacity building seminars, set targets for each academic staff and established a monitoring system that checks on the efforts of each staff, school and campus on a semester basis. As the academic division, we are happy to present the first edition of our university research bulletin 2023, dedicated to highlighting and celebrating the vibrant research and innovation activities, that have happened in 2023.

I wish to underscore the fact that research at Mount Kenya University is not just about the pursuit of knowledge; it is about passion that drives us to push the boundaries of knowledge and make a meaningful difference in Kenya and to the world. Our researchers are at the forefront of addressing some of the society's most pressing challenges and shaping the future thus promoting sustainable development agenda.

In this bulletin, you will find an array of research highlights spanning various disciplines, from the sciences to the humanities, engineering and arts. Whether it is advancing medical breakthroughs, pioneering sustainable technologies, or illuminating the complexities of human culture and society, our researchers are making significant contributions that resonate with the National Research Agenda, AU Agenda 2063 and Kenya's Vision 2030.

As a contributor to research space in Kenya, I wish to make key observations that research is a collaborative spirit, the intellectual curiosity, and the relentless pursuit of excellence that define our scholarly community. It is on these premises that the university in 2024, has set forth a research agenda for the university, set research targets for each staff, schools and campuses. We have also put in place mechanisms to support these initiatives through the Vice-Chancellor's Research and Innovation Grant (ViCRIG), which currently has an allocated fund of KES. 30,000,000. With this, we remain committed to fostering an environment where research flourishes, curiosity is nurtured, and the pursuit of knowledge is enhanced. Together, we will continue to push the frontiers of discovery, inspire the next generation of scholars, and make a lasting impact on our world.

A. Varsity Awards Research Seed Grants to 18 Faculty Teams

Mount Kenya University has prioritized investment in research that is geared towards improving health outcomes, safe environment, and climate change resilience. Through the VC-grant, the university competitively awarded eighteen teams from eight schools at a funding rate of 78%. The table below summarizes the number of proposals submitted and funded per school.

S/NO.	SCHOOL	PROPOSALS SUBMITTED	FUNDED
1.	Medical	3	3
2.	Public Health	5	4
3.	Nursing	1	1
4.	SPAS	2	1
5.	Social Sciences	4	4
6.	Education	1	1
7.	Business & Economics	5	2
8.	Computing and Informatics	2	2
TOTAL		23	18

The funded projects as described below:

1. Enhancing smallholder farmers' income and food security through management of *Tuta absoluta* in tomatoes



PROJECT TEAM

Dr. Allan Mweke (PhD), **Principal Investigator**

Co-Investigators: Dr. Elizabeth Mwaura (PhD), Dr. Emily Nyabisi (PhD), Dr. Ruth Winnie Munene (PhD) & Dr. Ruth Njoroge (PhD)

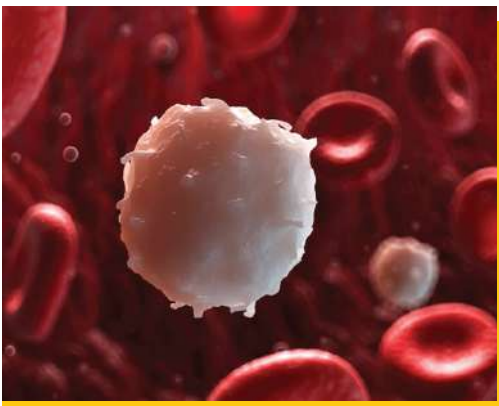
Project Summary

Tomatoes crop is a major source of income for the smallholder farmers leading to improved livelihood and ultimately to community development in the rural areas.

Smallholder tomato farming in Kenya is dominated by older men and seven out of ten tomato growers are male. The tomato leaf miner, *Tuta absoluta* is a small but highly destructive pest that affects mainly tomatoes, and other Solanaceous plants such as potatoes, egg plants, capsicums etc. Currently *T. absoluta* is the major limiting factor

in tomato production, in Kenya. Infestation of *T. absoluta* can result in 100% tomato yield losses in absence of control measures. Even though chemical control is the most popular strategy employed by farmers, it has negative effects on food safety and health, environment and non-target beneficial organisms besides development of resistance by the pest rendering chemical control ineffective. There is, therefore, need to develop a more sustainable, environment friendly, and cost-effective control strategy for *T. absoluta* that will reduce cost of crop protection, reduce food safety risks associated with synthetic pesticides and increase tomato yield; thereby enhancing small holder farmer's income and food security. The goal of this project is to develop a strategy or strategies that are more sustainable environmentally and pose less or no risk at all to humans and non-target beneficial organisms. The proposed strategy once adopted will not only lead to reduced cost of production for the majority resource constrained small-holder farmers but will also increase productivity leading to more income for the farmers and ultimately lead to community development through uplifting of most tomato producers throughout the country. The study will also investigate costs and benefits associated with adoption of various management strategies of *T. absoluta* in tomatoes in monetary terms and identify the most cost effective and economical strategies based on general information and responses by farmers.

2. Levels of Haematological and Immunological Parameters in HIV Infected Patients on Antiretroviral Therapy Attending Thika Level Five Hospital Comprehensive Care Center, Kiambu County



PROJECT TEAM

Esther Wangui Mandania (MSc.), **Principal Investigator**
Co-Investigators: Dr. Suliman Essuman (PHD) and
Dr. Stanley Waithaka (PHD)

Project Summary

Human Immunodeficiency Virus (HIV) remains a global issue that causes considerable morbidity and mortality all over the world, particularly in sub-Saharan Africa, where greater than 70% of all HIV patients exist. HIV is a multisystem disease and haematological and immunological abnormalities have been reported as among the most frequent complications of HIV infected patients. Haematological abnormalities involve all the three major cell lineages leading to impaired haematopoiesis and cytopenias. The levels of haematological and immunological parameters of HIV-infected patients on antiretroviral therapy attending Thika Level Five Hospital CCC in Kiambu County remain to be established. Therefore, this study seeks to determine the levels of haematological and immunological parameters in a cohort of HIV infected patients receiving ART treatment in Thika Level 5 Hospital Comprehensive Care Clinic in Kiambu County. The sociodemographic information and clinical history data will be gathered using structured questionnaires and from health records. Blood samples will be collected from HIV- infected patients and from healthy blood donors (control group) for analysis of complete blood cell count (CBC). Statistical analyses will be performed using STATA v 13 at a significant level of *P* value of <0.05.

3. Antimalarial Drug Prescription: Evaluation of WHO guidelines for Prescription of Artemisinin based Combination Therapies (ACTs)-A case study in Kilifi County



PROJECT TEAM

Dr Ngala Chome Jonathan (PhD), *Principal Investigator*

Co-Investigators: Dr. Epaphrodite Twahirwa (PhD) and Dr. Paul Sifuna (PhD).

Project Summary

Malaria is a vector borne disease caused by a protozoan parasite in the genus Plasmodium. The parasite is transmitted by female mosquitoes in the genus Anopheles. The disease is common within the tropics of the world especially in sub-Saharan Africa. The major early clinical features of the infection are fever accompanied by headache, joint pains, malaise, vomiting and diarrhoea. In most health facilities, these symptoms are used as a diagnosis for malaria infection without confirmatory laboratory tests. This is followed by prescription of first line antimalarials, mainly Artemisinin-based combination therapies (ACTs). This trend of prescribing antimalarials to patients presenting with malaria-like symptoms without confirmatory laboratory tests in our health facilities is contrary to the World Health Organisation recommended guidelines. Such practices pose a great risk for suboptimal medication, development of resistance against the drugs, treatment failure and increased morbidity and mortality. For this concern, a cross-sectional study is underway to evaluate adherence to the WHO recommended guidelines for prescription of ACTs in four health facilities in Kilifi County. Candidates include outpatients who consent for recruitment in this study. Pre and post-ACTs prescription data is captured using standardized case record form before analysis. Research findings emanating from this study will give us knowledge on whether health facilities in Kilifi County, a malaria endemic region, adhere to the WHO recommended guidelines for prescription of ACTs. This knowledge will also inform on the need for assessment of resistance against ACTs in the County, Country, continent and the world at large.

4. Impact Assessment on Use of the Orbit Reader 20, a Digital Braille Assistive Device, on Inclusivity of Learners with Visual Impairment in Kenya: A pilot study



PROJECT TEAM

Dr Joyce Gikandi (PhD), *Principal Investigator*

Co-Investigators: Dr Serah Kimaru (PhD), Dr Judy Mwangi (PhD) and Dr Mary Mugwe (PhD).

Project Summary

The current research project is a pilot study that focuses on assessment of the impact of the Orbit Reader 20 and its influence on access to quality education with particular focus on inclusivity for learners with visual impairment (VI) in special, integrated, and fully mainstream basic and higher education provision in Kenya. The study will adopt a mixed methodology approach. The project will employ a descriptive survey design. To provide a framework for systematic scientific research, a descriptive survey design will be adopted to assess the impact of intervention in relation to the use of digital braille for learners with VI. The approach will employ both qualitative and quantitative techniques in data collection and analysis to provide for depth and breadth of information. Within the mixed techniques approach, a convergent parallel model will be employed. The OR20 pilot impact study will be restricted within 3 institutions in Kenya, with a possibility of scalability to other counties and nations within which KBTA implements its program. The study is expected to take 6 months. The key objective of the current study is to assess the impact of the Orbit Reader 20 and its influence on inclusivity in education for learners with visual impairment (VI) in special, integrated, and fully mainstream education institutions in Kenya.

5. Supporting Breastfeeding in the workplace: A qualitative study of employers perceptions.



PROJECT TEAM

Ms. Leah Mututho, *Principal Investigator*

Co-Investigators: Dr. Willy Kiboi (PhD), Mr. Patrick Mucheru and Dr. Joseph Muchiri.

Project Summary

The importance of breastfeeding is known, positively impacting the health and wellbeing of children, mothers, families and the larger communities and populations they comprise. Breastfeeding has been consistently shown to be protective against a range of immediate and longer term health outcomes that are a significant burden on individuals, the health system and society. Globally, about 41% of all babies are breastfed exclusively for six months and only 45% continue to breastfeed up to two years. In Kenya breastfeed ingrates are below World Health Organization's recommendations despite the benefits of breastfeeding to an individual and society at large being substantially documented. Return to work has been identified as a major barrier to exclusive and continued breastfeeding. It is thus critical for employers to establish breastfeeding friendly work environments to support breastfeeding mothers as they return to work. This study aims at determining the employers' perceptions towards the establishment of breastfeeding friendly work environment. This will be an Analytical Phenomenology Qualitative study conducted in Kiambu County among purposively sampled employers and personnel from public and private organizations with established working places. Data will be collected through in depth interviews while observing Covid-19 guidelines. The interviews of this study will be digitally recorded and transcribed verbatim then analysed using ATLAS.ti version 7 qualitative software. Ethical clearance will be sought from Mount Kenya university ethical review committee. Permission to conduct the study will be obtained from National Commission for Science, Technology and Innovation (NACOSTI). The results of the study will form a basis for engaging the stakeholders towards promoting a breastfeeding friendly environment for working mothers.

6. Political Leadership Changes and Completion Rates of Infrastructure Projects Initiated by County Governments of Murang'a and Kiambu Counties , Kenya



PROJECT TEAM

Mr. Humphrey Mwamboo, *Principal Investigator*
Co-Investigators: Dr Samuel Karenga (PhD).

Project Summary

The project seeks to develop an inventory of stalled projects in the counties of Murang'a and Kiambu initiated by the Central government or the county Government since advent of devolution. After developing and inventory of stalled projects, the study will seek to establish any connection between project stalling and political leadership changes. This will inform the policy on infrastructure projects to reduce amount of wastage experienced in the country.

7. Effects of Trachoma Vernacular Radio Messages' and Preventive Behaviour in West Pokot Kenya



PROJECT TEAM

Ms. Faith Ngure, *Principal Investigator*
Co-Investigators: Ms. Jane Wamathu, Dr. Joseph Muchiri (PhD) and Dr. Sarah Kimaru.

Project Summary

Trachoma is the main cause of blindness and records a high population of blind people globally with 1.9 million infections. The infection is caused by intracellular bacterium it is associated with dusty, dry, and hot regions. Marginalized communities weighed down with poverty, poor sanitation levels, and overpopulation are majorly affected. Such communities lack of culturally suitable health promotion and have small workforce. The infections are majorly found in young children and transmitted by eye and nose secretion by flies. Different reinfection episodes causes trichiasis harming the cornea which causes to blindness in older people. Therefore, vernacular radio aid in promotion of health issues due to its simplicity, affordability, and portability. As such, vernacular radio is the most effective in attitude and behaviour change. This study seeks to find out the vernacular radio Messages' consumption of Trachoma and preventive behaviour in West Pokot Kenya. Specific objectives are to investigate the effects of Trachoma vernacular radio messages frames on preventive behaviour in West Pokot Kenya, examine the effects of priming of Trachoma vernacular radio messages on

preventive behaviour in West Pokot Kenya and determine the moderating effects of demographics on the relationship between radio Trachoma vernacular radio messages and preventive behaviour in West Pokot Kenya. Qualitative method will be utilized that will employ descriptive research design to help obtain in-depth information and describe the situation in study. Focus discussion group and key informant interviews will be used in data collection. Data will be coded, analyzed thematically using descriptive statistics and represented using verbatim narrative. The study will benefit West Pokot members, Ministry of Health, Government, media, and health practitioners.

8. Effect of Nutrition Education and Counselling on the nutritional status of alcoholics in Kiambu County, Kenya



PROJECT TEAM

Ms . Kwamboka Evelyn Makori, *Principal Investigator*
Co-Investigators: Dr Juma Nyamai.

Project Summary

Nutrition education and counselling is one of the most effective intervention strategies that can bring about nutritional knowledge, attitude and behavioral change in an individual. The general purpose of this study is to determine the effect of nutrition education and counselling on the nutritional status of alcoholics in Kiambu County.

9. Management of menstrual hygiene waste at household level in Thika sub-county, Kenya



PROJECT TEAM

Ms. Vivian Mwalenga (MPH), *Principal Investigator*
Co-Investigators: Dr. Violet Maritim (PhD) and Ms. Teresia Njoroge.

Project Summary

At least 500 million women and girls worldwide lack access to basic menstrual hygiene management facilities (MHM). Most people from the informal settlements and the rural regions do not have access to safe menstrual hygiene products and waste management facilities. There is still little information on menstrual waste hygiene management that exists in Kenya as most people, especially from the rural areas consider menstrual health as an issue that portrays weakness in

women. The main objective of this study will be to assess the management of menstrual hygiene waste at household level in Thika Sub-county in Kiambu County, Kenya. Data will be collected from all females of reproductive age living in Thika Sub-county on the type of Menstrual Hygiene products they use, how they dispose them in their homes and their knowledge, attitude and practices on the same. A pre-tested online questionnaire with open ended questions will be issued to collect data from the study participants and the Statistical Package of Social Sciences (SPSS) will be used to analyze the data. The specific area of study in Thika Sub-county will be selected through purposive sampling and a simple random sampling technique will be used to select the 397 respondents. Ethical approval will be sought from the Ethical Review Board of Mount Kenya University and the National Commission of Science, Technology and innovation (NACOSTI). Additionally, confidentiality will be assured to all the respondents who will choose to be involved in the study.

10. Dietary diversity, morbidity prevalence, dietary and nutritional status of children (6 – 23 months old) in Kibera informal settlement, Nairobi County, Kenya



PROJECT TEAM

Ms. Sussyann Miriti (MPH), **Principal Investigator**
Co-Investigators: Muthomi Jasper and Rita Kanario Nyaga.

Project Summary

About 150 million children under five years are malnourished with 70% being in the developing world and 27% of these children are in Africa. According to the 2014 KDHS findings, the rates for stunting, wasting and underweight in Kenya are 26%, 4% and 11% respectively. Moreover more than one million children in the world today are estimated to be deficient in key vitamins and minerals particularly Vitamin A, iodine, iron and Zinc. Lack of diet diversification contributes to inadequate nutrient intake. In addition there exists minimal information of how dietary diversification translates into morbidity patterns and finally to nutrition status. Despite the intuitive link between diet diversity and nutrient intake the relationship between dietary diversity and nutrient intake has not yet been sufficiently validated across different environmental settings. Dietary diversity has been associated with improved nutritional status suggesting that diversity may indeed reflect higher dietary quality and greater likelihood of meeting daily energy and nutrient requirements. Presence of diseases suppresses immunity; depress the appetite inhibiting the absorption and nutrient uptake compromising nutritional status. Informal settlements are associated with limited nutritious foods, inadequate clean water and inadequate health care facilities. This study will be carried out to assess the dietary diversity, morbidity prevalence and nutritional status of children in Kibera informal settlement. A cross-sectional analytical study design will be used on 400 children (6-23 months). A researcher administered questionnaire and focus group discussion guide will be used for data collection. Anthropometric measurements will be used to determine the nutrition status. Dietary diversity will be assessed by 24-hour recall and 7-day- food frequency questionnaire. Chi-square will be used for establishing the relationship for categorical variables. Qualitative data will be summarized to establish the emerging themes. Data will be presented by pie charts, graphs and tables.

11. Assessment of cervical cancer care cascade among Women Living with HIV at Thika



PROJECT TEAM

Dr. Nilufar Sharrif, **Principal Investigator**

Co-Investigators: Alfred Owino (PhD), Ruth Mbugua (PhD).

Project Summary

Globally cervical cancer is the fourth most common cancer affecting women. Women living with HIV (WLWH) are six times more likely to develop cervical cancer as compared to women without HIV. Several factors influence the cervical cancer outcome among WLWH that include the timing for seeking treatment. The identification of the delays along the continuum of care and the existing barriers is vital in the reduction of mortality related to the dual disease burden for these patients. Therefore, this study aims to assess the cervical cancer care cascade and the lived experiences of WLWH and cervical cancer at Thika Level 5 Hospital. A retrospective cohort design will be utilized to assess the cervical cancer care cascade among WLWH and a descriptive phenomenological study design to explore the lived experiences of WLWH. The target population will consist of WLWH aged 18 years and above with a confirmed diagnosis of cervical cancer who have been receiving care at Thika Level 5 Hospital. The quantitative data will be collected from a random sample of women who are HIV positive and have cervical cancer. An interviewer-administered structured questionnaire based on the Andersen Model of Total Patient Delay will be utilized to collect data. Qualitative data will be collected through interviews from a purposive sample of WLWH and have cervical cancer attending Thika Level 5 Hospital. Quantitative data will be analyzed using the Statistical Package for the Social Sciences version 26. Qualitative data will be analysed using NVIVO version 11. Results will be presented in graphs, tables and pie charts for the quantitative data and in narrative form for the qualitative data.

12. Participatory engagement of communities and innovative social activities in implementation of health initiative in Nakuru County, Kenya



PROJECT TEAM

Dr. Serah Kimaru (PhD), **Principal Investigator**

Co-Investigators: Dr Judy Mwangi, Dr Purity Gacheri and Dr Joseph Muchiri.

Project Summary

The study is informed by the need identify the good practices in community engagement in research and social innovation in health to enhance health care delivery and responses to health emergencies in Nakuru County. The study focuses on identifying unique challenges facing health care delivery and responses to health emergencies in relation to research and social innovation in the County. The research area was selected due to its vast nature and due to the large number of community-based health research studies and social innovations in the county. The unit of analysis comprise of the completed and ongoing health research studies and social innovation within the last five years' period. Longitudinal retrospective research design has been used for the study. Ongoing Health research studies as well as studies conducted in the county for the last 5 years have also been included in the study. Triangulation approach (O' Donoghue and Punch, 2003) has been adopted for this study. Several categories of respondents are being included in the study. These includes, principal investigators and study collaborators, community members, public health, and social services providers.

13. Effectiveness of institutional rehabilitation programmes for street children in the Greater Nairobi Metropolis, Kenya



PROJECT TEAM

Prof. Kennedy Mutundu (PhD), **Principal Investigator**

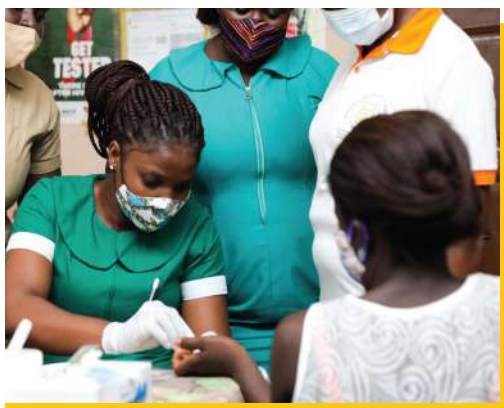
Co-Investigators: Dr. Mary Mugwe, Dr. Serah Kimaru, Dr Erastus Thoronjo, and Mr. Christopher M. Wesonga, Mr. Patrick Oyenga - Communis Minds Research & Community Resource Initiative.

Project Summary

Street children and street families in many parts of the developing world is a reminder of society's unequal development. Interventions are mostly made without support of data and evidence-based research. Cases of children and families escaping from rescue homes and going back to streets are rampant. The rescue centres are also known to be facilities of physical and welfare interventions with very little focus on transformative programmes that can contribute to the

reintegration of the children and families into society. The purpose of this pilot research is to assess the effectiveness of institutional rehabilitation programmes for street children in the Greater Nairobi Metropolis. A mixed research methodology will produce a body of knowledge that will inform the formulation of more robust and comprehensive research at a national level that will contribute to the formation of policies and interventions to address the challenge of street children and families in Kenya and beyond.

14. Analysing Community Livelihood Capability Distress Amid-outbreak and turbulences of Covid 19 in Informal settlement in Kiambu County in Kenya



PROJECT TEAM

Dr. Erastus Thoronjo (PhD), **Principal Investigator**
Co-Investigators: Dr. Martin Onsiro (PhD),
Dr. Mercyline Kamande (PhD).

Project Summary

In the recent past, the entire world encountered major health, economic and wellbeing distress due to Covid 19 outbreak. Globally, regionally, as well as locally, many families experienced death of family members, business stagnation or closure that affected community livelihood and the wellbeing of families living in urban and rural areas. As people lost their jobs, and businesses affected, many informal settlement dwellers were left not knowing where to turn to. Locally, the people were restricted to their homes and movements from one local area to another was restricted. People in the informal communities were left without source of food as well as source of any income. Everywhere and particularly in the informal settlement, managing Covid 19 become an anguish that no one had a solution to it. These happenings had a greater social, economic, psychological and financial strain to the informal settlement dwellers than any other group of citizenry. Therefore, the research is motivated to analyse Community livelihood distress a midoutbreak and turbulences of Covid 19 in Informal settlement in Kiambu County in Kenya and provide futures mechanisms that would provide a better solution to informal sectors in the outbreak of such kind of calamities. The research will focus on various informal settlements in the Kiambu, Sub-counties informal settlements. The research study will adopt Stratified random sampling and a sample of 30% will be adopted. The study will target respondents and Key informants from the major institutions, scheme-based and faith-based organizations, schools, and ordinary people living in the informal settlement.

15. Challenges and opportunities of e-commerce among women-owned small and medium enterprises



PROJECT TEAM

Dr. Mercyline Kamande (PhD), *Principal Investigator*
Co-Investigators: Dr. Maria Mungara (PhD).

Project Summary

This study seeks to investigate how women-led enterprises leverage on technology to overcome some of the challenges they face in the business world. The study seeks to explore how proper digitization planning can transform the fortunes of women entrepreneurs. The study adopts a two-fold design where in the first instance, baseline survey will be conducted among women entrepreneurs in three sub-counties in Kiambu county namely Thika, Ruiru and Juja Sub-counties to establish the level of digital investment and the uptake of digital technology in women-led enterprises. The survey will also seek to quantify the digital footprints of these enterprises. The women entrepreneurs will then be subjected to a targeted e-commerce and digital marketing training at a micro level. The effect of this of exposure on adoption of e-commerce and digital marketing is expected to vary across participants based on prior exposure to e-commerce and digital marketing training as well as the size of the business. Treatment and control groups will be defined after the baseline survey. The expected outcomes of this study is that digitization training will have a positive impact on the uptake of digital technology among women led enterprises which will eventually improve their performance.

16. Strengthening Community Health Services Delivery through machine learning model Case of community health centers in Kenya



PROJECT TEAM

Ms. Elena Mwai (MSc), *Principal Investigator*
Co-Investigators: Mr. Michael Nyoro, Dr. Jesse Gitaka (MD/PhD), Dr. Samuel Mungai (PhD).

Project Summary

Malaria remains one of the most significant global health challenges. Rapid and accurate diagnosis of malaria is crucial for effective treatment and disease management. Traditional methods of malaria diagnosis, such as microscopic examination of blood smears, can be time-consuming, require highly trained personnel, and are often not available in resource limited

settings. Recent advances in mobile phone microscopy, coupled with the power of machine learning, have the potential to revolutionize malaria diagnosis and prognosis. This study will present a deep learning and machine learning-based model for malaria diagnosis and prognosis using mobile phone microscopy images. The study will develop and validate a deep learning algorithm for accurate and efficient diagnosis of malaria parasites in blood smear images captured using a mobile phone microscope. The study will also investigate the use of machine learning algorithms for predicting disease severity based on image features extracted from these images. The proposed framework has the potential to improve the accuracy and speed of malaria diagnosis and provide prognostic information to guide treatment decisions. This research will have an important implication for malaria control and elimination efforts, particularly in resource-limited settings, where access to traditional diagnostic methods is often limited.



17. Internet of things-Based model for school safety surveillance



PROJECT TEAM

Ms . Catherine Kiare (MSc), **Principal Investigator**
Co-Investigators: Ms. Anne Ondiba (MSc).

Safety in schools involves much more than metal detectors and disaster plans. There is a need for rapid systems to monitor the students and the activities taking place within the school environment. This research aims to develop an internet of things model based on machine learning to monitor students to enhance their safety while in school. The model aims at integrating technologies using SMART monitoring and sensing devices. SMART technology means “Self-Monitoring Analysis and Reporting Technology”. This technology will be used to provide cognitive awareness to objects, by making use of advanced technologies like internet of things, artificial intelligence, machine learning and big data analytics.

B. Highlighted Project Activities



1. MKU inaugurates a state-of-the-art Laboratory and Center for Malaria Elimination, Institute of Tropical Medicine Laboratory under the theme “Advancing Health through Integrated Diagnostics”

Overview

The Centre for Malaria Elimination at the Institute of Tropical Medicine Laboratory is at the forefront of innovative research, dedicated to not only eradicating malaria but also addressing broader health challenges. Our well-equipped laboratory specializes in molecular diagnostics and collaborates extensively with various fields, including maternal health, STDs, TB, microbiology, and COVID, through integrated diagnostic approaches. Under the visionary leadership of Dr. Jesse Gitaka, our multidisciplinary team is committed to advancing healthcare solutions for a healthier world.

Laboratory Expertise

Our laboratory is equipped with state-of-the-art facilities that allow us to conduct a wide range of molecular diagnostic tests. While our primary focus is on malaria research, our capabilities extend to collaborating with other health sectors. We are adept at performing molecular diagnostics for maternal health, STDs, TB, microbiology, and COVID, as well as providing point-of-care diagnostics to facilitate rapid and informed decision-making.

Team Composition

The strength of our center lies in the diversity and expertise of our team. Under the mentorship of Dr. Jesse Gitaka, the laboratory consists of a dynamic group of young researchers, dedicated research assistants, master's and Ph.D. students, and postdoctoral fellows. This collaborative and inclusive environment ensures a holistic and innovative approach to addressing complex health challenges.

Research Focus

Our research initiatives span across various domains, emphasizing an integrated approach to diagnostics:

- **Malaria Elimination Strategies** : We continue to lead in malaria research, developing and optimizing strategies for the effective elimination of the disease.
- **Maternal Health Diagnostics** : Working closely with maternal health experts, we contribute to the development of diagnostic tools and strategies for ensuring the well-being of mothers and infants.
- **STDs and TB Detection**: Our team is actively involved in the molecular diagnosis of sexually transmitted diseases (STDs) and tuberculosis (TB), contributing to early detection and effective management.
- **Microbiology Research**: We explore innovative diagnostic approaches for a range of microbiological challenges, enhancing our understanding and management of infectious diseases.
- **COVID Diagnostics** : In response to the global pandemic, we have redirected our expertise towards developing and validating diagnostic methods for COVID-19, supporting public health initiatives.

Collaborations

We actively seek collaborations with healthcare institutions, research organizations, and public health entities to foster a comprehensive and integrated approach to diagnostics. By working together, we aim to address health challenges more effectively and contribute to improved patient outcomes.



The Japan Ambassador to Kenya, H.E. Okaniwa Ken cuts the ribbon during the official launch of the state-of-the-art Centre for Malaria Elimination laboratories at Mount Kenya University. He was flanked by the Pro-Chancellor, MKU, Dr. Vincent Gaitho (Right) and Vice Chancellor, MKU Professor Deogratius Jaganyi (Left)

2. Africa Centre for Career Enhancement and Skill Support (ACCESS) Activities 2023



**African Centre for Career
Enhancement & Skills Support**



Dr Henry Yatich
ACCESS, Kenya Coordinator and Principal,
College of Graduate Studies and Research

The Africa Centre for Career Enhancement and Skill Support (ACCESS) is an initiative of the University of Leipzig funded by DAAD. Its primary focus is to conduct research, discussions and consultations about Africa's increasing education in respect with labour market opportunities. At the heart of this project is the goal of developing new teaching methods and transfer of knowledge and skills to strengthen the employability of African students. To do this, we work together with companies, universities and students so that we increase the opportunities of African students in the global labor market and connect them with companies that can benefit from their expertise. More information can be obtained from <https://access-centre.org/en/projekt/>.

ACCESS is premised on four pillars (Capacity Building, University Business Linkages, Employability Research and Entrepreneurship Academy). It brings together a team of regional universities (University of Leipzig, Germany; University of Ibadan, Nigeria; University of Tunis, Tunisia; INES-Ruengeri, Rwanda; KNUST, Ghana; IGRIB, Benin and MKU, Kenya).



3rd Summer School, MKU-Kenya 2023

Mount Kenya University hosted the 3rd International Summer School Kenya 2023 at Mount Kenya University, Main Campus – Thika and at School of Business and Economics, Nairobi Campus. The 5-day workshop saw delegates participate in panel discussions, company visits, breakaway discussions and excursions that culminated to the development of tools and strategies for next phase of ACCESS-UBL activities 2024-2025. The workshop brought together more than 30 delegates from Germany, Tunisia, Ghana, Nigeria, Benin, Rwanda and Kenya. Previous Summer Schools were held in Ghana, Tunisia and Benin.



*4th Summer School and Conference-
University of Ibadan, Nigeria*

The MKU-team at the Nigeria International Summer School, were represented by the MKU-ACCESS Coordinator and Principal College of Graduate Studies (Dr. Henry Yatich-Left), Dr. Kihara Milka Muthoni (Medical School), Ms. Kiamba Linet Muthoki Joshua (School of Public Health), Dr. Shariff Nilufa Reyaz A M (School of Nursing), MKU-Nakuru Campus Lecturer (Dr. Allan Mweke), Principal, Campuses Coordination & Institutional Compliance (Dr. Nahashon Mwirigi), and MKU-Kisumu ODeL Coordinator (Mr. Russel Ouma).



This is was the first time, campuses representation were involved in international research programmes, to foster knowledge transfer among participating teams under the ACCESS project. The university is keen in engaging all academic staff in research participations. This is expected to create more impetus in fostering increased participation in research and community engagements in 2024 and in the coming years.

3. The 8th International Interdisciplinary and Inter-Universities Consortium – Africa Research Conference (8IIUC-A 2023) – March 29th to 31st, 2023



Mount Kenya University hosted the 8th International Interdisciplinary and Inter-Universities Consortium – Africa Research Conference (8IIUC-A 2023) on 29th - 31st March 2023 at the Mwai Kibaki International Conventional Centre (MKCC) at Mount Kenya University, Main Campus – Thika. The Conference opening ceremony was graced by Prof. Walter O. Oyawa, CEO- National Commission for Science Technology and Innovation (NACOSTI). Other guests present during the opening ceremony were: Dr Jane Nyutu (MKU Co-founder); Dr Vincent Gaiho (Pro-Chancellor, MKU); Prof. Deogratius Jaganyi (Vice-Chancellor, MKU); Prof. Eli Katunguka (Vice-Chancellor, Kyambogo University); Dr. Mercyline Kamande (Deputy Vice Chancellor, ARA). In addition, representatives from the following partner institutions were also present; University of Eldoret, Chukwuemeka Odumegwu Ojukwu University, University of Makeni, Kyambogo University and Vincent Pol University.

After the opening ceremony, the conference was officially opened for presentations both physical and online. One hundred and three presenters (103) made their presentations in four breakaway sessions under separated by themes.

4. IEEE AFRICON 20-22nd September 2023 Conference, at KSMS, Nairobi, Kenya



Panel Members:

Prof. Meoli Kashorda, Executive Director, KENET (Left)
Prof. Thomas JO Afullo, Emeritus Professor, University of Kwazulu-Natal, SA.
Prof. Fuluphelo Nelwamondo, CEO, National Research Fund, South Africa
Prof. Nelson Ijumba, IRI, Programme Manager, Coventry University, Rwanda
Dr. Henry Yatich, Principal, (CGSR), MKU (Right), Representing the VC, MKU

During the IEEE AFRICON 20-22nd September 2023 Conference, themed: Challenges of Postgraduate Research Management and Funding in a Private University, Dr. Yatich represented the MKU VC and made a presentation on funding models and challenges of postgraduate training in Africa. He noted that, Africa's target, adopted by heads of state in 2007 on R&D, is 1% of GDP on R&D., but most countries are yet attain the target with South Africa leading with an annual expenditure of 0.85 of GDP on R&D, Kenya 0.81. However, most of these funds are from foreign institutions. Globally, increased spending on research has been documented (UNESCO). The world leaders are USA and China. He also noted that almost 90% of postgraduate students' challenges. He challenge the participants to reconsider novel and attainable strategies to boost research throughout both for early career and experienced researchers.

5. Research Innovation and Digital Agri Expo 2023 (RIDAE_2024)



The college of graduate studies and research held its first inaugural Research, Innovation & Digital Agri Expo 2023 (RIDAE_2023) between 22nd November and 24th 2023. This is an event that endeavours to share research and innovation outputs with communities and industry partners. In living up to the SDG 12 and SDG 17, we strive to promote Responsible

consumption, consumption and partnership for goals. This is in line with the University Research Focus, which acknowledges the role of Science, Technology and Innovation (STI) in promoting research as a measure in solving societal and economic challenges for improved livelihoods, health and promote quality training among our postgraduate students. Through industry and community linkages, we aim to create a nexus between academia and industry to support practical-oriented learning. This is an event that attracted more than 20 industry exhibitors and we hope that the second RIDAE_2024 will even be a larger synergetic event. Through the event the top 3 student innovations are awarded cash awards to enable them improve on their innovation in preparation for commercialization phase. The award is meant to support the innovators meet the registration requirement with KIPi and support their mentorship at the MKU Innovation and Incubation Hub for 6 months. The best 3 poster award also receive a plague award and certification, while the best 3 exhibition booths also are recognized with a plague award. It should be noted that most of the research posters show-cased are a result of multimillion research grants that the university won both individually and as consortium grants to the tune of more than KES. 80,000,000.



6. Partners for Care (PFC) WaterSafe Project



Dr. Henry Yatich (MKU) and Ms. Ashley Waudu (PFC) during one of the networking event at PFC offices in Nairobi, October 2023.

In promoting solutions to community challenges, the university is currently working with Partners for Care (PFC) to carry out research on waterborne disease prevalence in Kenya so as to support PFC's initiative of distributing WaterSafe backpacks to all primary and secondary schools classrooms in Kenya in 2024. The programme is being rolled out in collaboration with the Lumumba Foundation, with Key government stakeholders being sought.

7. Poster Presentation at the 50 Years DAAD in EA, Nairobi



Dr. Henry Yatich (4th Left, standing) during the 50 Years Anniversary in Nairobi, in September, 2023.

DAAD has supported significant research programmes that have benefited MKU through consortiums. During the 50th Anniversary, MKU presented the ACCESS poster programme to the participants to showcase some of the initiatives being piloted at MKU, the Service-Learning Pedagogy.

C. University Research Milestones Towards Supporting Community Based Entrepreneurship Projects and Patents

The Mount Kenya University has put research at the Centre of Academia and community development. It has established a Research Centre that in the College of Research and Post Graduate Studies under the Directorate of Research that is open to staff, students and the public. According to the Head of the Centre, Dr. Jared Onyancha, the University has a policy in place, approved in the year 2023 to allow individual members or groups of people to access and use the research facilities at the University. Such Research facilities host the state of the art instruments for Spectroscopic, Chromatographic, Microscopic, Cell and Parasite Culture, DNA Amplification techniques that support a myriad types of research Research that support students and communities. The major facilities that house the instruments include Phytochemistry and herbal drug development, Molecular biology, microbiology, Centre for malaria elimination and Botanic garden.



*Dr. Jared Misongye Onyancha
PhD (Head of Research Centre)*

In line with the University's 2020-2029 strategic plan and in an endeavor to meet the demands of the global Sustainable Development Goals has made milestone contributions to Kenya's Vision 2030. The university has purpose to engage in problem solving based research with supporting community to earn a livelihood by researching to improve the quality of their soap and commercialize the soap in the year 2023.

Steps towards commercialization of the herbal soap manufactured at Mount Kenya University.

1. Meetings to prepare working relationship with a group of Muranga Traditional Medicine Practitioners Association'

A group of MuTPA who approached the University management to register their herbal product by the Pharmacy and Poisons Board made an agreement and developed a working relationship to improve the herbal medicines through research. During the year 2023, the understanding to develop and sign a joint Memorandum of agreement to indicate how the benefits shall be shared was developed and the research led to the development of a 100% herbal soap containing activated bamboo charcoal as the main ingredient.



A flier indicating the developed soap and the benefits

2. Laboratory developments and Initial soap production for market testing

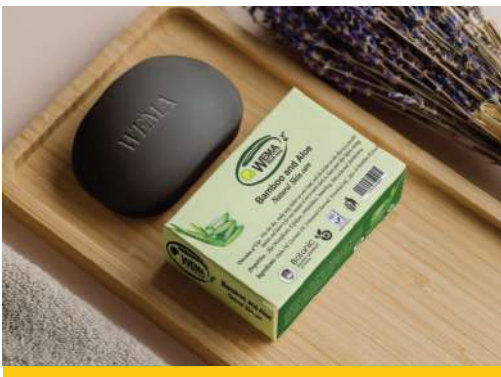
The minimum viable product formula of the herbal soap was attained and industrial up scaled trials were done successfully. The product name “Wema Herbal Soap” was submitted to Kenya Industrial Property Institute (KIPI) for copyright protection and at the same make the bathing soap was qualified for quality based on East African Standard for Bathing soaps (KS EAS 877:2017 with SM no. 70376.



Laboratory hand-made soaps



Up-scaled Machine made soaps



The Wema black soap for market testing

The black herbal soap has been given as a gift to University Guests including the Vice President of the Republic of Namibia - His Excellence Nangolo Mbumba and his team, who visited the University during the Nairobi Climate Summit 2023. The soap has been given as free samples to Members of the University Council, University Management, staff, students and the community around MKU Thika Campus. In addition, the soap was available to some people who visited the MKU tent during the Nairobi International Trade Fair (2023), the Research and Innovation Week at MKU Thika campus and during the 24th graduation ceremony of Mount Kenya University at MKU pavilion.



Black soap and bar soaps exhibited during the Research and Innovation week MKU Conference Centre



Black soap and bar soaps exhibited during the 24th Graduation ceremony and MKU pavilion

Currently, the Research Centre is collecting responses from the users of the black herbal soap using an online tool. This is expected to provide information to propose areas of improvement as the University intend to launch the soap and allow commercialization. It is only by this way that the researched soap will get to the various counties in the country, beginning from the near county (Kiambu) to the furthest like (Elgeyo and Malindi) using the University Campuses as distribution points.

3. University support to ensure Market Sustainability and Diversification

The research Center has continually planned for establishment of Collaborations including Group of farmers who plant medicinal herbs, Institutions that deals with flora and fauna like Kenya Forest Research Institute and Kenya Wildlife Services, Kenya Medical Research Institute, The National Phytotherapy Laboratories at Kenyatta University among others. The collaborations will ensure continuous access, supply and processing of raw materials. The University also, embarked on the establishment of tree nursery at the University Botanic garden to plant Aloe, Bamboo and other medicinal plants for research and source of raw materials.



Attendees of the workshop on Enhancing Research Skills Beyond the Realm of Immunology; Engaging young scientists on immunological research and the general sense of conducting research in a resource limited setting - Mount Kenya University (MKU) 23rd – 24th November



Attendees, among them, the Deputy Vice-Chancellor, Administrations & Institutional Planning, Dr Peter Kirira (seated on from-row in the middle) and Dr Carol Kijogi (The Project PI) follow proceedings during the workshop on Enhancing Research Skills Beyond the Realm of Immunology



Site as signed for setting Tree Nursery planting and Growing 5000 at the Botanic Garden plants at the University botanic Garden (Nov. 13th 2023)

The Tree Nursery is an entrepreneurial venture for commercialization of the tree seedlings. In addition to research, training, environmental conservation and community engagement. The research project for this innovation was funded by the University in the year 2023. The University commitment in the year 2024 is to take the soap to the near and far people. Therefore, the University has pledged to support the project till its break for even that is proposed to be the year 2026. Equally, the researchers in this project have made attempts to mobilize funds by writing competitive proposals for funding and there is gig goodwill that the project is for the people of Kenya and the soap will be the Pride of the University to solve skin care issues of the users.

D. Postdoctoral Research Fellows' Corner.



Dr Bernard Kanoi PhD (Life Sciences)

Contacts : bkanoi@mku.ac.ke

Personal Website: www.bernardkanoi.com

Social media: <https://www.researchgate.net/profile/Bernard-Kanoi>

Dr. Bernard Kanoi is a Biomedical Scientist and an EDCTP Fellow at the center For malaria Elimination, Institute of Tropical medicine, Mount Kenya University (MKU). He holds a degree in Biomedical Sciences, PhD in Life Sciences (Japan), Postdoctoral Training in Malariology (Japan), and Visiting Assistant Professorship, (Ehime University, Japan).

Prior to Joining MKU he served as the Assistant Professor at the Division of Malaria Research, Ehime University, Japan where he remarkably contributed to the optimization and application of the innovative wheat germ cell-free system in malaria research through high-throughput immuno-profiling and reverse vaccinology studies. Before then, he was an Investigator in the conduct of blood-stage BKSE36 malaria vaccine trials and follow-up studies in Northern Uganda. As a Marie Curie Research Fellow (in Uganda), he worked on the immunology of malaria in children.

Dr. Kanoi has co-authored more that 40 original peer-reviewed research papers on different subjects. Several of the papers are published in high impact journals. He is a review editor to several international scientific journals. And, he has received several awards and fundings to support his research. His current studies focus on understanding how immunity against malaria-causing parasite is acquired (or lost) in children and during pregnancy, and how it mediates protection against subsequent infections, for vaccines, immunotherapeutic, and biomarkers discovery. Other studies focus on sero-surveillance, and understanding the interphase between malaria, COVID-19 and Tuberculosis. He is applying -omics, immunological, and classical molecular biology tools as well as field studies.



Dr. Clement Shiluli (PhD),

A Postdoctoral Researcher

Mount Kenya University

Research highlights and activities:

Currently, my research is mainly focused on development of highly sensitive molecular point of care diagnostics for curable sexually transmitted infections and pulmonary Tuberculosis. These infections are associated with an enormous health and economic burden globally and more so, on the African continent. Sensitive molecular tests will help improve patient management by early disease diagnosis and greatly reduce the turn around time of available conventional tests.

Recently, data collected from our laboratory has been presented in local and international meetings and more than 5 publications are in the pipeline. This year alone, we have submitted oral and poster abstracts at the STI and HIV Congress and the Union World Conference in the USA and France respectively.



*Oral presentation during the 13th KEMRI Annual Scientific and Health (KASH) conference that was held at safari park from the 15th – 17th February 2023. The conference theme was titled “**Rethinking strategic research-for-health through partnerships, innovation, evidence generation, and knowledge sharing in post-pandemic recovery era**”*



Dr. Caroline Kijogi (PhD),
PhD in Medical Sciences

Previous research experience:

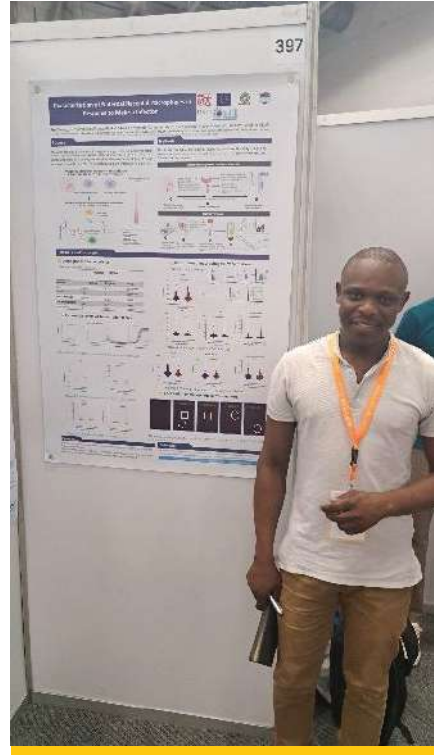
I am a researcher in infectious disease science with a focus on malaria but have had the opportunity to engage in a range of scientific questions outside of this field. While an undergraduate I participated in research exploring the reduction of dietary intake below energy requirements while maintaining optimal nutrition (calorie restriction), in attenuating aging. Soon after for my master’s studies, I researched on Prothymosin-alpha as a molecule with a pathophysiological role in protection of neurons during stroke. In my doctoral work, I studied how immune responses to malaria are modulated in asymptomatic infections. I have also been involved in studies on the diagnosis of maternal bacterial infections and antimicrobial stewardship.

Current research:

Now a fellow at Mount Kenya University, my research interests are centered on understanding the interplay between the malaria parasite and immune responses in the context of pregnancy and the placenta. With a highly specialized immune system the placental immune response following invasion by pathogens has potential to cascade into events that consequently affect the outcome of the pregnancy. By understanding the immune led pathogenesis in the placenta in this case, of malaria infection, the study will give new insights that can be adopted to development of new strategies to combat the disease.



Mr Fred Owino, a Master student on Dr. Kijogi's project presents a poster at AIBBC Conference



Mr. Owino at UICC Conference, South Africa



Dr. Ernest Wandera
PhD in Medical Science
(Tropical and Emerging Communicable Diseases)

Dr Ernest Wandera is a Postdoctoral Research Fellow at the Directorate of Grants and Development, College of Graduate Studies & Research, Mount Kenya University. He holds a PhD in Medical Science (Tropical and Emerging Communicable Diseases) from Nagasaki University, Japan and a Postdoctoral Fellowship in Pathogen Point-of-Care Diagnostics from Mount Kenya University and the University of Hull, UK. He's driven by a strong desire to apply basic and clinical research knowledge in the development, implementation and evaluation of high-impact and cost-effective public health intervention tools such as vaccines and diagnostics to prevent and control infectious diseases. Previously, while working at KEMRI/Nagasaki University, Institute of Tropical Medicine, Dr. Wandera spearheaded research involving epidemiological and genomic surveillance of diarrhoeal pathogens; evaluation of rotavirus vaccine impact and effectiveness; determination of seasonality of rotavirus disease; development and application of novel pathogen detection systems; and training in biosafety and biosecurity. Currently, at MKU, Dr. Wandera is conducting studies exploring novel

approaches to disease diagnosis such as microfluidic point-of-care diagnostic devices for maternal pathogens, *Cryptococcus neoformans*, COVID-19 and iron deficiency anaemia. He has co-authored several publications in peer reviewed journals and presented his research work in various international and local conferences.

E. MKU Researchers disseminate findings from various studies



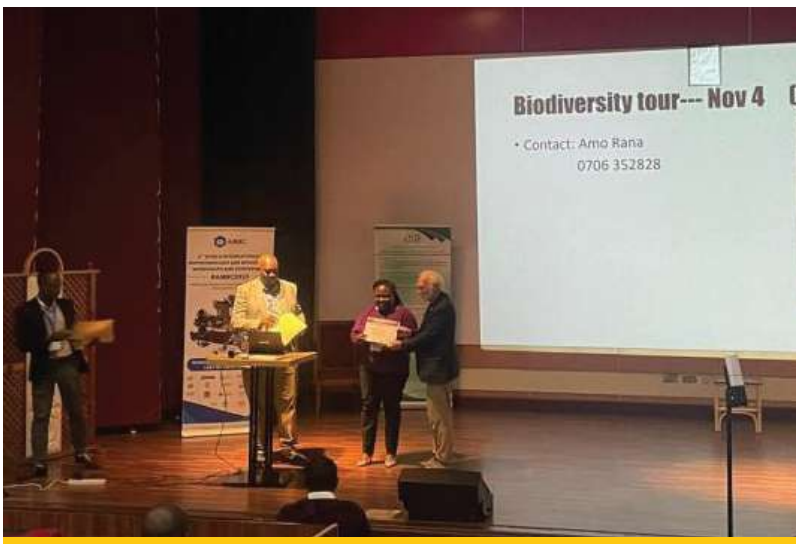
*Dr Francis Makokha (PhD), Head Human Health Research Programme/ Director Research and Innovation, Mount Kenya University, was among the panelist on the 1st Cancer Research Symposium which was held at Kenyatta University from 6th to 8th December, 2023. Theme of the symposium was Capacity Building for Molecular Cancer Research and Care in Kenya. His presentation was on **Whole exome sequencing of breast tumors from African American, European American and Kenyan patients shows population specific mutational patterns.***



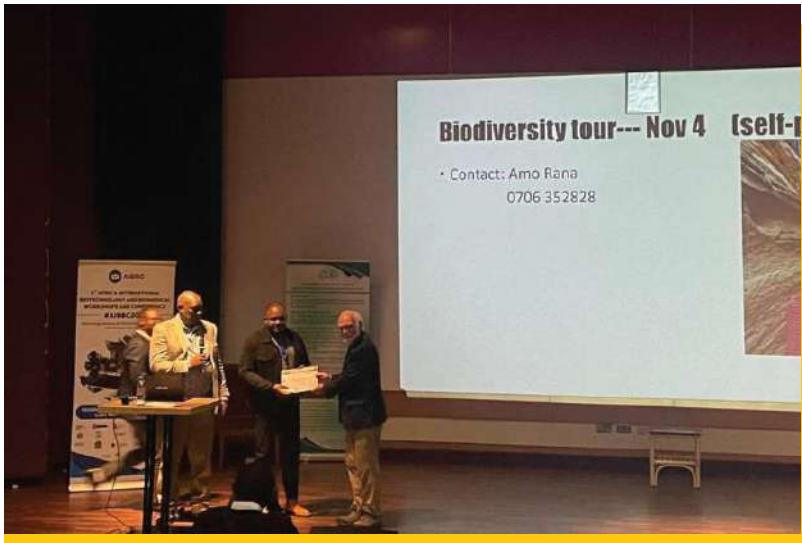
Ms. Lucy Mwai, a PhD student at the Centre for Malaria Elimination, Mount Kenya University, presents findings from her research on placental malaria immunity at the 6th African International Biotechnology and Biomedical conference held at the Lake Naivasha resort in November 2023



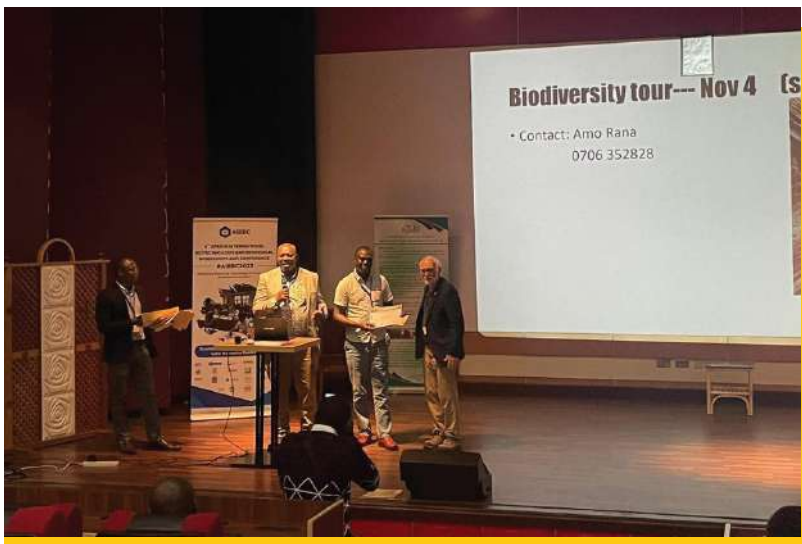
Members of the Centre for Malaria Elimination laboratory pose for a group photo during the 6th African International Biotechnology and Biomedical conference held at the Lake Naivasha resort in November 2023.



On the left, Ms. Lucy Mwai, a PhD student at the Centre for Malaria Elimination receives a certificate for second runners up position from Prof. Paul Robinson of Purdue University for the oral presentations during the 6th African International Biotechnology and Biomedical conference held at the Lake Naivasha resort in November 2023. Looking on is Prof. Collins Ouma, Maseno University, Director of Research and international linkages and also the General Chair of the AIBBC



Above, Mr. Harrison Waweru a PhD student at the Centre for Malaria Elimination receives a certificate for best poster presentations during the 6th African International Biotechnology and Biomedical conference held at the Lake Naivasha resort in November 2023.



Mr. Sam Mbugua, a research assistant at the Centre for Malaria Elimination receives a certificate for first runners up poster presentation during the 6th African International Biotechnology and Biomedical conference held at the Lake Naivasha resort in November 2023.



Dr. Jesse Gitaka, Director Research and Development presents key findings on the application of point of care diagnostics in screening asymptomatic infections in pregnancy during the EDCTP-MKU Immunology workshop.



Ms. Mary Wachira, a research assistant at the Centre for Malaria Elimination, Mount Kenya University, presents findings from her research on the detection of active Cryptococcal meningitis infection in immunocompromised patients at the 6th African International Biotechnology and Biomedical conference held at the Lake Naivasha resort in November 2023.



Dr. Bernard Kanoi (left) and Dr. Francis Kobia (center) of Mount Kenya University met with Dr. Michael Makanga (second from left), Executive Director of European & Developing Countries Clinical Trials Partnership (EDCTP), at the sidelines of the EDCTP Forum in Paris, November 2023. EDCTP's generous support funds four ongoing research projects at Mount Kenya University, contributing significantly to advancing scientific excellence and public health research in Kenya and Africa.



Dr Francis Kobia (MKU) presenting his poster to a conference participant at the EDCTP Forum in Paris (Nov 6-10 2023). His work focus on maternal foetal conflict in malaria infections during pregnancy.



Dr Bernard Kanoi making a presentation at the Africa CDC Molecular and Genomics Environmental Surveillance workshop in Cape Town, September 2023. Mount Kenya University is keen to spearhead the development and implementation of sensitive surveillance tools to tackle emerging public health threats in Africa. The workshop, which took place from September 26th to 28th, spanned two and a half days. It drew a diverse audience, featuring 39 in-person representatives (photo) on the right) and 14 virtual participants from African Union member states and partner organizations. The introduction of molecular and genomic environmental surveillance (ES) techniques presents a unique opportunity to address some of the inherent limitations associated with traditional clinically based epidemiological approaches. These techniques can serve as a valuable complement to clinical surveillance, acting as an early warning system for the detection of infection trends and the emergence of new mutations or variants of pathogens.



A team from the Centre for Malaria Elimination pose for a group photo during the 6th African International Biotechnology and Biomedical conference held at the Lake Naivasha resort in November 2023. The group scoped 4 out of the 6 best presentation awards. Congratulations to the team.



Capturing the moment of collaboration and dedication. A stakeholders engagement meeting held at Mount Kenya University to explore the potential for wastewater surveillance as a tool to inform the status of infectious diseases within Kiambu County.



Captivating moments of knowledge exchange and collaboration. Dr Francis Kobia (far right) together with the team at a stakeholders meeting held at Webuye County Hospital to discuss the essence of progress in malaria research at Webuye County, Western Kenya.



Breaking new ground in malaria research! Researchers from Ehime University and Mount Kenya University discuss cutting-edge malaria vaccine development at a seminar held at Mount Kenya University in May 2023.



Celebrating a successful workshop on immunology and grant writing with colleagues from University of California, San Francisco, and Mount Kenya University. The workshop was held at Mwai Kibaki Convention Centre, Thika.



Strengthening collaboration between Mount Kenya University and Mpala conservatory on genetics and nutrition surveillance

MKU and University of Ss. Cyril Methodius in Trnava (Slovakia) (UCM) win Erasmus mobility plus grant

The University of Ss. Cyril Methodius in Trnava (Slovakia) Faculty of Arts and the Mount Kenya University School of Social Sciences won Erasmus Plus mobility grant (Ref: AK 171) for both faculty members and postgraduate students. The project will cover twenty mobilities for staff and PhD students between the two institutions for a period of 2 years (2023-2025). MKU team led by Dr Serah Kimaru (Dean, School of Social Sciences), Dr Judy Mwangi (Lecturer, School of Social Sciences) and Mr Bonface Joel Malala (Head, Grants Office) visited UCM from 25th September to 8th October 2023 for the first faculty exchange program. During the visit the teams identified postgraduate student seminars and workshops and research collaborations including co-authorship of peer reviewed publications as areas of engagement between the two universities.



MKU team visiting the Faculty of Health Sciences (UCM University, located in Piestany town, Slovakia)



MKU team paying the courtesy call to the Vice Chancellor -UCM



The MKU team Visited the UCM Erasmus Mobility Project Technical Coordinator Ms. Simona Stefickova

F. Highlighted Faculty Projects

Project Title: Biodegradation of acaricidal residues in the environment: Curbing accumulation of organophosphates .



Dr. Paul S. Oshule

The Department of Biochemistry, School of Medicine, College of Health Sciences

This project, funded by the National Research Fund (Kenya) is led by team Dr Paul Sifuna Oshule (Principal Investigator) and Dr Suliman Essuman (Co-PI), both from the School of Medicine is being implemented in collaboration with the University of Nairobi, Pwani University and Technical University of Mombasa. Commenting on the project progress, Dr Oshule states that “Stakeholder meetings have been carried out to educate dairy farmers on the type and use of acaricides, role water quality for agricultural and domestic use, the level of environmental contaminants and sustainability of government funded livestock based infrastructural projects in Kilifi County”. The project is on course for completion currently undertaking optimization of bacterial consortium laboratory conditions and biodegrader design. Additionally, two Masters Students graduated in July 2022 and other two are currently working on their thesis research and are expected to graduate in 2024. The PhD in Microbiology student is currently scheduled to finish in December 2024.

Project Title: Unlocking infinite educational opportunities inside a Kenya prison.



Dr Benson Njoroge

Dean School of Education and project PI

This project involves the use of interactive software loaded in CDMA disabled tablets and secure access of e-learning offline without the use of internet in six Maximum prisons in Kenya: Naivasha, Kisumu, Nyeri, Langata, Kamiti and Shimo la Tewa. The project procured distributed 26 procured tablets to the 6 study sites for use by the inmates in accessing formal education. The Projects utilized Mr.Signal Technology. The prisons are not equipped with Science Laboratories. This project has provided a solution to this by installing virtual labs for Biology, Chemistry and Physics. Self-placed materials in the FOUR stem subjects in KCSE were prepared by subject experts and were converted to self-paced SCORM files (Sharable Content Object Reference Model-a set of technical standards for eLearning software products). They are uploaded in the Mr.Signal Learning Management Learning System by powering the Mr.Signal base. In the prison, a Mr.Signal base is powered and this generates a LAN network. This picks the content in the cloud using WIFI via the



Mr.Signal Base

CDMA disabled

Induction of Prison Education officers on the use of Mr.Signal Bases and CDMA disable laptops to access elearning at Kamiti Maximum prison on 15th January 2023. Picture Courtesy of NPS



Standard Base

The base, which is the name of the product, provides users local WIFI connection but only within the Mr. Signal network.

Cancer Genomics Group



Dr. Francis Makokha,
Principal Investigator, Cancer Genomics Group

Cancer remains a major global health problem and the 3rd cause of mortality in Kenya. It is projected that cancer will be one of the leading causes of morbidity and mortality by 2050, with Sub-Saharan Africa bearing the heaviest burden. In Kenya, like other Sub-Saharan African countries, cancer is diagnosed in its late stage where little can be done in terms of treatment. The problem is compounded by a paucity of data on the genetic drivers of cancer in Kenya, in addition to lack of comprehensive cancer registries that can be utilised to monitor treatment outcomes, survival and development of mathematical models to predict outcomes in the future. The lack of genomic data limits the utilisation of genomic medicine for personalised treatment and management of cancer. The Cancer Genomics Group aims to address this gap by implementing studies that seek to identify mutational signatures and gene expression profiles of cancer in Kenyan patients. The group has also worked with partners to develop data pipelines through building population and hospital-based cancer registries. The group have leveraged collaboration with other institutions such as The Aga Khan University Hospital (AKU, Nairobi), AIC Kijabe Hospital, Department of Health, Machakos County, International Agency for Research in Cancer (IARC) and the National Cancer Institute (NCI, USA) to generate data aimed at providing a baseline for translational research.

One of the flagship projects of this group in Breast Cancer Genomics. Collaborating AKU and NCI (USA), the group reported that Kenyan women diagnosed with breast cancer had mutations in ARID1A genes that were absent in their African and Caucasian American counterparts. In a paper published in Cancer Communications (<https://aacrjournals.org/cancerrescommun/article/3/11/2244/730015/Population-specific-Mutation-Patterns-in-Breast>), the authors report population specific mutations, indicating differences in the biology of the disease and hence the need for personalising diagnosis and treatment of cancer. The group has also worked, in collaboration with the University of Southern Florida to determine the types of immune cells within the tumour microenvironment. Currently, the group is working to establish the role of genes associated to salt sensitive hypertension in breast cancer progression. Currently, the group is planning to implement validation studies to validate the ARID1A use as a mutational signature for breast cancer in Kenya. It is also working with IARC to study the whole genome and the metabolome of breast cancer.

Other studies have in the past led to the establishment of population-based cancer registries in Machakos and Nyandarua counties and a hospital-based registry. The group also works with collaborators to study cancer stigma, experiences of cancer patients after diagnosis, cervical cancer awareness and uptake of preventive services.

Gitaka Lab



Dr. Jesse Gitaka,

Director Grants & Development and Principal Investigator Gitaka Lab
Email: jgitaka@mku.ac.ke

Dr Jesse Gitaka a Physician scientist, senior lecturer, and principal investigator at Mount Kenya University. His research focuses on tropical diseases, maternal and newborn health through the development of improved, fast and reliable rapid diagnostics for applications mainly in resource-limited settings. He is also the lead scientist at GitakaLab. Mount Kenya University (MKU) through GitakaLab research team has embarked on a transformative journey in maternal health diagnostics, unveiling several pioneering projects aimed at revolutionizing care for mothers and infants. One notable initiative focuses on the swift detection of Group B Streptococcus (GBS) in artificial urine samples. Utilizing innovative techniques such as IFAST and ATP bioluminescence assays, the project aims to significantly reduce the time it takes to identify GBS bacteria, enhancing the efficiency of maternal care and ensuring timely interventions for improved outcomes.

In a parallel effort, MKU has delved into community referral and follow-up for sick young infants with Possible Severe Bacterial Infection in Turkana County, Kenya. This initiative emphasizes the crucial role of community engagement in healthcare, drawing valuable lessons for enhancing infant health outcomes. MKU recognizes the pivotal contribution of communities to maternal and child health services, leveraging their participation for more effective healthcare delivery. Another significant project at MKU focuses on advancing Gonorrhoea Molecular Diagnostics through a genomic approach. By employing Genome Mining-Based Identification of Identical Multi-Repeat Sequences (IMRS) in *Neisseria gonorrhoeae* Genome, the research aims to enhance the accuracy of Gonorrhoea diagnosis, addressing a critical aspect of reproductive health. MKU's genomic insights contribute to the development of more precise diagnostic tools, ensuring timely and effective treatment for individuals affected by Gonorrhoea. In a groundbreaking move, MKU has pioneered an integrated microscale immiscible phase extraction coupled with isothermal amplification for colorimetric detection of *Neisseria gonorrhoeae*. Published in *Analytical and Bioanalytical Chemistry*, this project showcases MKU's commitment to advancing diagnostic methodologies. The technique not only enhances the precision of *Neisseria gonorrhoeae* detection but also simplifies the process, making it accessible and applicable in diverse healthcare settings. These projects extend beyond laboratories and face real-world challenges during protocol testing in Kenya. MKU acknowledges the importance of translating research into practical solutions that can be seamlessly integrated into existing healthcare systems. By addressing challenges on the ground, MKU ensures that its innovations are not only scientifically sound but also feasible and impactful in real-world healthcare scenarios.

MKU's dedication to community engagement is evident in these projects, recognizing that effective healthcare requires collaboration with local communities. Actively involving communities in research and healthcare initiatives, MKU fosters a holistic approach to maternal health, acknowledging the interconnectedness of scientific advancements and community well-being. "Our work on Maternal and Newborn Health aims to reduce the huge burden suffered by women and neonates in Africa. It is estimated that up to 18% of deliveries in some African countries are premature, contributing to about 35% of neonatal mortality. Inability to diagnose maternal infections and predict the risk of adverse pregnancy outcomes prevents

timely interventions. The existing strategies to test for infections in pregnancy are not sensitive enough, do not necessarily indicate current infection and require sophisticated infrastructure and equipment. Our lab is developing assays and tests that have the potential to enable rapid and highly sensitive testing of these infections routinely in the Ante Natal Clinics enabling prompt clinical actions”, stated Dr Jesse Gitaka who is the lead at GitakaLab, based in Mount Kenya.

As MKU continues to lead the way in maternal health diagnostics, these projects stand as beacons of innovation, contributing to the global knowledge base and offering practical solutions to the unique challenges faced by mothers and infants in diverse communities. MKU's role as a catalyst for positive change in maternal health outcomes is undeniable, and these projects serve as testaments to the institution's commitment to transforming healthcare for the better.



Dr Jesse Gitaka in a working session at the Malaria Elimination Centre. Mount Kenya University Unveils Breakthrough Study on Wastewater Surveillance for Epidemic Preparedness



Ever wondered if our wastewater could be the unsung hero in the battle against future epidemics? Well, at Mount Kenya University, we've dived deep into the world of wastewater surveillance, turning it into a powerful tool for predicting and combating infectious diseases.

In our latest escapade led by the Dr. Jesse Gitaka and his dynamic members, we've uncovered a groundbreaking study: "The Integration of Environmental Sampling with Clinical Testing to Inform COVID-19 Surveillance and Infection Control in Kenya." We harnessed the mysterious powers of wastewater to keep an eye on the sneaky LAKERS-CoV-2 virus. Imagine this – our wastewater not only tells us about the infections swirling in our communities but also gives us a heads-up before the clinical symptoms kick in.

Picture this: a team of researchers armed with Moore swabs (yes, swabs for wastewater, not just your nose!) venturing into Thika municipality to collect samples from various sites from November 2021 to November 2022. We've eavesdropped on our wastewater to catch any signs of trouble. And you know



what? We found some! Turns out, our wastewater is like a secret diary for viruses. We've detected the genetic traces of SARS-CoV-2 in a whopping 16.5% of wastewater samples. That's right, folks, your flush might just hold the key to unraveling epidemics before they unfold. But wait, there's more – we've got the seasons playing their part in this drama. Turns out, the warmer months have our wastewater buzzing with more viral action than the colder months.

It's like the virus is throwing a pool party in the pipes! And when it rains, it pours... SARS-CoV-2 RNA, that is. Here's the exciting bit – the analysis of these groundbreaking samples wasn't just done anywhere; it happened in the newly commissioned Institute of Tropical Diseases at Mount Kenya University. This state-of-the-art facility is where the magic unfolds, providing the cutting-edge environment needed to decode the secrets hidden in our wastewater.

In March 2023, we gathered our allies – public health officials, Thika Level 5 hospital, the veterinary department, and the Thika Water and Sanitation Company (Thiwasco) staff where we informed them of our study design, objectives and our preliminary findings.



But the excitement doesn't stop there. In October 2023, we proudly presented this groundbreaking work at the 6th Africa International Biomedical and Biotechnology Conference (AIBBC) held in Naivasha Kenya. Our research stood out and our poster presentation clinched the 1st runners up prize! This recognition is a testament to the significance and innovation embedded in our approach. So, what's the big takeaway? Mount Kenya University isn't just a place for textbooks and lectures; we're on the frontline of future epidemics, armed with swabs, a sense of humor, and the innovative prowess of the Center for Research in Infectious Diseases at the Institute of Tropical Diseases. Our wastewater surveillance isn't just about detecting viruses; it's about predicting, preparing, and maybe adding a sprinkle of fun to the serious business of public health.

As we ride the wastewater wave, let's remember – the next epidemic might just be a flush away, but with Mount Kenya University leading the charge, we're ready to face it headon. Cheers to Mount Kenya University where science is made fun, relatable and more importantly, impactful. So, here's to our scientists, our community, and a healthier tomorrow! Stay curious, Kenya! The future might just be flowing through your pipes.

G. Erasmus Plus Grant (2023)

The University of St. Cyril and Methodius in Trnava (Slovakia) and Mount Kenya University won Erasmus Plus mobility grant (Ref: AK 171) for both faculty members and postgraduate students. The project will cover twenty mobilities between the two institutions for a period of 2 years (2023-2025). MKU team led by Dr Serah Kimaru (Dean School of Social Sciences), Dr Judy Mwangi (Lecturer of the School of Social Sciences) and Mr Bonface Joel Malala (Head, Grants Office) visited UCM from 25th September to 8th October 2023 for the first faculty exchange program. The aim of the visit was to plan on implementation of the Erasmus Plus mobility project. During their visit to UCM, the MKU team benchmarked with UCM faculties/departments including; Faculty of Arts, Faculty of Health Sciences, Faculty of Social Sciences, and Erasmus Plus Grant coordination department.



MKU team paid a courtesy call to the UCM rector – From left: Mr Bonface Jole Malala & Dr Serah Kimaru (MKU), Prof. Mgr. Katarina Slobodova Novakova (Rector, UCM), Dr Judy Mwangi (MKU) and Dr Pavel Miskarik (UCM)



MKU team visited the UCM Faculty of Health Sciences located Piestany City which offers Physiotherapy and Radiological Technology.



MKU team being taken through automated Physiotherapy machine used for learning.

H. Student Training For Entrepreneurial Promotion (Step) Programme

a) STEP Programme in Uasin Gishu County

In collaboration with KNATCOM, KU and Uasin Gichu County, two hundred youths were selected and trained on entrepreneurship skills using STEP programme. STEP trainers drawn from MKU and KU trained youth on the 12 module programme. MKU team was coordinated by Mr Bonface Joel Malala and Prof. Peter Wanderi. Successful trainees were awarded certificates of merit.

b) STEP programme for recovering post-rehabilitation alcohol addicts (The Emmanuel Youth Group, Undulate sub-County, Murang'a County)

Mount Kenya University in collaboration with Emmanuel Catholic Church joined efforts to help youth recovering from alcoholism by offering STEP programme which aimed at boosting their mindset on business opportunities. The Emmanuel Youth Group was established by Sister Mary of The Emmanuel Catholic Church, Agata where she targeted youth addicted to alcoholism within church neighborhood. Mr Bonface Joel Malala and Prof. Peter Wanderi coordinated the programme and delivered 2 STEP module each to youth.



Emmanuel youth Group members pose for a group photo after learning STEP programme Module 2 delivered by Mr Bonface Joel Malala

I. Giz Project on Empowering Youth on Poultry Production and Value Chain

Youth from Siaya, Kisumu, Kakamega, Vihiga and Bungoma Counties were sponsored by the GIZ on poultry production and value chain empowerment. The project aimed to capacity-build 3,800 youth across from 5 counties on poultry production and its value chain in order to create employment opportunities as well as generate income. Mr Bonface Joel Malala who was funded by GIZ through a consultancy bid participated as the project coordinator for the 5 Counties.



Poultry production experts drawn from Kakamega, Bungoma, Kisumu, Vihiga and Siaya Counties during a TOT training at Bungoma Guest Hotel for a 3-day workshop on poultry production and value chain. Mr Bonface Joel Malala is promoting entrepreneurial ventures among the youth in Kakamega County on key areas such as poultry production and value chain.

J. MKU Don Feted During The 5th World Chemicals Conference In Bonn, Germany

Donatus Njoroge a Mount Kenya University Faculty and the Head, Innovations, Intellectual Property and Community Engagement bagged an award during the recently concluded 5th session of the International Conference on Chemicals Management (ICCM5), which was organized by UNEP and hosted by the government of Germany at the World Conference Center Bonn (WCCB).

In a fiercely competitive arena featuring 113 innovations from across the globe, his Project Molepse BioResources emerged the Innovation Challenge winner 2023 .This hard-fought challenge spanned 12 months and attracted a staggering 182 applications from around the world, out of which 113 promising were shortlisted ultimately. The culmination of this endeavour saw 8 remarkable innovations like Bioweg (Germany), Neptunus Biotech (Mexico), Ashaya, (India), Alkyl Recycling, (Netherlands), Zila BioWorks,(USA), Materials in Works, (Malaysia), and NatuPla,(Colombia), Schutzen (India) including Molepse BioResources, presenting their innovations alongside at the ICCM5 World Chemical Conference.

His innovation - Dudukit is a multi-target nano-bio formulation to protect stored grains against insect pest attack. The kit is inserted in the storage bag after breaking the seal saving on labour, increasing net-income for farmers while protecting the environment. Following presentation to an international jury of expert, and investors the project emerged the prize winner in the category “special impact” which includes a grant prize of 5000 € and customized support at the German based Global Start-up Service. This achievement underscores the university’s commitment to research and finding solutions for the world's most pressing issues .



MKU RESEARCH AND INNOVATION OUTLOOK



As we usher in 2024, we are oblivious of the mandate that research plays in ensuring that higher education institutions become relevant by being solution creators to socio-economic and political challenges. Through University Management Support, we have put in place issue-based strategies that assure our students a one-stop shop for their postgraduate journey and training, while ensuring increased staff participation in research so as to drive output and community support a notch higher. These includes;

- ***Setting multidisciplinary publication targets in top leading indexed journals.***
- ***Setting targets for all teaching staff and facilitating multidisciplinary research activities across all campuses.***
- ***Recognition and Award for top researchers, publication and community impact/support.***
- ***Increasing research funding and award to KES. 200 million.***
- ***Encouraging multi-institutional research and publication collaboration.***
- ***Engaging relevant stakeholders in collaborative research and innovation endeavours.***
- ***Campus Research & Innovation workshops.***

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Mount Kenya University



ENROLL NOW IN ANY OF THE FOLLOWING SCHOOLS

Annual Intakes: January, May and September

Mount Kenya University (MKU) a Chartered, ISO 9001:2015 certified University, is committed to offering holistic education and promoting a robust research culture. The University, a practitioner of the internationalization of higher education, has campuses in Kenya and Rwanda, and a vibrant online platform. The University's academic programmes are innovative and responsive to national and international scientific and technological needs. MKU offers medical, health and applied science programmes as well as liberal arts. It actualizes opportunities for personal enrichment, professional preparedness and scholarly advancement.

SCHOOL OF LAW

- Master of laws (LLM)
- Bachelor of laws (LLB)
- Diploma in law

MEDICAL SCHOOL

- Doctor of Philosophy in Medical Laboratory Sciences
- Master of Science in Medical Laboratory Sciences
- Bachelor of Medicine and Bachelor of Surgery (MB ChB)
- BSc. Dental Technology
- BSc. Oral Health
- BSc. Medical Laboratory Sciences
- Diploma in Dental Technology
- Diploma in Community Oral Health

SCHOOL OF PHARMACY

- Bachelor of Pharmacy
- Diploma in Pharmaceutical Technology

SCHOOL OF CLINICAL MEDICINE

- Master of Clinical Medicine
- BSc. In Clinical Medicine and Community Health
- BSc. Health Records and Information Management
- Diploma/ Certificate in Health Records and Information Technology

SCHOOL OF NURSING

- PhD Nursing
- Master of Science in Nursing
- BSc. Nursing

SCHOOL OF PUBLIC HEALTH

- PhD Public Health
- Master of Science in Nutrition and Dietetics
- Master of Public Health
- Master of Health Systems Management
- Master of Science in Community Health
- Master of Science in Health Education and Promotion
- Master of Science in Food Science and Safety
- Bachelor of Public Health
- BSc. Nutrition and Dietetics
- BSc. Food Science and processing
- BSc. Health Systems Management
- BSc. Community Health
- BSc. Health Education and Promotion
- Diploma/ Certificate in Nutrition and Dietetics
- Diploma in Food Science and processing Technology
- Diploma/ Certificate in Community Health

SCHOOL OF BUSINESS AND ECONOMICS

- PhD Business Administration and Management
- MSc. in Procurement and Supplies Management

- MSc. in Project Planning and Management
- Master of Arts in Public Administration and Management
- Master of Arts in Economics
- Master of Business Administration
- Postgraduate Diploma in Project Planning and Management
- Bachelor of Business Management
- Bachelor of Procurement
- Bachelor of Arts in Public Administration
- Bachelor of Office Management and Administration
- Bachelor of Science in Economics
- Bachelor of Science in Economics and Statistics
- Bachelor of Science in Finance and Statistics
- Bachelor of Economics
- Bachelor of Commerce
- Diploma/ Certificate in Human Resource Management
- Diploma/ Certificate in Business Management
- Diploma in Maritime Transport Logistics
- Certificate in Maritime Transport Logistics
- Diploma/ Certificate in Supplies and Procurement Management
- Diploma in Project Management
- Diploma/ Certificate in Banking & Finance

SCHOOL OF COMPUTING AND INFORMATICS

- MSc. in Information Security (Cyber Crime)
- MSc. in Information Science
- MSc. in Information Technology
- BSc. Information Technology
- BSc. Information Science
- Bachelor of Business Information Technology
- Diploma in Information Technology
- Diploma in Computer Science
- Diploma/ Certificate in Business Information Technology

SCHOOL OF EDUCATION

- Doctor of Philosophy in Education
- Doctor of Philosophy in Early Childhood Studies
- Master of Education
- Master of Education in Special Needs Education
- Master of Education (Early Childhood Studies)
- Postgraduate Diploma in Education [PGDE]
- Bachelor of Education [Science]
- Bachelor of Education [Arts]
- Bachelor of Education in Primary Education
- Bachelor of Education in Special Needs [Primary Education]
- Bachelor of Education in Special Needs [Secondary Education]
- Bachelor of Education in Early Childhood Studies
- Diploma in Special Needs Education
- Diploma in Early Childhood Studies

SCHOOL OF ENGINEERING, ENERGY AND BUILT ENVIRONMENT

- MSc. Renewable Energy and Environmental Engineering
- BSc. in Energy and Environmental Technology

- Bachelor of Science in Petroleum Exploration and Production
- BSc. Real Estate Management
- Bachelor of Technology in Computer and Electronic Systems
- Diploma in Electrical and Electronics Engineering
- Diploma in Medical Engineering

SCHOOL OF SOCIAL SCIENCES

- PhD in Counseling Psychology
- PhD in Development Studies
- PhD in Sociology
- Master of Arts in Development Studies
- Master of Arts in Monitoring and Evaluation
- Master of Arts in International Relations and Diplomacy
- Master of Arts in Security Studies and Criminology
- Master of Arts in Governance and Ethics
- Master of Arts in Journalism and Media Studies;
- Bachelor of Arts in International Relations and Diplomacy
- Bachelor of Arts in Development Studies
- Bachelor of Arts in Community Development
- Bachelor of Arts in Sociology
- Bachelor of Social Work and Administration
- Bachelor of Arts in Security Studies and Criminology
- Bachelor of Arts in Peace Studies and Conflict Resolution
- Bachelor of Arts in Public Administration and Governance
- Bachelor of Arts in Justice and Security Studies
- Bachelor of Counselling Psychology
- Bachelor of Arts in Film and Animation Studies
- Bachelor of Arts in Mass Media and Communication
- Diploma/ Certificate in Community Development and Social work
- Diploma in counselling Psychology
- Diploma / Certificate in Journalism and Mass Communication
- Diploma / Certificate in Public Relations and Diplomacy
- Diploma / Certificate in Security Studies and Criminology
- Diploma in County Governance and Administration

SCHOOL OF HOSPITALITY, TRAVEL AND TOURISM MANAGEMENT

- MSc. in Hospitality Management
- BSc. in Hospitality Management
- BSc. in Travel and Tourism Management
- Diploma in Hospitality Management
- Diploma in Travel and Tourism Management

- Diploma in Culinary Arts
- Certificate in Food Production
- Certificate in Travel and Tourism Operations

SCHOOL OF PURE AND APPLIED SCIENCES

- PhD in Applied Entomology
- PhD in Ecology
- PhD in Zoology/Botany
- PhD in Conservation Biology
- PhD in Molecular Biology
- PhD in Chemistry
- PhD in Natural Products Chemistry
- PhD in Immunology
- MSc. in Chemistry
- MSc. in Statistics
- MSc. in Applied Entomology
- MSc. [Ecology and Conservation Biology]
- MSc. [Biotechnology]
- BSc. in Biotechnology
- BSc. in Applied Biology
- BSc. in Environmental Science
- BSc. in Laboratory Technology
- BSc. in Industrial Chemistry
- BSc. in Statistics
- BSc. in Actuarial Sciences
- BSc. in Animal Health & Production
- BSc. in Agriculture & Rural Development
- BSc. in Animal Science
- Diploma/ Certificate in Animal Health & Production
- Certificate in Artificial Insemination



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