

## GILBERT KIBET-RONO

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### Career Objective

To seek a deeper scientific understanding of pathogens, hosts and habitats through bioinformatics and computational analysis of big biological and genomic data, and promoting open reproducible scientific research.

### Educational Qualification

**2018 – now: MSc in Bioinformatics and Molecular Biology, Jomo Kenyatta University of Agriculture and Technology (JKUAT), Kenya**

**Thesis title:** Phylogenetic and phylogeographic meta-analysis of cytochrome c oxidase I barcode sequences of African Arthropods submitted into the Barcode of Life Database. The project was based in the International Centre of Insect Physiology and Ecology (*icipe*).

**2011 – 2015: BSc. Biochemistry degree, Kenyatta University, Kenya**

Attained a second class honours division. A in the Industrial Attachment module in a Research Institute.

**2006 – 2009: Kenya Certificate of Secondary Education, Tenwek High School**

Attained A- with an A in Biology, Chemistry, Physics, Mathematics, Geography and Agriculture.

### Research Experience

**August 2020 - now: Research Associate II - International Livestock Research Institute (ILRI).**

I am part of a team working in a **genomics lab** (BSL2 and 3) to test, sequence and analyse microbial, animal and environmental samples. I have been privileged to work on **metagenomic**, **viral** (SARs-CoV-2, MERS, Influenza A, Hepatitis E), **bacterial**, **wastewater** and **single-cell** NGS data. My responsibilities are:

- **Sequencing libraries:** library preparation, sequencing, post-run bioinformatics analysis and sequencing error troubleshooting on **Illumina MiSeq/NextSeq 550, 2000 and ONT platforms**.
- **Data management:** Sample reception and metadata curation; develop/maintain relevant databases.
- **Bioinformatics pipelines:** Develop and maintain fast, scalable and reproducible bioinformatics pipelines for short and long-read sequence data based on **Linux, git, GitHub** and **workflow management engines (Nextflow)**. I have worked on **Shotgun metagenomics** and **AMR gene Identification; Genome assembly, variant calling and annotation; 10X Single-cell analysis; Phylogenomics and phylogeography** for spatio-temporal phylodynamic analysis.
- **Bioinformatics analysis:** Conduct rigorous bioinformatics analysis in a local High-Performance Computing cluster efficiently, based on own or open source tools and pipelines.
- Curation and submission or retrieval of sequence data to/from open databases - NCBI, GISAID
- Conduct **statistical analysis** (R) and **generate publication-ready figures**: graphs, trees, networks.
- Collaboratively draft manuscripts, policy briefs, presentations and reports.
- Develop and conduct short intermediate to advanced courses on bioinformatics.
- Provide guidance and support to fellows on bioinformatics analysis.

I have a good understanding of **molecular laboratory procedures** involved in: manual/automated nucleic acid extraction, purification, amplification and quantification via standard protocols; cDNA synthesis, library preparation, quantification, quality evaluation, loading and sequencing.

I have been trained on **Illumina MiSeq, NextSeq550 and 2000** and **ONT** sequencing by specialists.

### **June 2020 - March 2021: Fellow - Accelerating Science And Publication in Biology (ASAPbio) fellows.**

As part of the fellowship program on preprints I was trained on preprints and gained the skills needed to drive conversations about preprints in life sciences. In the program, we developed collaboratively an openly accessible ten-hour course on “Preprints and publishing in Life Science”.

### **Nov 2018 - 2020: MSc Dissertation Research Internship Programme (DRIP) fellow – International Centre of Insect Physiology and Ecology (icipe), Duduville Campus, Kenya**

Developed a bioinformatics pipeline and conducted intensive data analysis in a High-Performance Computing (HPC) cluster at *icipe*'s Molecular Biology and Bioinformatics Unit. Tasks included;

- Retrieved Arthropod sequence data from GenBank, BOLDSystems (<https://v4.boldsystems.org/>) and GBIF (<https://www.gbif.org/>) through their database APIs.
- Analysis and visualisation of results: taxonomic classification (RDP classifier), multiple sequence alignment (Muscle, Mafft, T-coffee, PASTA, SATE, BMGE, Jalview, SeaView), phylogenetic inference (IQtree, RaxMLng, FastTree, FigTree, Archaeopteryx, Dendroscope) and phylogeographic analysis (PopART, pegas/R, BEAST2). I used Python, R and Bash scripts for data wrangling.
- Developed a bioinformatics workflow in **Bash, R, Python, Nextflow** and other programming languages, hosted on **GitHub** and version-controlled using **Git**.

### **June – Oct 2018: Research Intern - International Centre of Insect Physiology and Ecology (icipe)**

Did an in-depth literature review on my MSc thesis project. Explored various project-related databases, bioinformatics tools, programming languages and use of HPC cluster at *icipe*.

- Participated in an **Open Science workshop, training and hackathon** funded by Mozilla mini-grant.
- Attended an intensive five-week **Residential Training-of-Trainers Bioinformatics course** by the **East African Network for Bioinformatics Training (EANBiT)** from 11<sup>th</sup> June to 13<sup>th</sup> July 2018.

### **June – Aug 2014: Attachment - Kenya Medical Research Institute**

Gained experience in laboratory procedures involved in virology research and molecular epidemiology surveillance for monitoring disease transmission pathways at the **Centre for Virus Research**. I also volunteered for two weeks to clear a backlog of samples in the HIV/AIDS diagnostics laboratory.

- Mastered their procedures and principles of various molecular techniques.
- Participated in the extensive cleaning and routine maintenance of biosafety cabinets, incubators, and autoclaves and completed quality assurance, quality control and biosafety procedures training.
- Received and sorted samples and uploaded sample data onto a laboratory database.
- Processed dried-blood spots and whole-blood samples for HIV viral load analysis.
- Performed real-time qualitative PCR for early infant diagnosis and viral load analysis.
- Processed samples using Abbott m2000sp and Cobas Amblirep/Taqman.

### **Aug – Dec 2013: Attachment - Kenya Medical Research Institute**

Participated in various virology procedures under supervision at the **Centre for Virus Research**; Viral Hepatitis Laboratory, Rotavirus /Electron Microscopy Laboratory, Acute Respiratory Infections (ARI) and Influenza Surveillance Laboratory, HIV/P3 Maximum Containment Laboratory, Polio Surveillance Laboratory, Tissue Culture Laboratory, Human Papillomavirus (HPV) Laboratory and Viral Haemorrhagic Fever (VHF) Laboratory. I did the following:

- Hepatitis Reverse Passive Haemagglutination screening and confirmation tests for Hepatitis.
- Haemagglutination inhibition assays and immunofluorescence assays - Influenza Lab.
- Cultured and preserved cells for growth and isolation of viruses like L20B, RD and HEp2 - VHF lab.
- Processed polio stool samples, inoculated cells and monitored cultures for CPEs.
- DNA extraction, PCR amplification and gel electrophoresis.
- Quantification of nucleic acid concentration using a NanoDrop™ 2000c machine (ng/μL).

- Viral load and early infant diagnosis through RT-qPCR for HIV.
- Sequenced nucleic acid sequences using Sanger sequencing.
- Maintenance of a mosquito insectary at VHF Laboratory.

#### **Teaching/Administrative Experience**

- **March 3 - March 7 2025: Trainer - Africa CDC Training on Wastewater-Based Pathogen Genomics**  
Developed materials and conducted a hands-on training on Wastewater-based Molecular Detection and bioinformatics analysis hosted at ILRI from 3<sup>rd</sup> to 7<sup>th</sup> of March 2025 organised by Africa CDC and ASLM.
- **May 6 - May 17 2024: Trainer - Africa CDC Training on Bioinformatics for Pathogen Genomics**  
Developed course materials and conducted a hands-on training on viral pathogen genome sequencing and bioinformatics analysis hosted at ILRI on 6<sup>th</sup> to 17<sup>th</sup> of May 2024 organised by Africa CDC and ASLM.
- **March 13 - March 24 2023: Trainer - Africa CDC Training on Bioinformatics for Pathogen Genomics**  
Collaboratively developed course materials and conducted an advanced two-week course on pathogen metagenomics hosted at ILRI on 13th to 24th of March 2023 organised by Africa CDC and ASLM.
- **December 11 - December 22 2022: Trainer - WHO-Yemen Training on SARS-CoV-2 Genomics**  
Developed course materials and conducted the training titled “Hands-on Training on SARS-CoV-2 Genomic Sequencing and Bioinformatics Analysis” held at ILRI between 11th and 22nd December 2022. The trainees were Yemeni nationals and funded by WHO.
- **August - September 2022: Trainer - County Genomics SARS-CoV-2 Surveillance Workshop**  
Prepared high-level bioinformatics course materials for two-day training targeted at the front-line officers in 28 counties in Kenya. Conducted at ILRI reaching over 60 Health care workers.
- **March - April 2022: Trainer - Africa CDC PGI Training on Pathogen Genomics**  
Collaboratively developed bioinformatics training material. The workshop titled “SARS-CoV-2 Genome Sequencing and Bioinformatics Analysis Training Workshop” was held at ILRI between 28th March and 8th April 2022 and funded by Africa Centre for Disease Control Pathogen Genomics Initiative.
- **August – October 2019: Volunteer Teaching Assistant - *icipe***  
Assisted in implementing a three-month **Intermediate Bioinformatics 16sRNA Training** (Int\_BT\_2019) by **H3Africa Bioinformatics Network (H3ABioNet)** at *icipe* node.
- **June – Oct 2018: Volunteer Teaching Assistant - *icipe***  
Facilitated and implemented the third iteration of a three-month **Introduction to Bioinformatics Training (IBT2018)**, by **H3Africa Bioinformatics Network (H3ABioNet)** at *icipe* node.
- **September 2017 – May 2019: Part-time Teaching Assistant - JKUAT**  
Conducted tutorials, experiments, supervised assignments and assessment tests for undergraduate students in the Department of Biochemistry for different modules.

#### **Membership and Affiliations.**

- A member of the **International Society for Computational Biology (ISCB)**, through the **African Society of Bioinformatics and Computational Biology (ASBCB)**.
- Formerly affiliated with **H3ABioNet** through the *icipe* training node membership. Participated in facilitating Bioinformatics Training courses and workshops at *icipe*.
- Affiliated with **#OpenScienceKE open science project**, a project aimed at promoting open science and bioinformatics in Kenya.
- Member of **Bioinformatics Hub of Kenya**, a young career researchers initiative to boost and support bioinformatics learning in Kenya. I have been privileged to train, guide and support.

### Skills.

Omics: Genomics, Metagenomics, Phylogenomics, Proteomics, Data wrangling and Visualization.  
IT: Linux, LibreOffice, Chromium, Zotero, Mendeley, Windows and Microsoft Office Suites.  
Programming: Bash, Awk, R, Python, Nextflow, Git and GitHub, StackOverflow, Active Collab, Slack.  
Languages: Fluent in spoken and written English and Swahili.  
First Aid: Certified First Aider by Dataline International Limited.

### Interests.

Machine Learning: I am an avid consumer of machine learning techniques in bioinformatics.  
Open Science: Enthusiastic about organising, training and facilitating open science events.  
Reading: An ardent reader of scientific articles and novels.  
Fruit/tree gardening: I maintain a parcel of land dedicated to planting flowers, fruits and trees.

### Conferences and Training Attendances.

- **2024 Advanced Training on Developing Bioinformatics Workflows** at KEMRI-Wellcome Trust Research Programme in May 2024 organised by the **NGS Academy and the Africa Pathogen Genomics Initiative** and funded by the Bill & Melinda Gates Foundation.
- **2023 Advanced Training on Developing Bioinformatics Workflows** at KEMRI-Wellcome Trust Research Programme in March 2023 organised by the **NGS Academy and the Africa Pathogen Genomics Initiative** and funded by the Bill & Melinda Gates Foundation.
- **2022 Advanced Training on Developing Bioinformatics Workflows** at KEMRI-Wellcome Trust Research Programme from the 25th to the 29th of April 2022 organised by the **NGS Academy and the Africa Pathogen Genomics Initiative** and funded by the Bill & Melinda Gates Foundation.
- **Oral Presentation on my MSc thesis** at the **International Society for Computational Biology (ISCB) Africa Society of Bioinformatics and Computational Biology (ASBCB) Conference** on Bioinformatics at Kwame Nkrumah University of Science and Technology, Kumasi, Ghana on 13th of November 2019
- **Oral presentation on my MSc thesis** at the third **ISCB Africa Student Council Symposium (SCS)** at Kwame Nkrumah University of Science and Technology, Kumasi, Ghana on 11th of November 2019
- **Scientific writing paper training workshop** conducted by the African Population and Health Research Centre (APHRC), at *icipe* Duduville campus, Nairobi from 4th to 8th November 2019
- MSc project poster presentation at 4<sup>th</sup> **African International Biotechnology and Biomedical Conference (AIBBC)** at Pridelnn Paradise Beach Resort & Spa., Mombasa, Kenya from 28<sup>th</sup> to 30<sup>th</sup> August 2019
- **The CODATA-RDA Research Data Science Advanced Workshop on Bioinformatics** at The Abdus Salam International Centre for Theoretical Physics, Trieste, Italy from 19<sup>th</sup> to 23<sup>rd</sup> August, 2019
- 2018 **#OpenScienceKE workshops, training and hackathon** organised under Kenya Bioinformatics network at the KENET training lab, University of Nairobi, Kenya from 9th to 10th August, 2018.
- 2018 **Residential Bioinformatics Training Course** by the **East African Network for Bioinformatics Training (EANBiT)** conducted at *icipe*, Nairobi, KEMRI Wellcome Trust and Pwani University Kilifi from 11<sup>th</sup> June to 13<sup>th</sup> July, 2018.
- 2017 **VectorBase and Vector Genomics Workshop** at *icipe*, Duduville campus, Nairobi, Kenya from 18<sup>th</sup> to 22<sup>nd</sup> September, 2017.
- 3<sup>rd</sup> **Africa International Biotechnology & Biomedical Conference (AIBBC)** at Sino-Africa Joint Research Centre, JKUAT, Kenya from 14<sup>th</sup> to 15<sup>th</sup> September, 2017
- **In situ proximity and Ligation Assay course** organised by **AIBBC** at Sino-Africa Joint Research Centre, JKUAT, Kenya from 12<sup>th</sup> to 13<sup>th</sup> September, 2017.

### Awards and Grants

- Awarded an H3ABioNet Travel Fellowship to attend the ISCB–Africa ASBCB Bioinformatics Conference, 11th–15th November 2019, Kumasi, Ghana

- Awarded a travel grant of Euro 500.00 to attend The CODATA-RDA Research Data Science Advanced Workshop on Bioinformatics at the Abdus Salam International Centre for Theoretical Physics (ICTP), Trieste, Italy from 19<sup>th</sup> to 23<sup>rd</sup> August 2019

### **Publications**

- Nasimiyu, C.; Matoke-Muhia, D.; **Rono, G.K.**; Osoro, E.; Ouso, D.O.; Mwangi, J.M.; Mwikwabe, N.; Thiong'o, K.; Dawa, J.; Ngere, I.; Gachohi, J.; Kariuki, S.; Amukoye, E.; Mureithi, M.; Ngere, P.; Amoth, P.; Were, I.; Makayotto, L.; Nene, V.; Abworo, E.O.; Njenga, M.K.; Seifert, S.N.; Oyola, S.O. Imported SARS-CoV-2 Variants of Concern Drove Spread of Infections across Kenya during the Second Year of the Pandemic. *COVID* 2022, 2, 586-598. <https://doi.org/10.3390/covid2050044>
- Ntagereka PB, Oyola SO, Baenyi SP, **Rono GK**, Birindwa AB, Shukuru DW, Baharanyi TC, Kashosi TM, Buhendwa JC, Bisimwa PB, Kusinza AB, Basengere RA, Mukwege D. Whole-genome sequencing of SARS-CoV-2 reveals diverse mutations in circulating Alpha and Delta variants during the first, second, and third waves of COVID-19 in South Kivu, east of the Democratic Republic of the Congo. *Int J Infect Dis.* 2022 May 20;122:136-143. doi: 10.1016/j.ijid.2022.05.041. Epub ahead of print. PMID: 35598737; PMCID: PMC9119719.
- Mwangi, R., Osiany, S., Kiritu, E., Dobi, P., Ouso, D., **Kibet, G.**, Njeru, R. and Oyola, S.O. 2021. ILRI In-House reconstituted SARS-CoV-2 RT-qPCR testing kit as an alternative to the commercial kits.
- Mwangi KW, Mainye N, Ouso DO, Esoh K, Muraya AW, Mwangi CK, Naitore C, Karega P, **Kibet-Rono G**, Musundi S, Mutisia J, Mwangi E, Mgawe C, Miruka S, Kibet CK and OpenScienceKE Collaborators (2021) Open Science in Kenya: Where Are We? *Front. Res. Metr. Anal.* 6:669675. doi: 10.3389/frma.2021.669675

### **Referees.**

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