PETER O. OLUOCH, Ph.D.

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PROFILE

Biomedical scientist with over 8 years of research experience spanning infectious disease genetics, molecular biology, bacterial functional genomics, and bioinformatics. Proven track record of independently leading hypothesis-driven projects and contributing to collaborative, interdisciplinary research environments. Skilled in high-throughput bacterial screens, strain engineering, and genomic data analysis. Experienced in mentoring trainees and publishing in peer-reviewed journals. Open to academic or industry opportunities that leverage expertise in bacterial genetics, functional genomics, and antimicrobial discovery.

SKILLS

Technical expertise – Microbiological techniques, chemical-genetic screens, strain engineering, and FACS sorting.
Digital tools – R/Python, GraphPad, Linux/Bash scripting, HPC clusters
Scientific leadership – Collaboration, strategic project planning, and implementation
Mentorship & Training – SOP creation, student training, lab onboarding

EDUCATION

2019 – 2025 **UMass Chan Medical School**, MA, USA
Ph.D. in Biomedical Sciences – Microbiology

2015 - 2018 **Maseno University**, Kisumu, Kenya
M.Sc. Medical Biotechnology

2008 - 2012 **Kenyatta University**, Nairobi, Kenya
B.Sc. Biochemistry, Second Class, Upper Division

RESEARCH EXPERIENCE

2020 – June 2025 Doctoral research, UMass Chan Medical School, MA, USA

- Designed and executed large-scale *in vitro* and *in vivo* chemical genetic interaction studies of *M. tuberculosis* to define bacterial determinants of antibiotic efficacy.
- Developed bioinformatics pipelines for OMICs data analysis, including whole-genome, RNA, and targeted amplicon sequencing data.
- Developed BSL3 SOPs for multi-omics studies, mentored and trained summer students, and presented research findings at local and national conferences.

2019 – 2020 Research Rotation, UMass Chan Medical School, MA, USA

- Designed functional genomics experiments and analyses of *E. coli* chemical genetics studies using ASKA/KEIO barcoded libraries to study orthologous microbiome evolution during cancer chemotherapy.

2018 – 2019 Visiting Research Scholar, UMass Chan Medical School, USA

- Conducted multi-sample and multi-antigen serological screening to define the influence of *Plasmodium falciparum* malaria and herpesvirus co-infections in pediatric cancers.
- Participated in a multi-country genomic epidemiology study of *P. falciparum* artemisinin pre-resistance mutations.

2015 – 2018 Research Scientist, KEMRI, Kisumu, Kenya

- Developed a molecular inversion probe (MIP) protocol to genotype cytokine single-nucleotide polymorphisms in low-quality/quantity DNA samples
- Participated in collaborative studies to create immortalized B-cell cell lines using endemic Burkitt lymphoma patient samples.

RESEARCH PUBLICATIONS

- **Oluoch, P. O.,** Koh, E., Proulx, M. K., Reames, C. J., Papavinasasundaram, K. G., Murphy, K. C., Zimmerman, M. D., Dartois, V., & Sassetti, C. M. (2025). Chemical genetic interactions elucidate pathways controlling tuberculosis antibiotic efficacy during infection. Proceedings of the National Academy of Sciences, 122(9), e2417525122.
- Luna MJ, **Oluoch PO**, Miao J, Culviner P, Papavinasasundaram K, Jaecklein E, Shell SS, Ioerger TR, Fortune SM, Farhat MR, Sassetti CM. Frequently arising ESX-1-associated phase variants influence Mycobacterium tuberculosis fitness in the presence of host and antibiotic pressures. mBio. 2025.
- Koh, E. I., **Oluoch, P. O.,** Ruecker, N., Proulx, M. K., Soni, V., Murphy, K. C., Papavinasasundaram, K., Reames, C. J., Trujillo, C., Zaveri, A., Zimmerman, M. D., Aslebagh, R., Baker, R. E., Shaffer, S. A., Guinn, K. M., Fitzgerald, M., Dartois, V., Ehrt, S., Hung, D. T., Ioerger, T. R., Sassetti, C. M. Chemical-genetic interaction mapping links carbon metabolism and cell wall structure to tuberculosis drug efficacy. Proceedings of the National Academy of Sciences. 2022**.**
- Rosener, B., Sayin, S., **Oluoch, P. O.,** García González, A. P., Mori, H., Walhout, A. J., & Mitchell, A. Evolved bacterial resistance against fluoropyrimidines can lower chemotherapy impact in the Caenorhabditis elegans host. eLife. 2020.
- **Oluoch, P. O**., Forconi, C. S., Oduor, C. I., Ritacco, D. A., Akala, H. M., Bailey, J. A., Juliano, J. J., & Moormann, A. M. Distinctive Kaposi Sarcoma-Associated Herpesvirus Serological Profile during Acute Plasmodium falciparum Malaria Episodes. IJMS (2023).
- Binder, R. A., Fujimori, G. F., Forconi, C. S., Reed, G. W., Silva, L. S., Lakshmi, P. S., Higgins, A., Cincotta, L., Dutta, P., Salive, M. C., Mangolds, V., Anya, O., Calvo Calle, J. M., Nixon, T., Tang, Q., Wessolossky, M., Wang, Y., Ritacco, D. A., Bly, C. S., Fischinger, S., **Oluoch, P.O**., Moormann, A. M. SARS-CoV-2 Serosurveys: How Antigen, Isotype and Threshold Choices Affect the Outcome. The Journal of Infectious Diseases. 2023.
- Caduff, N., McHugh, D., Rieble, L., Forconi, C. S., Ong'echa, J. M., **Oluoch, P. O**., Raykova, A., Murer, A., Böni, M., Zuppiger, L., Schulz, T. F., Blackbourn, D. J., Chijioke, O., Moormann, A. M., & Münz, C. KSHV infection drives poorly cytotoxic CD56-negative natural killer cell differentiation in vivo upon KSHV/EBV dual infection. Cell reports. 2021.

- Muriuki, B. M., Forconi, C. S., **Oluoch, P. O.,** Bailey, J. A., Ghansah, A., Moormann, A. M., & Ong'echa, J. M. Association of killer cell immunoglobulin-like receptors with endemic Burkitt lymphoma in Kenyan children. Scientific reports. 2021.
- Ippolito, M. M., Pringle, J. C., Siame, M., Katowa, B., Aydemir, O., **Oluoch, P. O**., Huang, L., Aweeka, F. T., Bailey, J. A., Juliano, J. J., Meshnick, S. R., Shapiro, T. A., Moss, W. J., & Thuma, P. E. Therapeutic Efficacy of Artemether-Lumefantrine for Uncomplicated Falciparum Malaria in Northern Zambia. ASTMH. 2020.
- Forconi, C. S., Oduor, C. I., **Oluoch, P. O.,** Ong'echa, J. M., Münz, C., Bailey, J. A., & Moormann, A. M. (2020). A New Hope for CD56negCD16pos NK Cells as Unconventional Cytotoxic Mediators: An Adaptation to Chronic Diseases. Frontiers in cellular and infection microbiology. 2020.
- **Oluoch, P. O.,** Oduor, C. I., Forconi, C. S., Ong'echa, J. M., Münz, C., Dittmer, D. P., Bailey, J. A., & Moormann, A. M. Kaposi Sarcoma-Associated Herpesvirus Infection and Endemic Burkitt Lymphoma. The Journal of Infectious Diseases. 2020.

CONFERENCE & SEMINARS

- **Oluoch, P.O.,** E. Koh, M.K. Proulx, C.J. Reames, K.G. Papavinasasundaram, K.C. Murphy, M.D. Zimmerman, V. Dartois, C.M. Sassetti, Chemical genetic interactions elucidate pathways controlling tuberculosis antibiotic efficacy during infection, Selected talk, **Tuberculosis Research Unit Annual Meeting**, Rockville, MD, 2024.
- **Oluoch, P.O**., Liu Q., Fortune SM, Sterling T.R., C.M. Sassetti, Bacterial predictors of tuberculosis treatment failure. **Poster and oral presentation,** TB/HIV Meeting, Nashville, TN, 2023.
- **Oluoch, P.O.,** M.J. Luna, K.G. Papavinasasundaram, C.M. Sassetti, Antibiotic selection signatures in simple sequence repeats of Mycobacterium tuberculosis. Invited talk, Antibiotic selection signature in simple sequence repeats of M. tuberculosis. **Clear TB Meeting,** Newark, NJ, 2022.

REFEREES

1. Christopher Sassetti, PhD
   Department of Microbiology
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