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

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

Education

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

Cornell University — *2017 - 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

Technical Experience

Data Scientist | Crop Genome Editing team — *Bayer Crop Science*

Design, utilization, and analysis of multiplex genome editing pipeline — *2022 - Present*

- 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.

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

Characterization of recombination rate variation and associated haplotypes — *2021*

- Measured recombination as a phenotype and applyied 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.

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

Simulated controlled recombination in allopolyploid genomes — *2020 - 2022*

- 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.

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

Identification of 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. 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.

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.

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.

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	**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

2022	**HFP consulting**, Young Female Leaders in Science, 3-day workshop participant	*Des Monies, IA*
2020	**Collaborative and Reproducible Data Science in R**, NTRES 6940	*Cornell University*
2019	**Linux for Biologists**, Institute of Biotechnology	*Cornell University*
2019	**Cornell IARD**, tours of farms and research stations in Kerala and Telangana, 3 weeks	*India*
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., Jordan, K., Akhunov, E., Sorrells, M. E. & Jannink, JL *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