JOY NYAANGA

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EDUCATION

Ph.D. **Northwestern University** – Evanston, IL **Expected 2022**
Quantitative Biology

M.A. **Princeton University** – Princeton, NJ **2018**
Molecular Biology

B.S. **John Carroll University** – University Heights, OH **2017**
Double Major: Biochemistry; Cell and Molecular Biology

SKILLS

Computing: R, GitHub, Python, bash
Data science: data analysis, data mining, visualization, dashboarding
Statistics: regression models, maximum likelihood, gaussian mixture modeling, model selection

RELEVANT RESEARCH AND PROJECTS

Ph.D. Candidate | Northwestern University **2018 - Present**

- Investigate the genetic variation underlying differences in developmental growth using *Caenorhabditis elegans* to decipher how organisms control growth rate and developmental timing
- Optimize a high-throughput experimental platform for the acquisition of traits associated with development
- Collaborate with mathematicians to build mechanistic models to explore complex growth relationships
- Develop and implement an R package to facilitate handling and visualization of image-based data
- Mentor and train six undergraduate and high school students on independent computational research projects

Ph.D. Candidate | Northwestern University **Summer 2021**

- Evaluated and implemented lineage reconstruction and trajectory analysis methods in single-cell RNAseq data to better understand the dynamics of disease progression.

Masters Student | Princeton University **2017 - 2018**

- Probed RNA-protein interactions regulated by 8-oxoG to uncover cellular changes caused by oxidative stress
- Analyzed results and identified alternative approaches and solutions to research
- Employed Python to model biochemical reactions to study the dynamics of gene and protein networks

Summer Research Student | Cleveland Clinic **Summer 2016**

- Computationally identified mutations that altered N-glycosylation in factor VIII, a procoagulant protein
- Constructed plasmids containing mutations of interest

Undergraduate Researcher | John Carroll University **2015 - 2016**

- Studied lipid peroxidation of linoleic acid using gas chromatography – mass spectrometry
- Presented results in a university poster competition (awarded special merit)

SELECT LEADERSHIP & OUTREACH

Graduate Teaching Assistant | Northwestern University **2020 - 2021**

- Instructed 105 students across three biology courses
- Designed quiz material, prepared lecture presentations, and facilitated in-class discussions
- Provided verbal and written assessment on course progress

Campus Tour Guide | John Carroll University **2015 - 2017**

- Managed correspondence with visitors
- Demonstrated the importance of clear communication while leading campus walking tours

PUBLICATIONS

Peer-reviewed:

Nyaanga, Joy, Timothy A. Crombie, Samuel J. Widmayer, and Erik C. Andersen. 2021. "easyXpress: An R Package to Analyze and Visualize High-Throughput *C. elegans* Microscopy Data Generated Using CellProfiler." *PloS One* 16 (8): e0252000.

Preprint:

Nyaanga, Joy, Christina Goss, Gaotian Zhang, Hannah N. Ahmed, Elliot J. Andersen, Isabella R. Miller, Justine K. Rozenich, et al. 2021. "Highly Scaled Measurements of *C. elegans* Development Suggest That Physical Constraints Guide Growth Trajectories and Animal Shape." bioRxiv. https://doi.org/10.1101/2021.04.01.438121.