

Juniper A. Lake

University of Delaware, Newark DE
(602) 696-6843, dnovick@udel.edu
<https://juniper-lake.github.io/>
Previous names: Danielle Swanner/Novick

EDUCATION

Ph.D. Bioinformatics and Systems Biology , University of Delaware	GPA 4.0 2017 – Present
M.S. Plant Science , University of Delaware	GPA 4.0 2015 – 2017
B.S. Economics , The Wharton School of the University of Pennsylvania	GPA 3.7, magna cum laude 2009 – 2013
B.A. International Studies , University of Pennsylvania	GPA 3.7, magna cum laude 2009 – 2013

RELEVANT COURSES

Ph.D. Artificial Intelligence, Advanced Artificial Intelligence: Simulation and Modeling Bioinformatic Systems, Computational Biology and Bioinformatics, Databases for Bioinformatics, Systems Biology
M.S. Applied Plant Virology, Biological Control, Ecological Modeling, Genetics and Breeding, Genome Science: Technologies and Techniques, Insect Anatomy and Physiology, Insect Identification and Taxonomy, Introduction to Plant Physiology
B.S. Corporate Finance, Decision Processes, Introduction to Business Statistics, Leadership and Communication in Groups, Managerial Economics, Multivariable Calculus, Principles of Accounting, Risk Analysis and Management
B.A. Comparative Capitalist Systems, Emerging Economies, Human Rights and Globalization, Multinational Corporate Strategy, Monetary Economics and the Global Economy, Political Geography

RESEARCH AND TEACHING EXPERIENCE

Graduate Research Assistant	University of Delaware, Department of Animal and Food Sciences Sep 2017 – Present
<ul style="list-style-type: none">Conducting USDA-funded research on a novel and complex muscle disorder in broiler chickens called “wooden breast” that is currently causing major economic losses and welfare concerns in the poultry industry worldwide.Performing a genome-wide association study (GWAS) of wooden breast disease using genotyping by sequencing (GBS), RNA-sequencing (expression Quantitative Trait Loci analysis), and metabolomics data.Exploring the application of machine learning techniques to association studies to improve their predictive and statistical power.Developing open source computational tools to fulfill unmet needs in my research lab and in the broader field of bioinformatics.Mentoring undergraduate students that are doing research projects for an undergraduate thesis.	
Graduate Research Assistant	University of Delaware, Department of Plant and Soil Sciences Jun 2015 – Dec 2017
<ul style="list-style-type: none">Studied a fatal and widespread disease of landscape roses called rose rosette disease, which is caused by a multipartite virus and is vectored by an eriophyid mite. Rose rosette disease has no cure and causes extreme disfiguration of the plant and death within one to three years.Managed a large, randomized field trial to screen more than 200 genotypes of roses for resistance to rose rosette disease.Conducted experiments in transmission and biological control of rose rosette in an attempt to inform interim solutions for the disease before a successful breeding program for resistance comes to fruition.	
Graduate Teaching Assistant	University of Delaware, Plant and Soil Sciences Jan 2017 – May 2017
<ul style="list-style-type: none">Taught the weekly laboratory portion of Introductory Plant Pathology.Prepared fungal and bacterial cultures, maintained a steady supply of culture media, and oversaw student experiments.Graded student exams and lab reports, managed an undergraduate assistant, and collaborated on how the class could be improved.	
Propagation Intern	Morris Arboretum of the University of Pennsylvania Mar 2014 – Jun 2015
<ul style="list-style-type: none">Worked alongside the head plant propagator to manage the arboretum’s field nursery, Victorian Fernery, and state-of-the-art greenhouse complex and to propagate a wide variety of plants for use in the public areas of the arboretum.Developed a guide for identifying and managing the top greenhouse pests & diseases to serve as a reference for future employees.	
Undergraduate Teaching Assistant	University of Pennsylvania, Department of Biology Jan 2013 – May 2013
<ul style="list-style-type: none">Conducted review sessions, graded exams, and served as the main liaison for the course outside of lecture hours.Coordinated community service projects focused on urban agriculture and food justice in local Philadelphia schools. Helped students develop lesson plans and prepared them to interact with elementary and middle school students.	
Instructor	Philadelphia Freedom Schools & Agatston Urban Nutrition Initiative Oct 2009 – May 2013
<ul style="list-style-type: none">Developed and implemented daily lesson plans in math and literacy for second and third grade students and provided tutoring support for K-8th grade students at Henry C. Lea Elementary School.Facilitated conflict resolution and skill building. Taught an enrichment class that covered use of basic hand tools and promoted self-reliance.Led a class on mushrooms at Pepper Middle School during which students learned how to grow oyster mushrooms in coffee grounds.Helped build grow benches and refurbish the greenhouse that had fallen into disrepair at University City High School. Prepared herb seedlings and ornamental hanging baskets for sale and fundraising.	

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LEADERSHIP ROLES

- Chair of Communications Committee** Graduate Student Government | September 2018 - Present
Responsibilities include developing event advertisements and organizational branding, maintaining and updating the Graduate Student Government website, managing the Facebook and Twitter pages, and photographing events.
- Senator for Bioinformatics and Computational Biological Program** Graduate Student Government | May 2018 - Present
I attend all Graduate Student Government public meetings, vote on legislation, disseminate information and recommendations to my constituents, and advocate on behalf of social and professional programming for graduate students.
- Vice President** Bioinformatics Student Association | May 2018 – Present
Involved in organizing social and professional events, providing tutoring support to students, and acting as a line of communication between the program's administration and its students. Helped build a new website for the organization and redesigned its branding.
- Secretary** Bioinformatics Student Association | Sept 2017 – May 2018
Organized and advertised events, took minutes at officer meetings, and served as a resource to new students in the bioinformatics program.
- Dance Instructor, Event Coordinator, DJ** Jazz Attack & Powerhouse Blues | Aug 2015 – May 2017
Taught dance classes, helped organize large weekend dance events that hosted dancers from across the country, and DJed weekly dances at two organizations in Philadelphia that specialize in lindy hop, east coast swing, balboa, and blues.

PUBLICATIONS

Peer-Reviewed Journals

- Lake JA**, Dekkers JCM, Velleman SG, Brannick EM, and Abasht B. (2018) Blood gas disturbance and disproportionate body weight distribution in broilers with wooden breast. [In Prep]
- Wax J, Zhuo Z, Bower A, [and 9 others, including **Novick DN**] (2018) A problem-based learning exercise on food security: understanding the role of genomic variation and plant breeding. Genetics Society of America Peer-Reviewed Education Portal 004. doi: 10.1534/gsaprep.2018.004
- Byrne D, Klein P, Yan M, [and 7 others, including **Novick DN**] (2018) Challenges of breeding rose rosette resistant roses. HortScience 53:5. doi: 10.21273/HORTSCI12553-17.

Presentations

- Lake JA**, Velleman S, Brannick E, and Abasht B. Blood analysis and proportional muscle and organ weights in broilers with wooden breast. Poster presented at: Plant and Animal Genome Conference XXVII; 2019 Jan 12-16; San Diego, CA.
- Lake JA**, Tomlinson IV MJ, and Abasht B. FastqBLAST: A tool to quickly assess the organismal and genomic diversity present in a FASTQ file. Poster presented at: 26th Conference on Intelligent Systems for Molecular Biology; 2018 Jul 6-10; Chicago, IL.
- Behnam A, Dekkers JCM, Velleman SG, Schmidt C, and **Lake JA**. Genome wide identification and functional validation of genes causing susceptibility to wooden breast in commercial broiler chickens. Poster presented at: 2018 NIFA Joint Animal Nutrition, Growth and Lactation and Early Concept Grants for Exploratory Research (EAGERS) Project Director Meeting; 2018 Jun 12-13; Washington, DC.
- Novick DN**, Tomlinson IV M J, Papah MB, Chazi Capelo JD, and Abasht B. A new tool to prioritize candidate genes and characterize sample behavior in differential expression analysis of transcriptomic data. Poster presented at: Plant and Animal Genome Conference XXVI; 2018 Jan 13-17; San Diego, CA.
- Novick DN** and Evans T. Evaluation of rose germplasm for resistance to rose rosette disease. Poster presented at: American Phytopathological Society Potomac Division Meeting; 2017 Mar 22-24; Morgantown, WV.

Dissertations and Theses

- Novick DN**. Evaluation of rose germplasm for resistance to rose rosette disease and studies of disease transmission and vector control. (M.S. Thesis) Dec 2017. Research advisor: Tom Evans.
- Swanner DN**. B.S. Honors Thesis. Smallholder agroforestry programs: An instrument for mitigating supply chain risk. May 2013. Research advisor: R. Scott Poethig.

INDEPENDENT STUDY PROJECTS

- FastqBLAST Development** Fall 2018 | Advised by Adam Marsh
Created a program to assist in diagnosing issues associated with low mapping rates of sequencing reads to a reference genome. The program can quickly assess the genomic and organismal diversity of a FASTQ file from a personal computer by invoking NCBI's servers over the internet.
- Population Genetics Analysis of Maize in Python** Spring 2017 | Advised by Randall J. Wisser
Wrote a program to simulate genetic recombination in an F2 population of maize, compare simulated allele frequencies to observed genotyping by sequencing (GBS) data, and model loci along each chromosome where allele frequencies differed significantly from expected.

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HONORS AND AWARDS

Sep 2018 **Unique Strengths Fellowship** from University of Delaware College of Agriculture and Natural Resources
Jul 2018 **Summer Institutes Scholarship** from University of Washington Department of Biostatistics
Jul 2018 **Professional Development Award** from University of Delaware Office of Graduate and Professional Education
Apr 2018 **Summer Doctoral Fellowship** from University of Delaware Office of Graduate and Professional Education
Mar 2018 **1st place in Regional Linnaean Games (insect trivia)** at Entomological Society of America's Eastern Branch Meeting
Feb 2018 **I-Corps Sites Grant** from National Science Foundation (NSF)
Jan 2018 **Neal A. Jorgenson Genome Travel Award for Bioinformatics** from Plant and Animal Genome Conference XXVI
Nov 2017 **3rd place in National Linnaean Games (insect trivia)** at Entomological Society of America's National Meeting
Mar 2017 **2nd place in Regional Linnaean Games (insect trivia)** at Entomological Society of America's Eastern Branch Meeting
May 2013 **Dean's List** and **The Wharton School Dean's List** for 2009-2010, 2011-2012, and 2012-2013

TECHNICAL SKILLS

Scripting/ programming	Python (excellent), R (excellent), Perl (familiar)
OS	Linux (excellent) environment in HPC cluster with Slurm Workload Manager, macOS, Windows
Markup	HTML, LaTeX, Markdown, R Markdown
Bioinformatics programs	BLAST, Cuffdiff, Cytoscape, FastQC, HISAT, MEME Suite, SAMtools, TSSPredator
Version control	Git, GitHub
Other programs	Adobe Illustrator, Adobe Photoshop, JMP Statistical Software, MySQL
Wet lab	DNA and RNA extraction, DNA-Seq and RNA-Seq library preparation, PCR
General skills	Writing and testing software, Building pipelines, Analyzing and interpreting large 'omics datasets

PERSONAL INTERESTS

Swing dancing	Balboa, Blues, Charleston, East coast, Lindy hop, Shag
Rock climbing	Bouldering, Sport climbing, Top-rope
Banjo	Bluegrass (Melodic and Scruggs), Clawhammer
Other	Cooking and baking, Recreational road and mountain biking

WORKSHOPS AND ADDITIONAL TRAINING

Summer Institute in Statistical Genetics (SISG 2018). Association mapping: Genome wide association studies and sequencing data, Computational pipeline for whole genome sequencing data, Advanced quantitative genetics, Statistical and quantitative genetics of disease. University of Washington, Seattle, (July 16-27, 2018).

Intelligent Systems in Molecular Biology (ISMB 2018). Machine learning methods in the analysis of genomic and clinical data, Visualization of large biological datasets. Chicago, Illinois, (July 6-10, 2018).

Entomology 2017. Making the switch: A beginner's guide to R for those familiar with other packages. Denver, Colorado, (November 5-8, 2017).
*Volunteered as a teaching assistant to troubleshoot programming issues during the workshop.

Software Carpentry. Programming with Python, Version control with Git, The Unix shell. University of Delaware, Newark, (August 14-15, 2017).

Genomics Data Carpentry. Project organization and management for genomics, Introduction to the command line for genomics, Data wrangling and processing for genomics, Introduction to cloud computing for genomics. University of Delaware, Newark, (March 29, 2017).

MEMBERSHIP IN PROFESSIONAL SOCIETIES AND ASSOCIATIONS

International Society for Computational Biology (2017 – Present)
Poultry Science Association (2017 – Present)
Entomological Association of America (2017 – Present)
American Phytopathological Society (2015 – 2017)