

# Ellie Taagen

QUANTITATIVE GENETICIST · DISCOVERY SCIENTIST · USA & EU CITIZEN

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## Education

### Cornell University

PH.D. IN PLANT GENETICS

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

Ithaca, NY, USA

2017 - expected 2022

### University of Washington

B.S. IN MOLECULAR, CELLULAR, DEVELOPMENTAL BIOLOGY

- Minor: Nutritional Sciences

Seattle, WA, USA

2012 - 2016

## Research Experience

### Simulating controlled recombination in allopolyploid genomes

PH.D. | ADVISOR DR. JEAN-LUC JANNINK

- Leveraging simulation and bioinformatics tools to better understand controlled recombination's potential to reveal currently inaccessible genetic diversity and innovate increased control over the inheritance of preferred haplotypes.
- Exploring the biological constraints of meiotic recombination and prediction-based decisions in a plant breeding context.

Cornell University

2020 - Present

### Identifying genomic structural variant barriers to gene positional cloning

PH.D. | ADVISOR DR. MARK SORRELLS

- 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.

Cornell University

2017 - Present

### Breeding value chain engagement

POST-BACCALAUREATE RA | ADVISOR DR. STEPHEN JONES

- Surveyed and engaged supply chain stakeholders 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.

Washington State University

2016 - 2017

### Characterizing circadian rhythm mechanisms of growth-phase transitions in Arabidopsis

UNDERGRADUATE RA | ADVISOR DR. TAKATO IMAIZUMI

- Assessed mechanistic sequence of genes involved in vegetative to reproductive growth transition and characterized circadian rhythm gene.
- Showcased at undergraduate research symposium.

University of Washington

2015 - 2016

### Investigating tuberculosis drug discovery

UNDERGRADUATE LAB ASSISTANT | DR. DAVID SHERMAN

- Supported communication between researchers and maintained solution stocks for the lab at the Center for Global Infectious Disease Research.
- Developed a standardized protocol for unique growth media based on experimental design.

Seattle, WA

2013 - 2014

## Expertise

### Quantitative Genetics

genome to phenome modeling, structural variant identification, reference genome database mining and navigation, fine-mapping, QTL mapping, GWAS, RNA-seq analysis, allopolyploid, research-based summary statistics

### Programming

R, Python, Linux command line, LaTeX, skillful data visualization

### Data Science

reproducible analyses, Git, multi-omics data, management of whole transcriptome sequencing (17 Gb genome)

### Statistics

experimental design, analysis of variance, generalized linear and mixed model, principle component analysis, multi-dimensional data analysis, model comparisons, supervised statistical learning

### Plant breeding

mapping population development (>7,000 lines), tissue culture/ growth chamber/ greenhouse/ field, cereal crossing techniques, marker assisted and phenotypic selection, value chain extension

### Molecular Biology

DNA/RNA extraction, primer design/optimization, PCR, gel electrophoresis, agrobacterium transformation

### Soft Skills

interdisciplinary communication, project management, team leader, creative problem solver, hire/ on-board/ mentor, relationship building, listserv/ social media management

## Publications

**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

Song, Y.H. *et al.* *Molecular basis of flowering under natural long-day conditions in Arabidopsis*. (2018) *Nature Plants*

## Awards & Scholarships

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

## Presentations

**Topic:** Counting on Crossovers: fine-mapping a kernel weight and morphology gene in wheat

2020	<b>Plant and Animal Genome Conference</b> , poster pdf	San Diego, CA
2019	<b>ASA/CSSA/SSSA annual meeting</b> , talk video link	San Antonio, TX
2019	<b>Cornell Plant Breeding and Genetics seminar</b> , talk video link, peer feedback: 4.8/5	Ithaca, NY

**Topic:** Dissecting yield: fine-mapping grain weight and shape genes in spring wheat

2019	<b>Grass Group</b> , Cornell University seminar series	Ithaca, NY
2018	<b>Cornell Plant Breeding and Genetics seminar</b> , talk video link, peer feedback: 4.6/5	Ithaca, NY

**Topic:** Fine-mapping grain weight and shape QTL in spring wheat

2018	<b>ASA/CSSA annual meeting</b> , poster abstract	Baltimore, MD
2018	<b>Plant and Animal Genome Conference</b> , annual grant meeting talk	San Diego, CA

### Outreach

-	<b>Twitter @etaagen</b> , audience: geneticists, breeders, graduate students	-
2018	<b>Grow NYC Variety Showcase</b> , audience: chefs, bakers, consumers	NYC, NY
2018	<b>ASA/CSSA/SSSA congressional visit days</b> , audience: congressperson and staff	Washington DC
2018	<b>Cornell Botanical Garden Judy's day</b> , audience: children and families	Ithaca, NY
2018	<b>Cornell small grains field days</b> , audience: farmers, seed companies, extension agents	Ithaca, NY

## Teaching Experience

### Laboratory in Genetics and Genomics graduate TA

Cornell University

COURSE BIOMG 2801

2021

- Taught lecture and hands-on-learning for gene cloning, gene mapping, and CRISPR-Cas9 research applications

### Methods of Plant Breeding curriculum design & guest lecture

Cornell University

COURSE PLBRG 4060

2019

- Created and taught lecture and hands-on-learning for fine-mapping/cloning with Dr. Shantel A. Martinez
- View [lecture & exercise](#)

### Graduate student mentor

Cornell University

CORNELL SMALL GRAINS LAB

2018-2020

- Hired, trained, and mentored three undergraduate research assistants

## Mentorship & Management

## Corteva 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.
- Served on the SIPS graduate student council.
- Co-authored survey and visualized results to assess SIPS graduate student satisfaction and concerns with unification of the five sections, career path exploration, mental health resources and inclusion initiatives.

## Plant Breeding and Genetics faculty search committee

Cornell University

COMMITTEE MEMBER, 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.

## ASA, CSSA and SSSA annual leadership conference

San Antonio, TX

ACCEPTED APPLICANT

2019

- Trained in STEM industry professionalism and charted conflict management strategies.
- Learned personal DiSC assessment and tools for engaging successfully with all DiSC personalities.

## Jannink/Sorrells lab meetings

Cornell University

COORDINATOR

2018-Present

- Streamlined meeting schedule and presentation rotations with access to centralized Google drive for 18 people across 2 lab groups.
- Unified communication across listserv, Slack, and Zoom.

## Graduate student mentor

Cornell University

UNDERGRADUATE PLANT SCIENCE SENIOR HONORS THESIS

2018-2019

- Trained talented young scientist and supervised honors thesis, titled *Fine-mapping wheat grain weight and length QTL on chromosome 2D*.
- Coached 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 five strengths: *Learner, Achiever, Focus, Communication, Individualization*.

## 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.

## Pioneer Symposium

Cornell University

ORGANIZING COMMITTEE

2017-2018

- Coordinated symposium theme and speaker nominations, and established location to seat >200 attendees with technical support.
- Revitalized networking and panel event to highlight and discuss groundbreaking plant breeding innovations

## Relevant Workshops

Enrolled **Statistical Learning**, ten-week course

edX Stanford

Online

Virtual

2020 **Bayer Professional Development**, NAPB

Ithaca, NY

2020 **Collaborative and Reproducible Data Science in R**, Cornell NTRES 6940

Ithaca, NY

2019 **Linux for Biologists**, Cornell University Institute of Biotechnology

India

2019 **Cornell IARD**, tours of farms and research stations in Kerala and Telangana, 3 weeks

2018 **Finding Your Research Voice**, science communications and presentations

Ithaca, NY

2018 **Story Collider**, writing true, personal stories about science

Ithaca, NY

2018 **Breeding for Quantitative Traits in Plants**, book club facilitator

Ithaca, NY

2017 **Tucson Plant Breeding Institute**, quantitative genetics bootcamp

Ithaca, NY

## Affiliations & Memberships

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- **National Association of Plant Breeders**, student member, 2020-Present
- **Theoretical and Applied Genetics**, peer reviewer, 2019
- **Crop Science Society of America**, student member, 2017-Present