

Hannah Rae Thomas
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HannahRaeThomas.com

Education

- Doctor of Philosophy in Plant Biology | USDA AFRI-NIFA Predoctoral Fellow** **May 2022**
Cornell University, 300 Day Hall, 10 East Avenue, Ithaca, NY 14852
GPA: 3.9
- Bachelor of Science in Biology** **July 2017**
Pittsburg State University, 1701 S Broadway St, Pittsburg, KS 66762.
Minor: Chemistry | Emphasis: Molecular plant biology and plant physiology
GPA: 3.98 | Credits: 156 | Summa Cum Laude

Research Experience

- John Innes Centre**, Post-Doctoral Research Scientist **6/2022- Current**
Department of Cell and Developmental Biology, Laboratory of Dr. Christine Faulkner (christine.faulkner@jic.ac.uk)
Focus: intercellular communication, plant-pathogen interactions, long-distance signaling
- Cornell University**, Ph.D. Candidate and USDA AFRI-NIFA Predoctoral Fellow **7/2018-05/2022**
School of Integrative Plant Science, Laboratory of Dr. Margaret Frank (mhf47@cornell.edu)
Thesis: *Understanding the Role of Intercellular Communication in Vegetable Crop Grafting*
Focus: plant grafting, GM crop generation, and biotechnology
- Boyce Thompson Institute and Cornell University**, Ph.D. Intern **1/2018-6/2018**
School of Integrative Plant Science, Laboratory of Dr. Joyce Van Eck (jv27@cornell.edu)
Project: *Formal training on Solanaceous plant transformation and tissue culture*
Focus: GM crop generation and tissue culture
- Boyce Thompson Institute and Cornell University**, Ph.D. Intern **8/2017-12/2017**
School of Integrative Plant Science, Dr. James Giovanonni, (jgg33@cornell.edu)
Project Title: *Gene expression in Coffea arabica fruit development*
Focus: Genomics and fruit development
- Donald Danforth Plant Science Center**, Undergraduate Research Assistant (NSF REU) **5/2016-8/2016**
Laboratory of Dr. Blake Meyers (BMeyers@danforthcenter.org)
Project Title: *Functional analysis of phasiRNA in soybean anthers*
Focus: Bioinformatics, genomics
- Pittsburg State University** Undergraduate Research Assistant **1/2016-7/2017**
Department of Biology, Laboratory of Dr. Virginia Rider (VRider@pittstate.edu)
Thesis title: *The spatial expression of the T cell homing receptor, CCR7 and T cells marker, FoxP3 are differentially regulated by progesterone and estradiol in the rat uterus*
Focus: proteomics and immunohistochemistry

Work Experience

- Instructor/Research Writer** **10/20120-11/2021**
Garden Streets | Gardenstreets.com
- Taught over 200 plant science classes to employees from corporations like Starbucks, Google, LinkedIn, etc.
 - 5 hours/week; supervised by CEO Jen Gouldstome (jen@gardenstreets.com)
- United States Department of Agriculture AFRI-NIFA Predoctoral Research Fellow** **01/2020-Current**
- Conducted scientific research on plant grafting.
 - 40 hours/week; supervised by Dr. Margaret Frank (mhf47@cornell.edu)
- Cornell University School of Integrative Plant Science Teaching Assistant** **08/2018-1/2020**
- Taught 3 semesters: Field Crop Systems for Dr. Tim Setter (tls1@cornell.edu), Plant Physiology for Tom Silva (ts21@cornell.edu), and Introductory Plant Biodiversity and Evolution for Dr. Margaret Frank (mhf47@cornell.edu)
 - 20 hours/week research and 20 hours/week teaching
- Cornell University School of Integrative Research Assistant** **08/2017-08/2018**
- Attended classes and took part in 3 research rotations.
 - 10 hours/week course work and 30 hours/week research

- Supervised by Plant Biology graduate field assistant (kpg2@cornell.edu) and director of graduate studies Dr. Mike Scanlon (mjs298@cornell.edu)

Relevant Pro Bono Experience

American Society of Plant Biology Ambassador

02/2022-Current

- Communicate the mission and vision of the Society to other plant biologists and the general public
- Engage their campus communities in outreach activities, represent ASPB at section conferences, and contribute articles to the ASPB News

Advancing Science and Policy Federal Relations Liaison

08/2021-Current

Cornell University

- Acted as the contact point between Federal Relations in Washington D.C. and Cornell University STEM graduate students
- Organized seminars on science in the government, science communication, and visits to D.C.

Associate Editor

05/2021-Current

Journal of Science Policy and Governance

- Curated and edited issues of the JSPG during the 2021-2022 school year

Skills

DNA/RNA Manipulation: Crisper technology, plasmid, genomic DNA, total RNA extraction, electrophoresis, plasmid vector construction, primer design, PCR and qPCR, site-specific mutation, gene positioning. Proficiency in the use of various conventional laboratory instruments.

Protein manipulation: RNA immunoprecipitation, SDS-PAGE and staining, bacterial expression and purification, Western-blot, luciferase complementary technology (LCI assay).

Plant Grafting: Bench and field grafting for herbaceous and woody crops.

Plant physiology techniques: Arabidopsis, Tomato, and various Solanaceae *Agrobacterium tumefaciens* mediated transformation; cell- and tissue-culture.

Histology: Tissue embedding and sectioning (microtome and cryotome), histochemical staining (traditional, fluorescent, and mobile dyes.)

Imaging: Light microscopy, fluorescent microscopy, confocal microscopy

Genomics and Bioinformatics: Proficient in Linux/UNIX environment and R, proficient in use of commonly used biological software such as MEGA, commonly used databases such as NCBI-PubMed, and tools such as Google Scholar and Endnote/Mendeley/Zotero.

Data Analysis: R, Linux/UNIX, bio-statistics, ImageJ/Fiji, nucleic acid and protein sequence similarity analysis, phylogenetic tree construction, protein secondary structure and tertiary structure prediction,

Communication: Advanced knowledge in media design, proven oral and written communication skills (both to technical and general audiences), beginner in spoken and written Mandarin Chinese

Leadership: Excellent team player, collaborative worker, self-starter, has held multiple leadership positions during Ph.D. (Advancing Science and Policy – Board Member; Plant Biology Graduate Student Association – Treasurer, etc.)

Publications

Thomas, H., Gevorgyan, A., and Frank, M. (2022). Anatomical and biophysical characterization of intergeneric graft-incompatibility within the Solanoideae. bioRxiv.

Thomas, H.R., McCloskey, E. and Rider, V. (2022). Pregnancy Preparation: Redistribution of CCR7 Positive Cells in the Rat Uterus. Reproduction.

Thomas, H.R., Van den Broeck, L., Spurney, R., Sozzani, R., Frank, M.H. (2021). Gene regulatory networks for compatible versus incompatible grafts identify a role for SIWOX4 during junction formation. The Plant Cell.

Yue, Y., Du, J., Li, Y., **Thomas, H. R.**, Frank, M. H., Wang, L., & Hu, H. (2021). Insight into the petunia Dof transcription factor family reveals a new regulator of male-sterility. Industrial Crops and Products.

Chen, C., Chen, H., Zhang, Y., **Thomas, H.R.**, Frank, M.H., He, Y., Xia, R. (2020) "TBtools, a toolkit for biologists integrating various biological data handling tools with a user-friendly interface." Molecular Plant,

Thomas, H. R., & Frank, M. H. (2019). Connecting the pieces: uncovering the molecular basis for long-distance communication through plant grafting. New Phytologist.

Select Conference Presentations and Invited* Seminars

Oral Presentations

- Thomas, H.R.**, Frank, M.H. "Understanding the role of cellular processes in grafted crops. January 2022. Plant Vascular Biology. Berlin, Germany.
- ***Thomas, H.R.**, Van den Broeck, L., Spurney, R., Sozzani, R., Frank, M.H. Gene regulatory networks for compatible versus incompatible grafts identify a role for SIWOX4 during junction formation. January 2022. University of Delaware. Newark, DE
- ***Thomas, H.R.**, Van den Broeck, L., Spurney, R., Sozzani, R., Frank, M.H. Gene regulatory networks for compatible versus incompatible grafts identify a role for SIWOX4 during junction formation. January 2022. University of Delaware. Newark, DE.
- ***Thomas, H.R.**, Van den Broeck, L., Spurney, R., Sozzani, R., Frank, M.H. Gene regulatory networks for compatible versus incompatible grafts identify a role for SIWOX4 during junction formation. (Virtual- January 2022) Plant and Animal Genome.
- ***Thomas, H.R.**, Van den Broeck, L., Spurney, R., Sozzani, R., Frank, M.H. Gene regulatory networks for compatible versus incompatible grafts identify a role for SIWOX4 during junction formation. October 2021. Pittsburg State University, Pittsburg, KS.
- Thomas, H.R.**, Van den Broeck, L., Spurney, R., Sozzani, R., Frank, M.H. Gene regulatory networks for compatible versus incompatible grafts identify a role for SIWOX4 during junction formation. (Virtual- July 2021) Plant Biology.
- Thomas, H.R.**, Frank, M. Pepmato: a potential model for graft incompatibility (April 2019). Plant Biology, Cornell University, Ithaca, New York.

Poster Presentations

- Thomas, H.R.**, Van den Broeck, L., Spurney, R., Sozzani, R., Frank, M.H. WOX4 is involved in graft junction formation in Solanaceae (Virtual- August 2020). Sainsbury Lab Symposium
- Thomas, H.R.**, Van den Broeck, L., Spurney, R., Sozzani, R., Frank, M.H. Pepmato, Tomepper, and the Visualization of Graft Incompatibility (Virtual- July 2020). Plant Biology 2020.
- Thomas, H.R.**, Frank, M. Pepmato: a potential model for graft incompatibility (June 2019). Plant Vascular Biology Meeting, Asilomar, California
- Thomas, H.R.**, Teng, C. Meyers, B. Functional analysis of anther phasiRNA in soybean. (2017, January). Plant and Animal Genome Conference, San Diego, California (2017, February). Pittsburg State Research Colloquium 2017, Pittsburg, Kansas.

Grants and Awards

Barbara McClinton Award <i>Outstanding Graduate Student Award</i> (\$2,000)	2022
United States Department of Agriculture AFRI-NIFA Predoctoral Fellow (PI: Hannah Thomas) <i>Understanding the Role of Intercellular Communication in Vegetable Crop Grafting</i> (\$179,999)	2019-current
Cornell Institute for Digital Agriculture Research Innovation Fund <i>Plant vein detection through machine learning and computer vision</i> (\$9,500)	2018
American Society of Plant Biology (ASPB) <i>Convivon Scholar</i>	2018
Kansas IDeA Network of Biomedical Research Excellence (K-INBRE) <i>The spatial expression of the T cell homing receptor, CCR7 and T cells marker, FoxP3 are differentially regulated by progesterone and estradiol in the rat uterus</i> (\$4,000)	2016

Select Outreach and Enrichment

Education

- Designed original science curriculum implemented by the cities of Ithaca, NY and Freeville, NY school districts during COVID-19 related school closures (2019-2020)
 - Sent plant science kits to 2000 elementary school students
 - Designed and distributed gardening and plant science lessons to hundreds of local families via Ithaca Children's Garden
- Volunteered 15 hours/week as an instructor at the Free Science Workshop. The FSW is a free, open-door workshop for minority and low-income kids in the Ithaca area (2018-2019)
- Worked as an Alliance for Science Instructional Volunteer where I demonstrated and led a DNA extraction lab with a visiting Training Team from Africa and Asia (2018)

- Volunteered with Expanding Your Horizons, all-day science workshop at Cornell University designed to allow young women and girls (K-12) the chance to explore STEAM (2018)

Science Communication

- Coordinated an international science communication workshop in collaboration with Tokyo University of Agriculture and Technology Exchange program in Japan (2017-2018)
- Acted as a freelance writer for Garden Streets; wrote accessible blog posts that conveyed scientific plant information (2020-2021)
- Acts as an Associate Editor for the Journal of Science Policy and Governance (2021-current)

Diversity and Inclusion

- Volunteer for the Cornell Diversity Preview Weekend, designed to promote diversity and inclusion in the incoming graduate program applicants (2018)
- Volunteer with the Urban 4-H Summer camp at Cornell University (2018)
 - Worked with a team of girls from NYC to create a mock-podcast about agriculture.

Science Policy

- Member of the executive board for Advancing Science and Policy at Cornell (2020-current)
- Coordinated the 2022 Virtual Washington D.C. Experience, a 3-part workshop course on writing policy pitches which culminated with pitching the proposed ideas professionals in Washington D.C.
- Attended Science Policy, a course at Cornell University, which taught how to write science policy memos
- Met with congressional staff to advocate for the Research Investment to Spark the Economy Act or RISE Act and continued research funding (2021-current)
- Involved with the Journal of Science Policy and Governance (2021-current)

References

Christine Faulkner, Ph.D. | Group Leader

John Innes Centre

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Margaret Frank, Ph.D. | Assistant Professor of Plant Biology

Cornell University

(607) 255-1734

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Olena Vatamaniuk, Ph.D. | Professor of Crop and Soil Science

Cornell University

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Joyce Van Eck, Ph.D. | Adjunct Professor of Plant Breeding and Genetics, Direction of BTI Transformation Facility

Boyce Thompson Institute

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