Ellie Taagen

Quantitative Geneticist • Recombination Scientist • USA & EU citizen

240 Emerson Hall, Cornell University, Ithaca, NY, 14853, USA

+1 (206) 830-0328 | et395@cornell.edu | etaagen.github.io | etaagen | ellie-taagen | @etaagen | given name Ella

Summary

As a quantitative geneticist, I love to discover the relationships between recombination variation and desirable phenotypes and am driven by their potential to enhance breeding pipeline efficiency and genetic gain. Detail oriented planning and interdisciplinary communication are core pillars of my creative and critical thinking approach to problem solving. I am pursuing a Ph.D. in Plant Genetics at Cornell University with an expected graduation spring 2022, and am drawn to career paths in industry at the intersection of genetics, data science, and molecular biology.

Expertise

Quantitative Genetics	whole genome associations, genomic selection, causal variant identification, multi-omics analysis
Recombination Science	meiosis domain knowledge, controlled recombination mechanisms, applied haplotype breeding
Molecular Biology	experimental design, primer optimization, gene editing domain knowledge, agrobacterium transformation
Programming	R, Linux, SQL, LaTeX, Git, bioinformatics tools, algorithm workflow development, cloud computing
Data Science	simulations, reproducible analyses, skillful data visualization, large dataset management (17 Gb)
Soft Skills	multi-disciplinary communication, project management, team leader, creative problem solver

Education

Ph.D. in Plant Genetics — *Ithaca, NY, USA*

Cornell University — *2017 - May 2022*

- Minors: Plant Molecular Biology and International Agriculture and Rural Development

B.S. in Molecular, Cellular, Developmental Biology — *Seattle, WA, USA*

University of Washington — *2012 - 2016*

- Minor: Nutritional Sciences

Relevant Experience

Data Science intern | Genomics Discovery and Application team — *Bayer Crop Science*

Characterizing recombination rate variation and associated haplotypes — *2021 - Present*

- Measuring recombination as a phenotype and applying GWAS to identify haplotypes that may impact recombination in maize cohorts.
- Developing a data set agnostic workflow in order to provide recommendations of haplotype selection, or which controlled recombination technologies to apply.
- Six-month, full-time position exposure to multi-disciplinary team-based projects and industry-paced research setting.

Ph.D. research | advisor Dr. Jean-Luc Jannink — *Cornell University*

Simulating controlled recombination in allopolyploid genomes — *2020 - Present*

- Leveraging simulation and bioinformatics tools to better understand controlled recombination's (Taagen et al. 2020) potential to reveal currently inaccessible genetic diversity and innovate increased control over the inheritance of preferred haplotypes.
- Exploring the biological constraints of meiotic recombination, gamete segregation, genome editing, and prediction-based decisions in a plant breeding simulation context.
- Designing novel methods that compare efficiency of cost of traditional breeding to controlled recombination.

Ph.D. research | advisor Dr. Mark Sorrells — *Cornell University*

Identifying genomic structural variant barriers to gene positional cloning — *2017 - 2021*

- Applied traditional population development strategies, along with cutting-edge tools in genomics and transcriptomics to better understand the landscape of causal variation based breeding decisions. Talk video link, peer feedback: **4.8/5**
- Determined that chromosome structural variants can overpower traditional fine-mapping approaches to gene discovery, especially in polyploids, and proposed recommendations for new experimental design standards.
- Results published in (Taagen et al. 2021) and all analysis conducted is reproducible and publicly available as a learning resource at: github.com/etaagen.

Post-baccalaureate RA | advisor Dr. Stephen Jones — *Washington State University*

Breeding value chain engagement — *2016 - 2017*

- Surveyed and engaged supply chain stakeholders and end-users when setting objectives for small grains breeding program.
- Delivered lab and field support for graduate student breeding projects sourced from a broad base of genetic diversity.

Mentorship & Management

Corteva Agriscience and Cornell School of Integrative Plant Science (SIPS) networking *Virtual*

Coordinator *2020 - Present*

- Built network and relationship pipeline with Corteva Global Academic Relations Manager and Cornell SIPS industry partnerships liaison.
- Developed system for matching 50 graduate students with Corteva scientists based on shared career interests.

Diversity and Inclusion Committee, SIPS Cornell *Cornell University*

Graduate Student Representative *2020 - 2021*

- Facilitate monthly meetings, titled OpenUpSTEM, which provide a space for graduate students to learn about, discuss, and take action towards building a sustainable culture of anti-racism in our community.

Synapsis, Plant Breeding and Genetics GSA *Cornell University*

President *2019-2020*

- Executed 2020 graduate student recruitment visitation for 15 students.
- Oversaw communication between current plant breeding and genetics students and faculty.

Plant Breeding and Genetics faculty search committee *Cornell University*

Graduate Student Representative *2019-2020*

- Screened and evaluated 54 applicant packages, and conducted full day interviews with top 3 candidates (research /teaching /chalk-talk).
- Facilitated graduate student meetings with top candidates and documented graduate student preferences for clear communication to faculty.

Graduate student mentor *Cornell University*

Undergraduate research assistants *2018-2020*

- Hired, trained, and mentored three talented undergraduate research assistants and supervised one honors thesis
- Coached one graduate school application and interview process, accepted to five plant sciences PhD programs.

Bonsai Professional Coaching Service *Virtual*

Mentee *2018-2020*

- Partnered with leadership coach Loriana Sekarski to identify and apply personalized Clifton Strengths by Gallup, top 5 strengths: **achiever, learner, analytical, futuristic, individualization**.
- Trained in STEM industry professionalism and charted conflict management strategies.

Awards & Scholarships

2022	**IWGSC Early Career Award**, Plant and Animal Genome conference travel stipend	*San Diego, CA*
2021	**Munger Murphy Graduate Student Award**, Cornell PBG	*Ithaca, NY*
2021	**WIT Early Career Award**, Borlaug Global Rust Initiative	*Virtual*
2020	**Borlaug Scholar**, National Association of Plant Breeders	*Virtual*
2020	**3rd Place**, C7 Plant and Animal Genome conference poster competition	*San Diego, CA*
2019	**Awardee**, Cornell IARD winter interim travel grant	*Kerala, India*
2018	**Awardee**, ASA, CSSA and SSSA Congressional Visit Day travel grant	*Washington DC*
2018	**Future Leader in Science**, ASA, CSSA and SSSA	*Washington DC*

Relevant Workshops

Enrolled	**Data Camp**, Python, SQL, Machine Learning	*Virtual*
2020	**Collaborative and Reproducible Data Science in R**, NTRES 6940	*Cornell University*
2019	**Linux for Biologists**, Institute of Biotechnology	*Cornell University*
2018	***Breeding for Quantitative Traits in Plants***, book club facilitator	*Cornell University*
2017	**Tucson Plant Breeding Institute**, quantitative genetics bootcamp	*Cornell University*

Publications

Taagen, E., J., Gul, A., & Sorrells, M. E. *Positional based cloning "fail-safe" approach is overpowered by wheat (Triticum aestivum) chromosome structural variation.* **(2021)** The Plant Genome

Taagen, E., Bogdanove, A. J. & Sorrells, M. E. *Counting on Crossovers: Controlled Recombination for Plant Breeding.* **(2020)** Trends in Plant Science

Taagen, E., Bogdanove, A. J. & Sorrells, M. E. *Achieving Controlled Recombination with Targeted Cleavage and Epigenetic Modifiers.* **(2020)** Trends in Plant Science

Sweeney, D. W., Sun, J., **Taagen, E.** & Sorrells, M. E. *Genomic Selection in Wheat.* (Woodhead Publishing. **(2019)** in Applications of Genetic and Genomic Research in Cereals, 273-302