

Alyssa Vanerelli

PHD CANDIDATE · COMPUTATIONAL AND INTEGRATIVE BIOLOGY

Rutgers University Camden

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Education

Rutgers University Camden

Camden, NJ

PHD IN COMPUTATIONAL AND INTEGRATIVE BIOLOGY

2022 - present

- Advisor: Dr. Anthony Geneva

University of North Carolina at Asheville

Asheville, NC

B.S. IN BIOLOGY, MINOR IN MATHEMATICS

2018 - 2021

- Valedictorian of the Class of 2021 | GPA: 3.967
- Senior thesis: Complete Protein-Coding Mitochondrial Genomes of 13 West Indian Boas
- Advisor: Dr. Graham Reynolds

Asheville-Buncombe Technical Community College

Asheville, NC

COURSEWORK, NON-DEGREE SEEKING

2016 - 2018

- GPA: 3.824

Research Training and Experience

PhD | Rutgers University Camden

Camden, NJ

ADVISOR: DR. ANTHONY GENEVA

2022 - Present

- **Dissertation:** “Evolutionary genomics of Caribbean *Anolis* Lizards”
- **Skills:** Large-scale data processing and analysis (high-throughput sequencing datasets), genome assembly and annotation, machine learning applications to high-dimensional biological data, variant calling, population-level data analysis, detection of natural selection and comparative genomic analysis, sequence alignment and phylogenomic inference, data visualization and interpretation, pipeline development and workflow automation, bash, R, python, Snakemake, high-performance computing using SLURM, Linux/Unix command-line environments, parallel job execution and resource optimization.

Field Research: Sex Chromosome Evolution

Grand Cayman

FIELD LEADER: DR. INBAR MAAYAN

March 2025

- Collecting blood to generate karyotypic data to study sex chromosome evolution in Jamaican *Anolis* lizards.
- **Skills:** Live lizard capture, blood sample collection from tail, field data recording.

Post-Baccalaureate Research | Rutgers University Camden

Camden, NJ

ADVISOR: DR. ANTHONY GENEVA

2021 - 2022

- Analyzing next-generation sequence data to study the evolutionary genomics of *Anolis* lizards from the Caribbean.
- **Skills:** DNA extraction and purification, computing cluster, next-generation sequence data prep and analysis, genome assembly and annotation.

Field Research: Phylogeography of Jamaican Anoles

Jamaica

FIELD LEADER: DR. INBAR MAAYAN

Summer 2022

- Collecting data to study the phylogeography of Jamaican *Anolis* lizards.
- **Skills:** Anole data collection, transect sampling, lizard pole catching.

Undergraduate Research | UNC Asheville.

Asheville, NC

ADVISORS: DR. GRAHAM REYNOLDS

2019-2021

- **Senior Thesis:** “Characterized Complete Mitogenomes of the Critically Endangered Silver Boa and other Neotropical Boids using sequence data from UCE enrichment”
- Researched the ecology, evolution, and conservation of Caribbean boas and anoles using laboratory genetic methods.
- **Skills:** Geneious, MITOS Web Server, R, next-generation sequence data analysis, DNA extraction and purification, PCR, gel electrophoresis.

Field Research: Biology and Conservation of Turks Island Boas | UNC Asheville

Turks and Caicos

FIELD LEADER: DR. GRAHAM REYNOLDS

March 2020

- Radio tracked, captured, and collected morphological and spatial data from boas to inform conservation efforts of boa home ranges on Ambergris Cay, TCI.
- *Skills: Remote island fieldwork, radio telemetry, animal handling and data collection.*

NSF REU | Harvard University.

Cambridge, MA

ADVISORS: DR. HOPI HOEKSTRA, DR. BROCK WOOLDRIDGE

Summer 2019

- Investigated the extent of arboreal adaptation in rodents through a computational analysis of museum records.
- *Skills: R (multivariate statistical analysis, phylogenetic comparative methods), Excel.*

Publications

ACCEPTED/IN REVIEW

Vanerelli AA Maayan I, Taft JM, Bock D, Calder D, Losos JB, Geneva AJ. **In Review.** Phylogenomic relationships and sex chromosome evolution of the Jamaican Turquoise Anole (*Anolis grahami*). *BMC Genomics*.

Vásquez-Cruz V, Jauregui Bulbarela I, Morales-Leal IDJ, Sánchez-García JC, **Vanerelli AA**, Geneva AJ, Gray LN, Pavón-Vázquez CJ. 2026. Life underground: confirmation of oviparity in *Anelytropsis papillosus* (Dibamidae). *Bulletin of the Chicago Herpetological Society* 61(2).

PUBLISHED

Falvey CH, de Mello P, Taft JM, **Vanerelli AA**, Hime PM, Alexander AM, Glor RE, Geneva AJ. 2026. Chromosomal fusions and evolutionary forces: Exploring the neo-sex chromosome system of *Anolis distichus*. *Journal of Heredity*: esaf108.

Reynolds RG, Reger ME, Peek KJ, Raphael BL, Colosimo G, Miller AH, **Vanerelli AA**, Gerber GP. 2024. Spatial ecology of the Turks and Caicos Boa, *Chilabothrus c. chrysogaster* Cope, 1871 (Serpentes: Boidae) on Ambergris Cay, Turks and Caicos. *The Herpetological Journal* 34: 22-34.

Vanerelli AA, Miller AH, Comsa LC, Geneva AJ, Reynolds RG. 2022. Mitochondrial genome of the critically endangered Silver Boa (*Chilabothrus argentum*; Squamata: Boidae). *Mitochondrial DNA Part B* 7(6): 1180-1182.

Reynolds RG, Colosimo G, Peek K, **Vanerelli AA**, Bradley K, Gerber GP. 2020. *Chilabothrus chrysogaster chrysogaster* (Turks Island Boa). Diet. *Herpetological Review* 51(3): 610–611.

IN PREP

Vanerelli AA, Reynolds RG, Losos JB, Geneva AJ. In Preparation. Parallel evolution of large body size in *Anolis sagrei*.

Reynolds RG, McNeil W, **Vanerelli AA**, Miller AH. In preparation. Phylogenomic data resolve the West Indian Boa (Genus *Chilabothrus*) tree of life.

Awards, Fellowships, & Grants

2025	National Research Training Fellowship, CCIB	\$ 40,000
2024	Chancellor's Student Research Grant, Rutgers Camden	\$ 7,950
	National Research Training Fellowship, CCIB	\$ 40,000
	Travel Award, CCIB	\$ 1000
	Graduate Research and Travel Grant, Rutgers Camden	\$ 500
2023	National Research Training Fellowship, CCIB	\$ 38,000
	Third Place PhD Poster Award, CCIB	\$ 50
	Travel Award, CCIB	\$ 1000
	JMIH Travel Award, Society for the Study of Amphibians and Reptiles	\$ 500
	Graduate Research and Travel Grant, Rutgers Camden	\$ 500
2022	GRFP Honorable Mention, National Science Foundation	
2021	REPS Post Baccalaureate Fellowship, Rutgers Camden	\$ 64,882
	Manly E. Wright Valedictory Award, UNC Asheville	
	Harry Johnston Biology Award, UNC Asheville	
	University Research Scholar, UNC Asheville	
	Distinction in Biology, UNC Asheville	
	Chancellor's List (GPA 4.0), UNC Asheville	
2020	Chancellor's List (GPA 4.0), UNC Asheville	
2019	Research Experience for Undergraduates Fellowship, National Science Foundation	\$ 5000
	Dean's List (GPA >3.5), UNC Asheville	
2018	Chancellor's List (GPA 4.0), UNC Asheville	
	Dean's List (GPA >3.5), UNC Asheville	
	President's List (GPA 4.0), AB Tech	
2017	President's List (GPA 4.0), AB Tech	
	Dean's List (GPA >3.75), AB Tech	

Presentations

2025. **Vanerelli AA**, Reynolds RG, Losos JB, Geneva, AJ. Parallel Evolution of Large Body Size in *Anolis sagrei*. **Presented at Evolution, Oral Presentation.** CCIB Fall Poster Session, **Poster.**
2024. **Vanerelli AA**, Maayan I, Taft JM, Bock D, Losos J, Geneva AJ. High-quality Reference Genome for *Anolis grahami*. **Presented at Evolution, Oral Presentation.** CCIB Fall Poster Session, **Poster.**
2023. **Vanerelli AA**, Maayan I, Taft JM, Bock D, Losos J, Geneva AJ. High-quality Reference Genome for *Anolis grahami*. **Presented at CCIB Fall Seminar Series, Oral Presentation.** CCIB Fall Poster Session, **Poster.**
2023. **Vanerelli AA**, Reynolds RG, Losos JB, Geneva, AJ. Parallel Evolution of Large Body Size in *Anolis sagrei*. **Presented at Joint Meeting of Ichthyologists and Herpetologists, Oral Presentation.**
2022. **Vanerelli AA**, Maayan I, Taft JM, Bock D, Losos J, Geneva AJ. High-quality Reference Genome for *Anolis grahami*. **Presented at Joint Meeting of Ichthyologists and Herpetologists, Oral Presentation.**
2021. **Vanerelli AA** and Reynolds RG. Mitochondrial Genomes of 13 West Indian Boas. **Presented at University of North Carolina at Asheville Spring Research Symposium, Oral Presentation.**
2020. **Vanerelli AA**, Wooldridge TB, and Hoekstra HH. Finding Evidence for Arboreal Adaptation in Rodents Through an Unbiased Computational Analysis of Museum Records. **Presented at 4th Standalone Meeting of the Society of Systematic Biologists, Poster.**
2019. **Vanerelli AA**, Wooldridge TB, and Hoekstra HH. Finding Evidence for Arboreal Adaptation in Rodents Through an Unbiased Computational Analysis of Museum Records. **Presented at University of North Carolina Asheville Fall Undergraduate Research Symposium, Poster.** Hoekstra Lab Wondergrad Symposium at Harvard University, **Oral Presentation.** Summer Undergraduate Research Programs at Harvard University, **Poster.** Leadership Alliance National Symposium, **Poster.**

Teaching Experience

- FA 2022 **General Biology I Lab | Rutgers Camden**, Teaching Assistant
SP 2023 **General Biology II Lab | Rutgers Camden**, Teaching Assistant
2020-2021 **Principles of Zoology | UNC Asheville**, Teaching Assistant

Outreach & Professional Development

SERVICE AND OUTREACH

- 2022 **Rutgers-Camden Driving Change Initiative**, Team of faculty and students committed to driving genuine and lasting change so that STEM students from all backgrounds, especially historically excluded groups, will excel and graduate from college *Camden, NJ*
- 2019 **Full Moon Farm**, Animal care and husbandry. Non-profit organization committed to the rescue and care of wolfdogs. *Black Mountain, NC*

PROFESSIONAL MEMBERSHIPS

- 2024 **Open Consortium of Squamate Genomics**, A global initiative to increase both quality and quantity of lizard and snake genomic resources and their utility through collaboration and training efforts.
- 2024 **Society for the Study of Evolution**, Scientific society dedicated to the promotion of the study of organic evolution and the integration of the various fields of science concerned with evolution.
- 2023 **Society for the Study of Amphibians and Reptiles**, Scientific society dedicated to the research, conservation, and education concerning reptiles and amphibians.

References

Anthony J. Geneva, PhD | anthony.geneva@rutgers.edu

PHD AND POST-BACCALAUREATE RESEARCH ADVISOR

Assistant Professor of Biology, Center for Computational and Integrative Biology, Rutgers University Camden

R. Graham Reynolds, PhD | greynold@unca.edu

UNDERGRADUATE ACADEMIC AND RESEARCH ADVISOR

Associate Professor of Biology, Department of Biology, University of North Carolina at Asheville, Associate of Herpetology, Museum of Comparative Zoology, Harvard University

Hopi Hoekstra, PhD | hoekstra@oeb.harvard.edu

NSF REU RESEARCH ADVISOR

Professor of Molecular and Cellular Biology, Professor of Organismic and Evolutionary Biology, Howard Hughes Medical Institute Investigator, Harvard University

Jennifer Ward, PhD | jrward@unca.edu

UNDERGRADUATE ACADEMIC PROFESSOR

Professor of Biology, Department of Biology, University of North Carolina at Asheville