

Aaron Colon

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Summary

Undergraduate researcher in Biostatistics & Health Data Science with experience in computational epidemiology, bioinformatics, and DNA computation. I am interested in data-driven public health forecasting and outbreak simulation.

Education

Lehigh University, Bethlehem, PA Biostatistics & Health Data Science, Pre-medicine   GPA: 3.77	Graduation: May 2027
Easton High School, Easton, PA AP Scholar with Honors, High Honor Roll, Top 1% Graduating Class	Graduation: June 2023 Honors:

Technical Skills:

- **Programming & Data Science:** Python, R , GitHub
- **Modeling & Analytics:** Epidemiological modeling (SIR), Simulation design, Feature engineering
- **Bioinformatics Tools:** HHPred, Phamerator, DNA Master, PhagesDB, GeneMarkS, DeepTMHMM, SOSUI
- **Data Visualization:** Matplotlib, ggplot2

Research Involvement

Forecasting Disease Outbreaks using Temporal Networks in Congregate Settings	2024-Current
<ul style="list-style-type: none"><li>• <b>Hypothesis:</b> Epidemic outbreaks in congregate settings can be predicted and mitigated through network-based modeling of temporal interactions.</li><li>• <b>Results:</b> Built temporal contact network models using real-world conference data; simulations showed that targeted interventions at high-degree or high-betweenness nodes significantly reduced outbreak magnitude.</li><li>• <b>Skills learned and applied:</b> Network analysis (Python: pandas, networkx, matplotlib), SIR simulation modeling, data visualization, public health informatics, and mathematical modeling of infection dynamics.</li></ul>	
DNA Sticker Computation via Electrowetting	2023-Current
<ul style="list-style-type: none"><li>• <b>Hypothesis:</b> DNA strands can be used as programmable “stickers” in a microfluidic environment to perform combinatorial computations through electrowetting-on-dielectric (EWOD) control.</li><li>• <b>Results:</b> Demonstrated droplet-based manipulation of DNA “sticker” sequences on EWOD chips, validating the feasibility of bio-inspired logical operations and contributing to an upcoming manuscript.</li><li>• <b>Skills learned and applied:</b> EWOD operation, DNA computation principles, lab instrumentation, and research writing</li></ul>	
Sea-Phages/Sea-Genes	2023-2024
<ul style="list-style-type: none"><li>• <b>Hypothesis:</b> The genomic structure and coding potential of Mycobacterium smegmatis phage <i>Hanako</i> could reveal unique gene functions contributing to host-phage interactions.</li><li>• <b>Results:</b> Successfully annotated and submitted <i>Hanako</i>’s genome to NCBI GenBank, identifying hypothetical proteins and refining gene start/stop predictions through comparative analysis using Starterator, GeneMarkS, and BLASTp.</li><li>• <b>Skills learned and applied:</b> Genome annotation, bioinformatics tools (DNA Master, PhagesDB, HHPred, DeepTMHMM, SOSUI, Phamerator), comparative genomics, GenBank formatting and submission.</li></ul>	

Presentations

- Lehigh Summer Research Expo Presenter (2x)
- Lehigh College of Health Research Expo Presenter
- 30th International Conference on DNA Computing and Molecular Programming Poster Presenter

Awards

- Dean’s List (4x)
- Best Research Award (DNA Sticker Computation via Electrowetting)
- Tri-Alpha Inductee
- Lehigh Trustee Scholar