

# Ellie Taagen, PhD

GENOMICS • DATA SCIENCE • PROJECT LEADERSHIP

Seattle, WA • USA & EU citizen

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## Summary

As a data scientist, I love to model and test the relationships between regulatory genomic features and desirable phenotypes, and seek to further leverage their potential to enhance variant discovery and breeding pipeline efficiency with genome editing. Openness, adaptability, and interdisciplinary communication are core pillars of my creative and critical thinking approach to problem solving and project leadership. I am drawn to career paths on research and development teams in the biotech industry at the intersection of genomics, data science, and project leadership.

## Expertise

<b>Genomics</b>	functional genomic sequence analyses and annotation, causal variant discovery, meiosis domain knowledge
<b>Genome Editing</b>	gRNA selection, multiplex editing, promoter bashing, automated advancements, experimental design
<b>Data Science</b>	R, Linux, SQL, Git, statistical analyses, skillful visualization, flexible simulations, reproducible analyses and tools
<b>Project Leadership</b>	sprints, aligning with organizations, outlining future state, driving engagement, facilitating change, recruitment
<b>Communication</b>	presentations, white papers, active listening, decisive, authentic, agile, adaptive, perceptive, self aware

## Education

### Ph.D. in Plant Genetics

CORNELL UNIVERSITY

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

Ithaca, NY, USA

2017 - 2022

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

UNIVERSITY OF WASHINGTON

- Minor: Nutritional Sciences

Seattle, WA, USA

2012 - 2016

## Technical Experience

### Data Scientist | Crop Genome Editing team

DESIGN, UTILIZATION, AND ANALYSIS OF MULTIPLEX GENOME EDITING PIPELINE

- Answered "what to edit" via collaborative models that query relevant functional genomic features of genome editing targets.
- Lead projects with team of 6 data scientists to develop novel experiments that set multiplex editing and advancement pipeline foundation.
- Met shared goals with molecular biologists, IT, and data engineers via interdisciplinary communication, standing meetings, and presentations.

Bayer Crop Science

2022 - Present

### Data Science intern | Genomics Discovery and Application team

CHARACTERIZATION OF RECOMBINATION RATE VARIATION AND ASSOCIATED HAPLOTYPES

- Measured recombination as a phenotype and applied GWAS to identify haplotypes that may impact recombination in maize cohorts.
- Developed 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.

Bayer Crop Science

2021

### Ph.D. research | advisor Dr. Jean-Luc Jannink

SIMULATED CONTROLLED RECOMBINATION IN ALLOPOLYPLOID GENOMES

- Leveraged 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.
- Explored the biological constraints of meiotic recombination, gamete segregation, genome editing, and prediction-based decisions in a plant breeding simulation context.
- Designed novel methods that compare efficiency and cost of traditional breeding to controlled recombination.

Cornell University

2020 - 2022

### Ph.D. research | advisor Dr. Mark Sorrells

IDENTIFICATION OF GENOMIC STRUCTURAL VARIANT BARRIERS TO GENE POSITIONAL CLONING

- 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. [IWGSC webinar link](#)
- 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 analyses conducted is reproducible and publicly available as a learning resource at: [github.com/etaagen](https://github.com/etaagen).

Cornell University

2017 - 2021

## Mentorship & Management

### Recombination Working Group

Bayer Crop Science

CO-LEADER

2022 - Present

- Co-lead monthly meetings for group of 20 interdisciplinary PhD scientists, coordinate group goals, develop trust, and take action towards groundbreaking proof of concept projects.

### Diversity and Inclusion Committee, SIPS Cornell

Cornell University

GRADUATE STUDENT REPRESENTATIVE

2020 - 2021

- Facilitated 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.

### 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.

### Graduate Women in Science

Cornell University

EXECUTIVE OF ONLINE COMMUNICATIONS

2017-2019

- Operated digital outreach and authored biweekly newsletter for >400 listserv members.
- Devised and improved advocacy, educational, and social events based on polled membership interests.

## 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

2022	<b>HFP consulting</b> , Young Female Leaders in Science, 3-day workshop participant	Des Moines, IA
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
2019	<b>Cornell IARD</b> , tours of farms and research stations in Kerala and Telangana, 3 weeks	India
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.**, Jordan, K., Akhunov, E., Sorrells, M. E. & Jannink, J. L. *If It Ain't Broke, Don't Fix It: Evaluating the Effect of Increased Recombination on Response to Selection for Wheat Breeding.* (2022) [G3](#)

**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](#)