

Ebenezer Asiedu

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Education

- 2022-present PhD., Molecular and Cellular Biology
Van Andel Institute Graduate School, Grand Rapids, MI, USA
Thesis: Metabolic control of dendritic cell-mediated immunity
Advisor: Connie Krawczyk (PhD)
- 2015-2019 BSc., Biochemistry
University of Cape Coast, Cape Coast, Ghana
Dissertation: Stabilization of ascorbic acid through liposomal encapsulation
Advisor: Francis Abrokwhah (PhD)

Research Experience

- 2023-present **Doctoral candidate**, Van Andel Institute Graduate School, Grand Rapids, MI, USA
Thesis: Metabolic control of dendritic cell-mediated immunity
- Investigating how metabolism coordinates dendritic cell (DC) activation.
 - Established strategies to obtain high numbers of *in vivo* DCs.
 - Characterized the kinetics of DC activation and their metabolic dependencies.
 - Establishing methods for low-input metabolomics profiling of DCs.
 - Developing platforms to allow efficient and quick genetic engineering of DCs in mice.
 - Interrogating nutrient sharing between DCs and T cells using stable isotope tracing.
 - Mastery of absolute quantification of intracellular and extracellular metabolites using liquid and gas chromatography-mass spectrometry (LC- and GC-MS).
- 2022-2023 **Rotation Student**, Van Andel Institute Graduate School, Grand Rapids, MI, USA
- Genetically manipulated KDM5C expression in T cells to study their immunomodulatory effects, leading to co-authorship. (*Krawczyk Lab*)
 - Established cell lines expressing the C9orf72 dipeptide repeats to study the molecular drivers of amyotrophic lateral sclerosis. (*Zhu lab*)
 - Characterized the DNA methylome of colorectal cancer mouse model expressing *Dnmt1* hypomorphs using advanced epigenomic analytical tools to provide insights into how DNA methylation drives colorectal oncogenesis. (*Laird lab*)
- 2020-2023 **Research assistant**, Kwame Nkrumah University of Science and Technology, Ghana
Advisor: Alexander Kwarteng (PhD)
- Established dry-lab pipelines to interrogate parasitic protein targets.
 - Identified and characterized the drivers of filariasis and malaria using *in silico* tools.
 - Assisted with social assessment of filariasis patients.
- 2018-2019 **Undergraduate dissertation research**, University of Cape Coast, Ghana
Advisor: Francis Abrokwhah (PhD)
- Investigated strategies to improve ascorbic acid stability using a lipid-based coating approach known as liposomal encapsulation.
 - Prepared liposomal bodies from egg phospholipids.
 - Characterized ascorbic acid stability under varying and ranging storage conditions.

Teaching Experience

- 2019-2020 **Teaching assistant,**
 Department of Biochemistry, University of Cape Coast, Ghana
 BCH 422 – Immunology and Immunochemistry
 BCH 402 – Fermentation
 BCH 405 – Integration and control of Metabolism
- 2019-2020 **Course coordinator,**
 School of Biological Sciences, University of Cape Coast
 BIO 101 – Diversity of Living Organism - Practical

Publications

- Guak H, Weiland W., Vander Ark A., Zhai L., Kin Lau, Corrado M., Davidson P., **Asiedu E.**; Mabvakure B., Compton S., DeCamp L., Scullion A. C., Jones R. G., Nowinski S. M., Krawczyk C., et al. (2024). The histone demethylase KDM5C regulates IRF transcriptional programming impacting dendritic cell population heterogeneity and function. (2024). *Cell Reports* 43.
- Asiedu, E.**, Larbi, A., Adankwah, E., Yambah, K. J., Obiri-Yeboah, D., Kwarteng, A. Transcriptome profiling reveals unique biological mechanisms and gene signatures associated with cerebral malaria. (2022). *Gene Reports* 28.
- Kwarteng, A., **Asiedu, E.**, Koranteng, K. K. & Asiedu, S. O. Highlighting the Relevance of CD8+ T Cells in Filarial Infections (2021). *Frontiers in Immunology* 12, 1–11.
- Kwarteng, A., **Asiedu, E.**, Sylverken, A., Larbi, A., Mubarik, Y., & Apprey, C. (2021). In silico drug repurposing for filarial infection nilotinib and paritaprevir potential inhibitors of the Wolbachia 5'-aminolevulinic acid synthase. *Scientific Reports*, 1–14
- Kwarteng, A., Sylverken, A., **Asiedu, E.**, & Ahuno, S. T. (2021). Genome editing as control tool for filarial infections. *Biomedicine & Pharmacotherapy*, 137, 111292.
- Kwarteng, A., **Asiedu, E.**, Sylverken, A. A., Larbi, A., Sakyi, S. A., & Asiedu, S. O. (2021). Molecular characterization of interactions between the D614G variant of SARS-CoV-2 S-protein and neutralizing antibodies: A computational approach. *Infection, Genetics and Evolution*, 91, 104815.
- Fordjour, F. A., **Asiedu, E.**, Larbi, A., & Kwarteng, A. (2021). The role of nuclear factor kappa B (NF- κ B) in filarial pathology. *Journal of Cell Communication and Signaling*, 15(2), 185–193.
- Kwarteng, A., **Asiedu, E.**, Mubarik, Y., Katawa, G., & Asiedu, S. O. (2021). Exploring Onchocerca volvulus Cysteine Protease Inhibitor for Multi-epitope Subunit Vaccine Against Onchocerciasis: An Immunoinformatics Approach. *Int. J. Pep. Res. Ther*, 1–14.
- Kwarteng, A., **Asiedu, E.**, Sakyi, S. A., & Asiedu, S. O. (2020). Targeting the SARS-CoV2 nucleocapsid protein for potential therapeutics using immuno-informatics and structure-based drug discovery techniques. *Biomedicine & Pharmacotherapy*, 132, 110914.
Role: Conceptualized study, performed all analysis, wrote manuscript.
- Asiedu, E.** (2020). Designing Effective Small Interfering RNA for Post-Transcriptional Silencing of Human GREM1: A Comprehensive Bioinformatics Approach. *bioRxiv*.

Academic Talks

- Metabolic control of dendritic cell-mediated immunity.* VAIGS Graduate Student Seminar Series. January 23rd, 2025
- Fine-tuning cDC1 activation via metabolic manipulation.* Autumn Immunology Conference 2024. November 24th, 2024
- Machine learning identifies gene signatures of cerebral malaria.* Immunological Society of Ghana 3rd Meeting. September 21st, 2021

Poster Presentation

- **Asiedu, E**, Weiland, M., Swanson, A, Krawczyk, CM. *PHGDH Moonlighting Modulates Dendritic Cell Immunity*. VAI Scientific Retreat 2025, Grand Rapids, USA. June 10th, 2025
- **Asiedu, E**, Weiland, M. Krawczyk, CM. *Beyond Glycolysis: Metabolic Manipulation reveals unknown determinants of cDC1 activation*. Autumn Immunology Conference 2024, Chicago, USA. November 24th, 2024
- **Asiedu, E**, Weiland, M. Krawczyk, CM. *The serine synthesis pathway is vital for cDC1 activation*. DC2024, Barcelona, Spain. October 20th, 2024

Honors and awards

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| 2025 | 3 rd Place - Best Poster Award - VAI Scientific Retreat 2025 |
| 2021 | AACR Student and Early Career Investigator Scholarship |
| 2021 | 2 nd Place - Best talk at the Immunological Society of Ghana's 3 rd Webinar |

Leadership & Volunteering/Outreach Services

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| 2018-2019 | Biological Science Students Association of Ghana (BIOSSTAG)-UCC Chapter |
| | <ul style="list-style-type: none"> • President (2018-2019) • Outreach team Member (2019) |

Mentoring Experience

- Grazia Edumaba Graham (Kwarteng Lab), now a Data Analyst at Blossom Academy, Ghana
- Cephas Biney (Kwarteng Lab), now MPhil Student in Bioinformatics, KNUST, Ghana
- Jeffery Owusu (Kwarteng Lab), now a Clinical lab scientist, ThermoFisher Scientific, Wisconsin
- Caleb Mensah (Kwarteng Lab), now a PhD student, Virginia Tech University

Professional Development Training

- Epigenomics analysis, Canadian Bioinformatics Workshop (CBW), September 2021
- Ethical Conduct for Research Involving Humans (TCPS 2), Canadian Panel on Research Ethics, April 2021

Professional Membership

- Association of American Immunologists (AAI), since 2022
- American Association of Cancer Research (AACR), since 2021
- Ghana Biochemistry Students Association (GHABSA), since 2016
- Biological Sciences Students Association of Ghana (BIOSSTAG), since 2016

Technical Skill

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| Dry-lab | R, GraphPad, RNAseq, ATAC-seq, CHIP-seq, DNA methylation, Metabolomics |
| Wet-lab | Mammalian cell culture, Media formulation, Metabolomics sample prep, Stable Isotope tracing, GC/LC-MS, Flow Cytometry, Cloning, Western blotting |

References

Available upon request.