

# Ellie Taagen

QUANTITATIVE GENETICIST • DATA SCIENTIST • USA & EU CITIZEN

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## 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

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

## Education

### Ph.D. in Plant Genetics

CORNELL UNIVERSITY

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

Ithaca, NY, USA

2017 - May 2022

### B.S. in Molecular, Cellular, Developmental Biology

UNIVERSITY OF WASHINGTON

- Minor: Nutritional Sciences

Seattle, WA, USA

2012 - 2016

## 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](https://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.

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

## Relevant Workshops

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