



THE TECHNICAL UNIVERSITY OF KENYA

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School:	Biological and Life Sciences
Department:	Biochemistry and Biotechnology
Current Designation:	Tutorial Fellow, DEPARTMENT OF BIOLOGICAL AND LIFE SCIENCES
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Consultation Hours:	8AM-5PM MON - FRI



EDUCATION

LEVEL	QUALIFICATION NAME	INSTITUTION	YEAR
Doctor of Philosophy (PhD)	BIO CHEMISTRY	HANNOVER MEDICAL SCHOOL(Germany)	2020
Masters of Science (M.Sc.)	BIOCHEMISTRY	UNIVERSITY OF NAIROBI(Kenya)	2014
Bachelor of Science (BSc)	BIOCHEMISTRY	UNIVERSITY OF NAIROBI(Kenya)	2009
O level/Equivalent	KENYA CERTIFICATE OF SECONDARY EDUCATION	KERUGOYA BOYS HIGH SCHOOL(Kenya)	2003
KCPE/Equivalent	KENYA CERTIFICATE OF PRIMARY EDUCATION	RIANDIRA PRIMARY SCHOOL(Kenya)	1999

WORK EXPERIENCE

PERIOD	INSTITUTION	POSITION
NOVEMBER 2015 - TO DATE	TECHNICAL UNIVERSITY OF KENYA	TUTORIAL FELLOW
JANUARY 2014 - OCTOBER 2015	UNIVERSITY OF NAIROBI	GRADUATE ASSISTANT
SEPTEMBER 2013 - OCTOBER 2015	TECHNICAL UNIVERSITY OF KENYA	PART TIME LECTURER
JANUARY 2011 - FEBRUARY 2011	INSTITUTE OF PRIMATE RESEARCH (IPR)	INTERM
OCTOBER 2016 - DECEMBER 2020	HELMHOLTZ CENTER FOR INFECTION RESEARCH (HZI)	DOCTORAL RESEARCHER
JANUARY 2010 - DECEMBER 2010	TNS RESEARCH & MARKETING SERVICES LTD (RMS)	RESEARCH ASSISTANT
MARCH-2011 - AUGUST 2011	OMAERA PHAMACEUTICALS LTD.	MEDICAL REPRESENTATIVE
FEBRUARY 2021 - APRIL 2023	HELMHOLTZ CENTER FOR INFECTION RESEARCH (HZI)	POSTDOCTORAL RESEARCHER

GENERAL STATEMENT ON RESEARCH AREAS

I am a biochemist specializing in Virology, Immunology, and Antimicrobial Drug Discovery. I offer technical expertise and consultation in the following topics: Basic Biochemistry, Immunological Techniques, Tissue Culture Methods, Virology Techniques, Animal Handling, Polymerase Chain Reaction (PCR) Amplification of Nucleic Acids and Sequencing, Molecular Cloning, and High-Throughput Screening Methodologies for Drug Discovery.

CURRENT RESEARCH PROJECTS

Immune Escape of T-Cell Recognition by Murine Cytomegalovirus	Viral Immunology
High-throughput screening-based discovery of small molecules against Chikungunya virus infection	Drug Discovery
Medicinal Chemistry Call 2022	Drug Discovery
Antimicrobial Screening	Drug Discovery
Track Screen Innovate (TSI) approach to One Health: A Focus on Antimicrobial Resistance Campaign in Kenya.	Drug Discovery

SELECTED PUBLICATIONS

TITLE	LINK TO PUBLICATION	YEAR
Serotype Diversity of Respiratory Human Adenoviruses amongst Pediatric Patients from Western Kenya, 2010-2012	View online	
Immune Escape of T-cell Recognition by Murine Cytomegalovirus	View online	
Synthesis and Bioactivity of Thiocarboxylic A and Derivatives	View online	
Syntheses and Antibacterial Evaluation of New Penicillium Metabolites Gregatins G and Thiocarboxylics C	View online	

POSTGRADUATE STUDENTS SUPERVISION

NAME	PROJECT TITLE	PERIOD
Mbelesia Lovias Muhadia; SBBQ/00118/2020	Surveillance of Antibiotic-resistant Bacteria Strains from Wastewater Systems in Nairobi City County. (Undergraduate Thesis 2024)	September 2023 - April 2024
Jerry Junior Okoth; SBBQ/00139/2020	Antibacterial Activity of Myrsine Africana and Tithonia Diversifolia Leaf Extracts against Select Gram-positive and Gram-negative Pathogenic Bacteria. (Undergraduate Thesis 2024)	September 2023 - April 2024
Lucy Akinyi Ndiga; SBBQ/O2276/2020	Antifungal Effects of Strychnos henningsii Leaf and Bark Extracts against Grey Mold Botrytis cinerea. (Undergraduate Thesis 2024)	September 2023 - April 2024
David Mugo Muturi; SBBM/00128/2021	Exploitation of Phytochemicals from Launea cornuta (bitter lettuce) to Mitigate the Spread of Antibiotic Resistance in Poultry Farming	September 2024 - July 2025
David Mugo Muturi; SBBM/00128/2021	Exploitation of Phytochemicals from Launea cornuta (bitter lettuce) to Mitigate the Spread of Antibiotic Resistance in Poultry Farming (Undergraduate Thesis 2025)	September 2024 - July 2025
Munga Priscilla Nduta; SBBM/00124/2021	Comparative Analysis of Antibiotic-Resistant Bacterial Strains in Commercial and Traditional Poultry Farms in Kiambu County (Undergraduate Thesis 2025)	September 2024 - July 2025
Leslie Waweru Kimani; SBBI/00905/2021	Assessment of the Antimicrobial Effectiveness of Carica Papaya Extracts Against Bacterial Strains in Poultry (Undergraduate Thesis 2025)	September 2024 - July 2025

COURSES TAUGHT

NAME	DESCRIPTION	PERIOD
SBBQ 2107: Biochemistry of Microorganisms	The course SBBQ 2107: Biochemistry of Microorganisms provides students with knowledge on microbial metabolic diversity and commercial biosynthesis processes. It covers microbial nutrition, fermentation, respiration, and the oxidation of hydrocarbons, carbon substrates, and sulfur compounds. Through various learning methods, students gain a comprehensive understanding of microbial biochemistry and its applications.	Semester I (September - December) - TO-DATE
SBBI 2205: Virology and Mycology	This course provides an in-depth exploration of virology and mycology, focusing on the classification, characteristics, and replication of viruses and fungi. Students will learn about common viral and fungal diseases, including their modes of transmission, prevention, and control. The course also covers laboratory techniques essential for the diagnosis and study of these microorganisms, such as equipment preparation, culture media preparation, isolation, and microscopic observation. Practical	Semester II (January - April) - TO-DATE
SBBU 7201: Principles of Forensic Genetics & SBBU 7205: Advanced Forensic Genetics	The Forensic Genetics course covers essential topics such as the collection and preservation of biological evidence, DNA isolation and quantitation, PCR amplification, DNA fingerprinting, and the analysis of short tandem repeats (STRs). Students will also learn about the Combined DNA Index System (CODIS), paternity testing, and the forensic applications of SNPs and Y chromosome polymorphisms. The course prepares students for careers in forensic science and related fields.	Semester II (January - April) - TO-DATE
SBBU 7204: Principles of Biotechnology	The course Principles of Biotechnology (SBBU 7204) provides students with advanced knowledge of biotechnological techniques and their applications, including DNA/RNA extraction, recombinant DNA technology, and genetic engineering in various organisms. It also addresses the ethical and social implications of genetic engineering. The course equips students with knowledge of innovative uses of organisms and how to manipulate them to produce useful products.	Semester II (January - April) - TO-DATE
SSFI 2208: BIOCHEMISTRY	This course, BIOCHEMISTRY II (SSFI 2208), builds on Biochemistry I (SSFI 2101) and covers topics such as nutrient functions, enzyme dynamics, bioenergetics, photosynthesis, metabolism, molecular biology, gene expression regulation, and hormones. Through lectures, assignments, and practical sessions, students will gain a solid understanding of these biochemical processes and their relevance to food science and technology.	Semester II (January - April) - TO-DATE
SSFI 2101: BIOCHEMISTRY I	The course SSFI 2101 Biochemistry offers an introduction to the fundamental concepts of biochemistry, focusing on the molecular components of cells and the structure and functions of biomembranes. It covers the structure, properties, and functions of essential biomolecules such as water, carbohydrates, lipids, proteins, nucleic acids, vitamins, and minerals.	Semester I (September - December) - TO-DATE
SSAI 4221: CYTOGENETICS TECHNIQUES	This course offers an overview of cytogenetics, emphasizing chromosomes and their genetic roles. It covers cell and molecular biology, DNA components, chromosome analysis, karyotyping, chromosomal abnormalities, and cancer genetics. Students will learn to apply cytogenetic techniques in research and clinical settings, including using microscopes, preparing and staining chromosomes, creating karyotypes, detecting DNA sequences with FISH, and analyzing genetic mutations related to cancer.	Semester II (January - April) - TO-DATE
SBBQ 2102 & SSAF 1202: General Microbiology	SBBQ 2102 General Microbiology introduces students to the fundamental principles of microbiology, covering laboratory safety, sterilization, specimen preparation, cultivation of microorganisms, bacteriology, mycology, and virology. Students will learn to handle specimens, use microscopic methods, control microbial growth, and characterize microorganisms. This course equips students with the knowledge and skills necessary to understand and work effectively with microorganisms.	Semester I (September - December) - TO-DATE

TITLE INSTITUTION

Member	German Society for Immunology (DGfI)
Member	Federation of European Laboratory Animal Science Associations (FELASA)

EXTRA INFORMATION**DESCRIPTION****Oral Presentations**

- Lecture on 19th April 2023: Biological Profiling of Fungal Metabolites for Antiviral Effects against Chikungunya Virus Infection. Workshop organized by Dr. Miroslav Kolarik - Institute of Microbiology of the CAS, Laboratory of Fungal Genetics and Metabolism Videnska 1083142 00 Praha 4 Czech Republic.
- Presentation on 23rd July 2019: CMV Immune Escape Drives Poor Long-Term Protection upon Experimental Adoptive Immunotherapy in Mice, during the 44th International Herpesvirus Workshop (IHW 2019), Knoxville Tennessee, USA
- Presentation on 9th January 2019: CMV Immune Escape Drives Poor Long-Term Protection upon Experimental Adoptive Immunotherapy in Mice, during the 5th Chronic Virus Infections (CVI) Workshop, Helmholtz Centre for Infection Research (HZI), Braunschweig, Germany
- Presentation on 5th October 2018: Ephemeral immune control of CMV infection in TCR transgenic mice recognizing a single viral epitope, during the Mini-herpes Virus Workshop, Heinrich Pette Institute Hamburg, Germany
- Presentation 2nd -5th September 2018: Ephemeral immune control of CMV infection in TCR transgenic mice recognizing a single viral epitope, during the European Congress on Immunology Conference (ECI 2018) Amsterdam, Netherlands

Poster Presentations

- International Helmholtz Drug Discovery Conference (HDDC) 2023 held on 15th to 16th May 2023, Helmholtz Centre for Infection Research (HZI), Braunschweig, Germany. Fredrick Mbui, Gemma Vilaro Perez, Mark Brönstrup, Juana Maria Diez Anton and Ursula Bilitewski. High-throughput screening-based Discovery of Inhibitors of Chikungunya Virus from the EU-OPENSREEN Compounds Library based on the Detection of Cytopathic Effects.
- Deutsches Zentrum für Infektionsforschung (DZIF) 6th Translation School held on 7th-9th November 2018 in Lübeck, Germany, Fredrick Mbui, Lorenz Mihatsch, Lisa Borkner, Zeeshan Chaudhry, Iryna Dekhtiarenko, Robert Geffers, Florian Voit, Kilian Schober, Veit Buchholz, Luka Čičin-Šain. Ephemeral immune control of CMV infection in TCR transgenic mice recognizing a single viral epitope.
- Deutsche Gesellschaft Für Immunologie (DGfI) 14th Spring School on Immunology held on 18th-23rd March 2018 in Ettal-Bavaria, Germany. Fredrick Mbui, Lorenz Mihatsch, Lisa Borkner, Zeeshan Chaudhry, Iryna Dekhtiarenko, Robert Geffers, Florian Voit, Kilian Schober, Veit Buchholz, Luka Čičin-Šain. Ephemeral immune control of CMV infection in TCR transgenic mice recognizing a single viral epitope.
- 27th Annual Meeting of the Society for Virology held on 22nd -25th March 2017 in Marburg, Germany- Philipps-Universität Marburg, Germany. Fredrick Mbui, Lorenz Mihatsch, Lisa Borkner, Zeeshan Chaudhry, Iryna Dekhtiarenko, Robert Geffers, Florian Voit, Kilian Schober, Veit Buchholz, Luka Čičin-Šain. Ephemeral immune control of CMV infection in TCR transgenic mice recognizing a single viral epitope.