PROVIDENCE PANGIRA

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EDUCATION

Texas A&M University, College Station, Texas — Aug 2026–Present
Ph.D. Student, Interdisciplinary Graduate Program in Genetics and Genomics

Bethune-Cookman University, Daytona Beach, Florida — May 2026
Bachelor of Science in Biology | Minors: Computer Science and Biochemistry | GPA: 4.0

RESEARCH EXPERIENCE

Florida Medical Entomology Laboratory — Research Lab Scientist — May 2025–May 2026

- Conducted genetic engineering research on Anopheles crucians to develop a transgenic mosquito line aimed at advancing malaria vector control strategies.
- Applied sequence analysis, vector design, and gene-transformation workflows to identify and introduce target genes into mosquito populations.
- Collaborated on experimental design and laboratory protocols to evaluate gene expression, inheritance, and potential applications of transgenic mosquitoes in disease control.

B-CU R.I.S.E. — Swarm Robotics Summer Intern — May 2025–Aug 2025

- Developed a bio-inspired, real-time task-assignment algorithm for homogeneous UGV swarms to improve disaster-response efficiency through autonomous coordination and fault tolerance.
- Designed and implemented Python-based swarm simulations modeling attraction, repulsion, and alignment forces, achieving effective grouping, coverage, and obstacle avoidance.
- Presented research findings to faculty and peers while applying concepts from biology and robotics to real-world engineering challenges.

B-CU R.I.S.E. — Research Lab Scientist — Oct 2022–May 2024

- Conducted site-directed mutagenesis to create and validate single and double mutants of the alr3166 gene; expressed constructs using pMS-107 and pGEX-4T-3 vectors in E. coli and confirmed mutations by gel electrophoresis.
- Used protein-modeling tools including NovaFold, PyMOL, and I-TASSER to reconstruct and analyze motifs of Anabaena sensory rhodopsin and its transducer.
- Performed molecular docking analysis identifying electrostatic interactions between receptor Arg residues and transducer Asp residues; purchased reagents and modified standard operating procedures.

U.S. Fish and Wildlife Service Internship Program — Data Analyst — Oct 2022–May 2026

- Cleaned, organized, and mapped telemetry data for conservation and species-preservation projects.
- Used ArcGIS Pro to transform approximately 30 years of tabular telemetry data into shapefiles.
- Consolidated researcher datasets and mapped telemetry data for Audubon's crested caracara to support assessment of habitat use and conservation needs.

Brevard Zoo — Summer Intern — May 2024–Aug 2024

- Managed care and welfare of Perdido Key beach mice, Florida grasshopper sparrows, and frosted flatwoods salamanders through feeding, behavioral observations, and video monitoring.
- Conducted a 20-year analysis of beach mouse lifespan and causes of death to inform longevity improvements in human care.
- Used pedigree analysis and basic genetics approaches to inform molecular studies supporting conservation of Perdido Key beach mice.

Seagrass Restoration Project — Data Analyst and Lab Scientist — Sep 2023–Aug 2024

- Analyzed the effects of stratification on seed viability and germination and applied Kruskal-Wallis and one-way ANOVA tests in R.
- Co-authored a review of mosquito-control impoundments and their role in seagrass restoration.

Africa University Malaria Research Laboratory — Nov 2021–Jul 2022

- Performed PCR and circumsporozoite protein ELISA for malaria-related laboratory work; prepared technical reports and maintained daily documentation of methods, findings, and progress.
- Collected and analyzed rapid diagnostic test data and supported research conducted under the Presidential Malaria Initiative.

- Assisted with laboratory project management and troubleshooting, including modification of Anopheles funestus positive controls to improve gel quality.

LEARNING ENGINEERING EXPERIENCE

Carnegie Mellon University LearnLab Summer School **2026**

- Developed Torus-ready genetics and pathway-learning modules organized around measurable learning objectives, component skills, and aligned formative and summative assessments.
- Built assessment content on gene interaction, epistasis, gene regulation, developmental pathways, and cancer pathways, including a 20-question assessment bank and a curriculum of approximately 30 learning objectives.
- Designed biology and genetics instructional content for CMU's Torus online learning platform and developed a Pathway Algebra framework for simplifying complex biological pathways into standardized instructional representations.

Carnegie Mellon University LearnLab Summer School **2025**

- Created aligned genetics assessments and presented the Pathway Algebra instructional-design project during the LearnLab Summer School.

PEER-REVIEWED PUBLICATIONS

- Cho, H. J., Linder, J., Coffey-Picco, B., **Pangira, P.**, & San Antonio, K. M. (2024). Review of Florida's mosquito control impoundments for natural nursery of Ruppia maritima. Ecological Restoration, 42(4), 267–270. https://doi.org/10.3368/er.42.4.267
- Trivedi, V. D., Oscar-Okpala, T., **Pangira, P.**, & Vernier, B. T. (2024). On the role and structural outlook of the carboxy-terminal domain of Anabaena sensory rhodopsin. International Journal of Biochemistry & Physiology, 9(1), 000247. https://doi.org/10.23880/ijbp-16000247

PUBLISHED ABSTRACTS

- **Pangira, P.**, Burini, B., Bae, J., et al. (2026). Abstract 4487: Identification and characterization of a β2-tubulin promoter in Anopheles crucians for pgSIT-based vector control. Journal of Biological Chemistry.
- Trivedi, V., Okpala, T., **Pangira, P.**, & Vernier, B. (2024). Abstract 1681: Molecular basis of Anabaena sensory rhodopsin–transducer interaction: A biophysical and molecular-docking investigation of the receptor's charged cytoplasmic motif. Journal of Biological Chemistry, 300(3), 106953. https://doi.org/10.1016/j.jbc.2024.106953
- **Pangira, P.**, Oscar-Okpala, T., & Trivedi, V. D. (2023). Site-directed mutagenesis and characterization of a novel photosensory transducer encoded by alr3166 in Anabaena PCC 7120 [Conference abstract BIO-P02]. Florida Scientist, 86(Suppl. 1).
- **Pangira, P.**, & Ayala, E. (2023). Telemetry data cleaning and mapping in ArcGIS for Audubon's crested caracara in South Florida [Conference abstract GEO-03]. Florida Scientist, 86(Suppl. 1).

SELECTED CONFERENCE PRESENTATIONS

- **Pangira, P.** (2025). Decentralized bio-inspired task allocation for UGV rescue swarms [Research presentation]. B-CU RISE Summer Research, Entrepreneurship, and Innovation Symposium, Daytona Beach, FL.
- **Pangira, P.** (2025). Evaluating conservation strategies for the Perdido Key beach mouse [Poster presentation]. Florida Undergraduate Research Conference.
- **Pangira, P.** (2024). Stability, structural insight, and characterization of a novel photosensory transducer encoded by alr3166 in Anabaena PCC 7120 [Research presentation]. Bethune-Cookman University RISE Research Symposium, Daytona Beach, FL.

TEACHING AND MENTORING EXPERIENCE

Bethune-Cookman University — Peer Mentor **Jan 2023–May 2026**

- Provided individualized and group tutoring in Biology, General Chemistry, and Organic Chemistry, helping students strengthen conceptual understanding and academic performance.
- Developed study guides, practice problems, and exam-preparation materials for diverse learning styles.
- Mentored students by explaining scientific concepts in more accessible terms.

LEADERSHIP, SERVICE, AND OUTREACH

National Parks Conservation Association — Young Leaders Council Member **Jun 2023–Aug 2025**

- Contributed to regional conservation initiatives in the Suncoast Region and supported youth engagement in environmental advocacy.

- Led and participated in education and community outreach programs promoting conservation awareness and strengthening community connections with national parks.
- Attended Everglades Coalition conferences annually from 2023 onward to engage with policymakers, scientists, and conservation advocates.

CBRE — Campus Ambassador Aug 2023–Dec 2024

- Coordinated campus activities and student information sessions, increasing engagement with CBRE opportunities and brand visibility.
- Built relationships with students and faculty and supported campus engagement through targeted events and digital marketing.
- Developed marketing campaigns and provided engagement-metrics reports to CBRE supervisors.
- Volunteer Data Analyst, Brevard Zoo
- Volunteer, International Coastal Cleanup | 2023–2025
- Secretary, Florida–Georgia Louis Stokes Alliance for Minority Participation
- Student Advisory Council Member, Bethune-Cookman University QEP RISE Initiative

TECHNICAL SKILLS

- **Molecular Biology:** PCR; DNA fingerprinting; ELISA; site-directed mutagenesis; gel electrophoresis; assay troubleshooting; aseptic technique
- **Computational and Data:** Python; R; ArcGIS Pro; statistical analysis; data visualization; sequence analysis
- **Structural Biology and Research:** PyMOL; I-TASSER; molecular docking; protein modeling; experimental design; scientific writing

HONORS, AWARDS, AND CERTIFICATIONS

- Presidential Scholar
- Bethune-Cookman University Honors Program
- Undergraduate Research Medallion
- MIT 2025 QMW Scholarship Recipient
- Multiple Conference Scholarship Recipient
- MolSSI Computational Chemistry Certification