

## Brenda Wanjiru Muriithi

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## EDUCATION

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*Masters of Science: Molecular Biology and Bioinformatics*

*June 2026*

Jomo Kenyatta University of Agriculture and Technology, Juja, Kenya

*Bachelor of Technology: Biotechnology*

*Dec 2018*

Technical University of Kenya, Nairobi, Kenya.

## RESEARCH AND DEVELOPMENT EXPERIENCE

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*Intern*

*Jan 2024 - Current*

*Jomo Kenyatta University of Agriculture and Technology (JKUAT)*

Established in vivo activity profiles of anti-malarial drugs; amodiaquine, lumefantrine, and piperaquine in previously selected drug-resistant *Plasmodium berghei* ANKA, Extraction of DNA and RNA, *Plasmodium berghei* culture, Restriction Digests, PCR analysis, Electrophoresis, Reverse Genetics.

*Student Volunteer*

*Nov 2020 – Feb 2022*

*Kenya Medical Research Institute (KEMRI)*

Established in vivo activity profiles of antimalarial drugs; amodiaquine, lumefantrine, and piperaquine in previously selected drug-resistant *Plasmodium berghei* ANKA, Extraction of DNA and RNA, *Plasmodium berghei* culture, Restriction Digests, PCR analysis, Electrophoresis, Reverse Genetics.

## OTHER SKILLS AND COMPETENCES

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- Molecular Biology Expertise: DNA, RNA, and protein analysis, gene expression regulation, and genetic engineering techniques.
- Data Analysis and Visualization: Strong skills in analyzing and interpreting molecular biology data using R and Python. Ability to perform statistical analysis and create visualizations
- Programming Skills: Mastery of R and Python programming languages, with the capability to develop custom scripts and pipelines for automating data analysis workflows
- Experimental Design and Execution: Proficiency in designing and conducting molecular biology experiments, ensuring accuracy, reproducibility, and adherence to best practices.
- Bioinformatics Proficiency: Knowledge of bioinformatics tools and databases.
- Communication Skills: Excellent verbal and written communication skills. Ability to communicate complex scientific concepts to diverse audiences.

## PUBLICATIONS

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### *Journal Papers Accepted*

Gachie, B., Thiong'o, K., **Muriithi, B.**, Chepnetich, J., Onchieku, N., Gathirwa, J., Mwitari, P., Magoma, G., Kiboi, D., & Kimani, F., "Prevalence of mutations in the cysteine desulfurase IscS (Pfnfs1) gene in recurrent *Plasmodium falciparum* infections following artemether-lumefantrine (AL) and dihydroartemisinin-piperaquine (DP) treatment in Matayos, Western Kenya," *Malaria Journal*, 2023, **22**:158, <https://doi.org/10.1186/s12936-023-04587-2>.

Chepnetich, J., **Muriithi, B.**, Gachie, B., Thiong'o, K., Jepkorir, M., Gathirwa, J., Kimani, F., Mwitari, P., & Kiboi, D., "Amodiaquine drug pressure selects nonsynonymous mutations in pantothenate kinase 1, diacylglycerol kinase, and phosphatidylinositol-4 kinase in *Plasmodium berghei* ANKA," *Open Research Africa*, 2023, **5**:28, <https://doi.org/10.12688/openresafrica.13436.3>.

**Muriithi, B.W.**, Chepnetich, J., Gachie, B., Thiong'o, K., et al., "Structural and functional implications of MIT2 and NT2 mutations in amodiaquine and piperaquine resistant *Plasmodium berghei* parasites," *Experimental Parasitology*, 2025, **271**:108923, <https://doi.org/10.1016/j.exppara.2025.108923>.

### **Journal Papers in Review**

Gachie, B., et al., "Lumefantrine pressure selects nonsynonymous mutation in cysteine desulfurase IscS gene in the rodent malaria parasite *Plasmodium berghei* ANKA," *Malaria Journal*, 2024.

Kiboi, D., **Muriithi, B.**, "Structural and Functional Impact of the G340S Mutation in *Plasmodium falciparum* Ferredoxin NADP<sup>+</sup> Reductase: In silico Analysis and Molecular Docking," *Verixiv*, 2025, DOI: 10.12688/verixiv.2019.1

### **Conference Papers**

**Muriithi, B.W.**, Chepnetich, J., Gachie, B., Thiong'o, K., et al., "Structural and functional implications of MIT2 and NT2 mutations in amodiaquine and piperaquine resistant *Plasmodium berghei* parasites," *Experimental Parasitology*, 2025, **271**:108923, <https://doi.org/10.1016/j.exppara.2025.108923>.

### **HONOURS AND AWARDS**

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1. *Travel Award* 2024  
Awarded a travel grant to attend and present an abstract at the Multilateral Initiative on Malaria (MIM) Conference.
2. *Travel Bursary* 2024  
Received a Bill & Melinda Gates Foundation travel bursary to present research at the Genomics Epidemiology of Malaria (GEM 2024) Conference.
3. *Research Grant* 2021  
Awarded a research grant from Japan International Cooperation Agency (JICA) to support MSc research.

### **PRESENTATIONS AND INVITED LECTURES**

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**Paper Presentation:** "Structural and Functional Implications of MIT2 and NT2 Mutations in Amodiaquine and Piperaquine Resistant *Plasmodium berghei* Parasites," Multilateral Initiative on Malaria (MIM) Conference, April, 2024.

**Paper Presentation:** "Structural and Functional Implications of MIT2 and NT2 Mutations in Amodiaquine and Piperaquine Resistant *Plasmodium berghei* Parasites," Genomics Epidemiology of Malaria (GEM) Conference, September 2024.

### **PROFESSIONAL DEVELOPMENT TRAINING**

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- Training Oxford Nanopore data analysis During the African BioGenome Project (AfricaBP) Open Institute for Genomics and Bioinformatics Regional Workshop on Building a Sustainable Future for Biodiversity Genomics and Bioinformatics in East and Central Africa, International Livestock Research Institute (ILRI), Nairobi, Kenya, 2023.
- Training Data Clinic Series: Introduction to Basic R statistics, Jomo Kenyatta University of Agriculture and Technology, 2024.

- Training MalariaGEN-PAMCA data analysis for genomic surveillance of African malaria vectors, Wellcome Sanger Institute, 2024.
- Training\_H3AbioNeT-IBT, International Centre of Insect Physiology (ICIPE), 2024.

## **PROFESSIONAL AFFILIATIONS**

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The Organization for Women in Science for the Developing World (OSWD), Member.

## **COMMUNITY SERVICE**

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**Mentorship & Training:** Mentored undergraduate and early-career students in molecular biology and bioinformatics techniques, including PCR, sequence analysis, and data visualization using R and Python.

## **ORGANIZATION**

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Jomo Kenyatta University of Agriculture and Technology (JKUAT)

Student (MSc Molecular Biology & Bioinformatics)

Location: Juja, Kenya

Duties:

- Conducting MSc research in molecular biology and bioinformatics focused on *Plasmodium* drug resistance and genomics.
- Performing DNA/RNA extraction, PCR, electrophoresis, and reverse genetics.
- Carrying out bioinformatics analyses using R, Python, and Linux for sequence alignment, variant analysis, structural modelling, and population genomics.
- Preparing scientific manuscripts, reports, and presentations for conferences and publications.

## **LANGUAGES**

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**English:** Native Language, Distinguished Listener, Superior Speaker, Superior Reading and Writing

## **REFERENCES**

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1. Dr. Daniel Muthui Kiboi,  
Lecturer  
Jomo Kenyatta University of Agriculture and Technology  
P.O Box 62000-00200, Nairobi, Kenya  
Tel: +254(0)721 249 977  
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2. Mr. Francis Kimani, Research  
Scientist,  
CBRD, Kenya Medical Research Institute  
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Email: fkimani@kemri.go.ke