

CHARLES CARIGNAN

Computational Geneticist | Scientific Writer | Genomics & Transcriptomics | Molecular Genetics | R, Python, Linux

Chicago, IL | (414) 255-5179 | charlie44car27@gmail.com

PROFESSIONAL SUMMARY

M.S.-trained geneticist with 3+ years of research experience combining RNA-seq and differential gene expression analysis with hands-on molecular genetics, including PCR assay development, microsatellite genotyping, and quality control. Experienced in Linux-based sequencing-data workflows, statistical analysis, and troubleshooting ambiguous results before data are reported. Communicates complex findings clearly through a thesis, conference presentations, figures, and undergraduate teaching. Motivated to apply this mix of bench and computational skills to genomic and precision-medicine research.

CORE SKILLS

- **Genomics & Bioinformatics:** RNA-seq/transcriptome analysis; differential gene expression; read correction and trimming; transcript assembly; sequence alignment; maximum-likelihood phylogenetics; BLAST; NCBI SRA and GenBank. Tools: Rcorrector, Trimmomatic, Bowtie2, Kraken2, VSEARCH, rnaSPAdes, MAFFT, IQ-TREE2
- **Molecular Methods & QC:** genomic DNA extraction; NanoDrop DNA/RNA quantification and purity assessment; allele-specific and touchdown PCR; primer design and validation; PCR optimization and troubleshooting; microsatellite (SSR) genotyping and allele scoring (ABI 3730xl capillary electrophoresis; Thermo Fisher MSA); gel electrophoresis; quality-control review of results
- **Programming & Statistics:** R; Python; Linux; Microsoft Excel; Fiji/ImageJ; chi-square, maximum-likelihood, and Bayesian analysis; experimental design; figure and table preparation
- **Scientific Writing & Communication:** thesis and report writing; literature review; scientific posters; oral presentations; undergraduate instruction

RESEARCH EXPERIENCE

Graduate Researcher, Molecular Genetics & Plant Reproductive Biology | University of Illinois Chicago
| Chicago, IL | Aug 2024 – Jul 2026

- Analyzed RNA-seq datasets with Linux-based workflows covering read correction and trimming, targeted transcript assembly, sequence searches, alignment, and maximum-likelihood phylogenetic inference; summarized results in figures, tables, and written reports.
- Assisted as a computational biologist on a differential gene expression project examining genes in flower color pathways, supporting analysis and interpretation of expression patterns.
- Designed and independently performed allele-specific PCR genotyping workflows (primer design and validation, touchdown PCR optimization, gel electrophoresis); troubleshoot weak or

ambiguous amplification and repeated questionable assays to ensure reliable genotype assignment.

- Extracted genomic DNA from tissue and pollen and assessed concentration and purity by NanoDrop spectrophotometry; maintained organized sample and cross records across concurrent experiments.
- Applied chi-square, maximum-likelihood, and Bayesian analyses in R to test whether seed genotype ratios fit expectations under gametophytic self-incompatibility and to evaluate genetic diversity.
- Wrote an M.S. thesis and presented findings at research conferences; trained and assisted undergraduate students.

Research Assistant | CIM2AS (Cultural Immersion in Monarchs and Milkweeds Advancing Science Education), University of Illinois Chicago | Chicago, IL | May 2025 – Present

- Perform microsatellite (SSR) genotyping for a population-genetics project, including sample collection, DNA extraction, PCR amplification, capillary electrophoresis on an ABI 3730xl DNA Analyzer, allele scoring in Thermo Fisher Microsatellite Analysis (MSA) software, data analysis in R using adegenet, and manuscript writing.

Undergraduate Research Fellow / Laboratory & Field Technician | UW-Milwaukee | Milwaukee, WI | Dec 2022 – Jul 2024

- Completed a senior thesis modeling photosynthesis-irradiance relationships and daily primary productivity from controlled light-gradient incubations; performed laboratory and field sampling, spectrophotometry, microscopy, water-chemistry analyses, and quantified larval fish measurements from microscope images using Fiji/ImageJ across temperature treatments.

EDUCATION

M.S. in Biological Sciences | University of Illinois Chicago | Chicago, IL | 2026

Thesis: *The Genetic Basis of Self-incompatibility in Cactaceae*

B.S. in Freshwater Sciences, Minor in Biological Sciences | University of Wisconsin-Milwaukee | Milwaukee, WI | 2024

Magna Cum Laude | GPA: 3.67 | Senior Thesis: *Modelling Daily Photosynthetic Rates of Freshwater Phytoplankton from in-vitro Light Incubations*

TEACHING, PRESENTATIONS & AWARDS

- **Teaching Assistant**, University of Illinois Chicago (2024 – 2026): instructed undergraduates in Genetics, Evolution, and Evolution & Ecology, providing individualized technical guidance.
- Carignan, C.R., Ramanauskas, K., & Igić, B. (2025). A prickly problem for rare cacti: Is the diversity of S-alleles low across Cactaceae? Botany 2025, Palm Springs, CA.
- Carignan, C.R., & Bootsma, H.A. (2024). Modelling Daily Photosynthetic Rates of Freshwater Phytoplankton from in-vitro Light Incubations. UWM Undergraduate Research Symposium.
- UIC Biological Sciences Department Travel Award (2025) | UWM Support for Undergraduate Research Fellows (2022 – 2024)