

# Jenna M. Hershberger

PLANT BREEDING AND GENETICS PH.D. CANDIDATE · USDA NIFA FELLOW

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## Education

### Cornell University

PH.D. IN PLANT BREEDING AND GENETICS, GPA: 3.79/4.3

- **Minors:** International Agriculture and Rural Development, Field Crop Physiology
- **Advisor:** Michael A. Gore, Ph.D.
- **Thesis:** Quality trait phenotyping and genomics in cassava and sweet corn

*Ithaca, New York*

*July 2016 - Present*

### University of Wisconsin-Madison

B.S. IN HORTICULTURE WITH DISTINCTION, GPA: 3.76/4.0

- **Minor:** African Studies
- **Minnesota Studies in International Development**, Nairobi, Kenya — *Semester Abroad Fall 2014*

*Madison, Wisconsin*

*Sept. 2012 - May 2016*

## Skills

<b>Statistical Genetics</b>	GWAS, TWAS, Genomic Prediction
<b>Phenotyping</b>	Near-infrared spectroscopy, phenotyping smartphone app development
<b>Laboratory</b>	DNA & RNA extraction, gel electrophoresis, tissue culture
<b>Programming</b>	R, Python, reproducible analyses, pipeline development
<b>Languages</b>	English, Spanish (intermediate), Swahili (intermediate)

## Research & Extension

### Cornell University Field of Plant Breeding and Genetics (Gore Lab)

GRADUATE RESEARCH ASSISTANT

- Constructing prediction models for cassava quality traits using handheld NIR spectroscopy
- Developing and integrating spectral analysis tools into BreedBase databases
- Teaching international workshops on the use of smartphone plant phenotyping applications
- Conducting an RNA-seq experiment to study the genetic architecture of nutritional quality traits in fresh sweet corn kernels
- Evaluating genomic and transcriptomic predictive ability for nutritional quality in sweet corn

*Ithaca, NY*

*July 2016 - Present*

### University of Wisconsin-Madison Department of Horticulture/USDA-ARS (Simon Lab)

UNDERGRADUATE STUDENT RESEARCH ASSISTANT

- Planted, weeded, pollinated, and harvested carrot plants
- Assisted faculty, postdoctoral research associates and graduate students with carrot breeding projects
- Trained new student employees
- Extracted DNA, ran PCR and gel electrophoresis
- Performed High Performance Liquid Chromatography
- Initiated and maintained tissue culture, including media preparation

*Madison, WI*

*Nov. 2012 - May 2016*

### Community Rehabilitation and Environmental Protection Programme

FIELD INTERN

- Tended demonstration farm (e.g. plant, compost, harvest, graft, form raised beds)
- Trained local primary school pupils and farmers on Ecological Organic Agriculture
- Wrote and presented reports on field work

*Awasi, Kenya*

*Oct. 2014 - Dec. 2014*

## Grants

2019 **\$121,000**, AFRI Education and Workforce Development Predoctoral Fellowship

*USDA NIFA*

## Awards

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- 2020 **Borlaug Graduate Scholar**, National Association of Plant Breeders  
2012-16 **University of Wisconsin-Madison Dean's List**, All semesters (Fall 2012 - Spring 2016)

## Publications

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### In prep

- **Hershberger JM**, Simoes CC, Ellerbrock B, Morales N, Bauchet GJ, Mueller LA, Gore MA. *In prep*. Making WAVES in BreedBase: an integrated spectral data storage and analysis pipeline for plant breeding programs.
- Shaver B, **Hershberger JM**, Rife TW, Courtney C, Gore MA, Neilsen M. *In prep*. Prospector: a high-throughput NIRS phenotyping application.

### Software

- **Hershberger JM** and Gore MA. (2020). *waves*: Vis-NIR Spectral Analysis Wrapper. R package version 0.1.0. <https://github.com/GoreLab/waves>

## Presentations

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### Invited talks

- **Hershberger JM**, Morales N, Simoes CC, Ellerbrock B, Bauchet GJ, Mueller LA, Gore MA. Making WAVES in Breedbase: an integrated spectral data storage and analysis pipeline for plant breeding programs. Talk presented at the National Association of Plant Breeders Annual Meeting. 2020 August 19, Virtual
- **Hershberger JM**, Ellerbrock B, Mueller LA, Kawuki RS, Oliveira E, Rabbi IY, Gore MA. Development and validation of a low-cost, rapid NIRS-based phenotyping approach for approving cassava root quality traits. Talk presented at the International Plant and Animal Genome XXVIII Conference. 2020 January 11, San Diego, CA
- **Hershberger JM**. Development and integration of handheld NIRS-based phenotyping for cassava breeding. Talk presented at: Kansas State University 4th Biennial Plant Breeding and Genetics Symposium. 2019 April 4, Manhattan, KS

### Conference posters

- **Hershberger JM**, Morales N, Simoes CC, Ellerbrock B, Bauchet GJ, Mueller LA, Gore MA. Making WAVES in Breedbase: an integrated spectral data storage and analysis pipeline for plant breeding programs. Poster presented at the National Association of Plant Breeders Annual Meeting. 2020 August 18, Virtual
- **Hershberger JM**, Baseggio M, Murray M, Magallanes-Lundback M, Kaczmar N, Wood J, Chamness J, Buckler ES, Smith ME, Buell CR, DellaPenna D, Tracy WF, Gore MA. Integrating transcriptomics for the improvement of genetic dissection and prediction of provitamin A and vitamin E in fresh sweet corn kernels. Poster presented at the 62nd Annual Maize Genetics Meeting. 2020 June 25-26, Virtual
- **Hershberger JM**, Ellerbrock B, Mueller LA, Kawuki RS, Oliveira E, Rabbi IY, Gore MA. Development and validation of a low-cost, rapid NIRS-based phenotyping approach for approving cassava root quality traits. Poster presented at the International Plant and Animal Genome XXVIII Conference. 2020 January 10-15, San Diego, CA
- **Hershberger JM**, Ikeogu UN, Esuma W, Kawuki RS, Rabbi IY, Gore MA. Prospector: An Android application for NIRS-based phenotyping of cassava quality traits. Poster presented at the National Association of Plant Breeders 2018 Annual Meeting. 2018 August 7-10, Guelph, ON

### Lectures

- **Hershberger JM**. Breeding for root quality traits in cassava. Lecture given in Cornell University course PLBRG 4030. 2019 December 10, Ithaca, NY
- **Hershberger JM**. Phenotypic prediction with spectral data in R. Lecture and laboratory exercise given in Cornell University course PLBRG 4060; 2019 November 5; Ithaca, NY
- **Hershberger JM**. PhenoApps. Lecture given in Cornell University course PLSCI 4100. 2019 October 17, Ithaca, NY
- **Hershberger JM**. Near-infrared spectroscopy for trait prediction in plants: a cassava case study. Lecture given in Cornell University course PLBIO 4000/6000. 2019 March 28, Ithaca, NY

## Workshops

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|------|---|-------------------------|
| 2019 | <b>Organizer and Participant</b> , Operations Research in Plant Breeding Short Course | Ithaca, NY              |
| 2019 | <b>Organizer and Co-Instructor</b> , NextGen Cassava PhenoApps Workshop               | Kampala, Uganda         |
| 2018 | <b>Organizer and Co-Instructor</b> , NextGen Cassava PhenoApps Workshop               | Dar es Salaam, Tanzania |
| 2017 | <b>Co-Organizer and Participant</b> , Tucson Plant Breeding Institute at Cornell      | Ithaca, NY              |
| 2017 | <b>Participant</b> , Wageningen University Image Analysis for Plant Phenotyping       | Wageningen, Netherlands |
| 2017 | <b>Organizer and Co-Instructor</b> , NextGen Cassava PhenoApps Workshop               | Ibadan, Nigeria         |
| 2016 | <b>Participant</b> , NSF Field-based High Throughput Phenotyping                      | Maricopa, AZ            |

## Service and Membership

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### National Association of Plant Breeders

#### MEMBER

- Attend annual meetings to network and present research
- Attend professional development and research webinars

*United States*

*2017 - Present*

### Synapsis, Cornell Plant Breeding Graduate Student Association

#### MEMBER, CO-PRESIDENT (2016-2017), & HISTORIAN (2017-2018)

- Co-organized graduate student recruitment weekend
- Reported on graduate student business at faculty meetings
- Planned and documented social activities and other events
- Organized overnight graduate student visit to Cornell's Long Island Research Center
- Conducted organization-wide meetings
- Arranged Synapsis departmental seminar and hosted invited speaker

*Ithaca, NY*

*2016 - Present*

### Cornell Graduate Christian Fellowship

#### MEMBER & VICE PRESIDENT (2017-2018)

- Organized weekly Bible study and social activities
- Participated in group discussions on faith and academia
- Maintained organization website

*Ithaca, NY*

*2016 - 2018*

### Blackhawk Church College Age Ministry

#### CORE LEADERSHIP TEAM MEMBER

- Planned organization-wide events
- Co-led small group discussions on faith and college life
- Led musical worship band including music selection, running practice sessions, and coordinating with other leaders
- Participated in two spring break service trips with Second Mile Ministries, a community development non-profit in Jacksonville, Florida

*Madison, WI*

*2013 - 2016*

## Volunteer Experience

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### DOMESTIC

#### Esty Street Food Pantry Garden

##### VOLUNTEER

- Harvested vegetables twice per week
- Delivered produce to Loaves and Fishes, a local, free community meal program

*Ithaca, New York*

*Fall 2017*

#### Madison Area Food Pantry Gardens

##### BOARD MEMBER AND GARDEN LEADER (2015)

- Instructed and led 15+ volunteers on a biweekly basis
- Planned and organized garden layout
- Tended plants (e.g., watered, weeded, harvested)

*Madison, Wisconsin*

*2012 - 2016*

#### Slam Dump, charity basketball tournament to benefit AFE, a Honduran high school and college scholarship program

##### CO-ORGANIZER AND VOLUNTEER

- Organized annual basketball tournament with over 200 participants
- Supervised 30-50 volunteers including recruitment, scheduling, and training
- Managed logistical aspects of the event including sign-in, brackets, and score-keeping
- Requested donations from local businesses for tournament prizes

*Madison, Wisconsin*

*2012 - 2016*

### INTERNATIONAL

#### Beacon of Hope

##### SHORT TERM VOLUNTEER

- Provided support to local doctors and pharmacists by sorting and dispensing medication
- Partnered with local organization to distribute school supplies

*Ongata Rongai, Kenya*

*June 2008, 2013*

## Open Roads

### VOLUNTEER CAMP COUNSELOR

- Partnered with Romanian non-profit to provide summer camp opportunities for local orphans
- Planned and led music and small group discussions for high school students
- Participated in strategic planning to assess organizational resources and community connections

*Craiova, Romania*

*August 2010, 2011, 2012*

## Give Ye Them to Eat, an integrated development program of the Methodist Church

### SHORT TERM VOLUNTEER

- Assisted with repair of local school classrooms and church building
- Taught elementary school students nutritional information through theater skits
- Learned about sustainable development, building practices, and agricultural techniques

*Tlancualpican, Mexico*

*February 2010, 2012*

## Scholarships

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2020	<b>\$440</b> , Graduate School Travel Grant	<i>Cornell University</i>
2017	<b>\$335</b> , Graduate School Travel Grant	<i>Cornell University</i>
2017	<b>\$500</b> , Russell R. Billings Graduate Assistantship	<i>Cornell University</i>
2017	<b>\$1250</b> , Hollingshead Travel Award	<i>Cornell University</i>
2017	<b>\$1000</b> , Travel International Agriculture and Rural Development 602 International Programs Award	<i>Cornell University</i>
2015	<b>\$1250</b> , CALS Wisconsin Agri-Business Association Scholarship	<i>UW-Madison</i>
2015	<b>\$1500</b> , CALS Donald & Nancy Field Natural Resources Scholarship	<i>UW-Madison</i>
2014	<b>\$1500</b> , CALS Donald & Nancy Field Natural Resources Scholarship	<i>UW-Madison</i>
2014	<b>\$1000</b> , African Studies Departmental Scholarship	<i>UW-Madison</i>
2014	<b>\$1000</b> , CALS Gavin & Mary Weis Research Scholarship	<i>UW-Madison</i>
2013	<b>\$1076</b> , CALS Gavin & Mary Weis Research Scholarship	<i>UW-Madison</i>
2013	<b>\$1000</b> , CALS Albert J. & Adelaide E. Riker Academic Merit Award	<i>UW-Madison</i>
2012	<b>\$1500</b> , Ruth & Carl Miller Academic Merit Award	<i>UW-Madison</i>
2012	<b>\$1000</b> , Scholarship for Middleton High School graduate with interest in the plant sciences	<i>Monsanto</i>