Michael J. Akinyemi

Phone: (850) 850-1127 — **Website:** michaelakinyemi.com — **Email:** mi542876@ucf.edu

RESEARCH INTERESTS

Computational Biology, Immune Engineering, Systems Biology/Immunology, Molecular Biophysics, Autoimmune Disorders, Probabilistic Algorithms, Biostatistics

EDUCATION

University of Central Florida — Orlando, FL
Biomedical Sciences (B.S.) — Spring 2025
Computer Science (Minor)
Genomics & Bioinformatics (Minor)

- Ronald E. McNair Scholar
- Relevant Coursework:
  - *CS: Discrete Structures I, Computer Science II, Computer Logic & Organization, Object Oriented Programming, Matrix & Linear Algebra*
  - *Bio: Immunology, General Microbiology, Biochemistry I, Molecular Biology II, Quantitative Biological Methods*

Tallahassee Community College — Tallahassee, FL
Associate of Arts (A.A.) — Summer 2022

- Phi Theta Kappa Honors Society

RESEARCH EXPERIENCE

University of Central Florida — Orlando, FL
College of Medicine — December 2023 — Present
Advisor: Dr. Hung Nguyen
Research Assistant

- Independently developed a new immune cell datamining pipeline to analyze PBMC scRNA-Seq datasets to discover correlations between metabolic activity and the grafts vs leukemia (GvL) effect.
- Investigated correlation between the gut microbiome and immune cell behavior using machine learning models to integrate 16S rRNA-Seq & various single-cell assays.

Massachusetts Institute of Technology — Cambridge, MA
Department of Chemical Engineering — June 2023 — Present
Advisor: Dr. Brandon DeKosky
Research Intern | MIT Summer Research Program
Sequential Insertion Project (Summer 2023)

- Contributed to a project improving the efficiency of cell line generation for antibody library display systems by reducing the length of the donor plasmid.
- Successfully performed troubleshooting of restriction cloning experiments to construct donor plasmid for CRISPR/Cas9-mediated genome integration.
- Developed a suite of automated data visualization tools capable of handling high-throughput sequence data.
- Optimized clustering algorithms within bioinformatics pipelines to analyze BCR/TCR immune repertoire data collected through NGS, resulting in a ¿70% faster runtime.
- Developed a novel tool using **Hidden Markov Models (HMMs)** and probabilistic approaches to correct errors in next-generation sequencing (NGS) of antibody libraries.

Bioinformatics & HPC Algorithm Optimization

- Contributed to a project improving the efficiency of cell line generation for antibody library display systems.
- Successfully troubleshot restriction cloning experiments for construction of donor plasmid for CRISPR/Cas9 system.
- Optimized clustering algorithms within bioinformatics pipelines to analyze BCR/TCR immune repertoire data collected through NGS.
- Developed automated data visualization tools capable of handling high-throughput sequence data.

HONORS, AWARDS & SCHOLARSHIPS

McNair Summer Research Institute Scholarship Orlando, FL
Ronald E. McNair Scholars Program August 2023

Conference Presentation Travel Award Orlando, FL
UCF Office of Undergraduate Research November 2023

Florida Bright Futures Academic Scholars Tallahassee, FL
Florida Department of Education December 2020

President's List (3 Times)

Dean's List (2 Times)

PUBLICATIONS

Akinyemi, M., & DeKosky, B. (1979). **Probabilistic Approaches to Correct Antibody Library Sequence Errors** Econometrica, 47(2), 263-291. (Published)

PRESENTATIONS

Leadership Alliance National Symposium Hartford, CT
Oral *Probabilistic Approaches to Correct Antibody Library Sequence Errors* July 2024

UCF Student Scholar Symposium Orlando, FL
Poster *Overcoming Challenges in CRISPR Vector Restriction Cloning to Optimize Generation of Immune Repertoires.* March 2024

Annual Biomedical Research Conference For Minoritized Scientists (ABRCMS) Phoenix, AZ
Poster *Generating a Stable Cell Line: Troubleshooting Restriction Cloning of a CRISPR Vector For Sequential Genome Insertion.* November 2023

MIT Summer Research Program Fall Extension Research Showcase Virtual
Poster *Investigating Diversity of V(D)J Gene Recombinants Within Antibody Repertoires* November 2023

MIT Summer Research Program Showcase Cambridge, MA
Poster *Generating a Stable Cell Line: Troubleshooting Restriction Cloning of a CRISPR Vector For Sequential Genome Insertion.* July 2023

OTHER EXPERIENCES

Quantitative Methods Workshop Cambridge, MA
Massachusetts Institute of Technology January 2023

- Employed principal component analysis (PCA) and k-means clustering to differentiate cells of a scRNA-Seq PBMC data set.
- Used machine learning pipelines (CryoSPARC) to generate 3D protein structures from high-framerate movies of CryoEM data.

Scripting Team Leader Remote
AvatarMC May 2017 — June 2022

- Developed both command-line & GUI-based automation tools to assist workflows of other teams.
- Designed quality assurance testing plans for experimental features.
- Assisted in writing & maintaining documentation of in-house scripting language.
- Wrote design documents for deliverable requests/feature improvement tasks.
- Led projects using professional management software (Phabricator).
- Directed team meetings & effectively delegated tasks.

KNOWLEDGE & SKILLS

Biological Research

Restriction Cloning, Flow Cytometry, Electroporation, Polymerase Chain Reaction (PCR), Gel Electrophoresis, Agarose Gel Extraction, Immunoprecipitation, Cell Culture (Mammalian & Bacterial), Murine Model Handling, Miniprep/Maxiprep

Programming Languages

Python	Professional.
R	Professional.
C++	Professional.
Bash/Shell	Advanced.
Java	Advanced.
RegEx	Intermediate.

Software

LaTeX	Professional
Git	Professional.
Slurm	Advanced.
SnapGene	Advanced.
Docker	Elementary.
PyMol	Elementary.

Operating Systems

Linux/UNIX	Professional.
HPC-Clusters	Advanced.

Natural Languages

English	C2 level.
Latin	A2 level.
Spanish	A2 level.
Yoruba	A1 level.

COMMUNITY INVOLVEMENT

Society for the Advancement of Chicanos/Hispanics and Native Americans in Science (SACNAS) | *Vice President* — Orlando, FL
University of Central Florida — April 2024 — Present

- Assisted president in managing club and leading officer meetings.
- Held general body meetings discussing tips/advice to help underrepresented students get started in research and the journey to graduate school.

Active Minds | *Secretary* — Orlando, FL
University of Central Florida — December 2023 — Present

- Advocated for mental health and the importance of fighting against the negative stigmas associated with them.
- Organized club records, took meeting minutes & performed general administrative duties.