SHANTEL A. MARTINEZ

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My career focus is on contributing novel genetic research within agriculture using advanced statistical methods while maintaining direct application towards helping farmers. I believe strongly in being able to communicate science to non-scientists, mentoring young scientists and peers, along with cultivating a collaborative work environment as career priorities.

EDUCATION

Ph.D., 2018: Molecular Plant Science, Washington State University, Pullman WA
M.S., 2013: Crop Science, Washington State University, Pullman WA
B.S., 2011: Bioengineering, Washington State University, Pullman WA

RESEARCH EXPERIENCE

Wheat Molecular Genetics and Prediction Modeling
Post-doctoral | Dr. Mark E. Sorrells Lab 2018 - Mar 2020
Cornell University
APPLICATION: Producing genomic prediction models on large-scale wheat genomic and phenotypic datasets to reduce grain sprouting when certain weather patterns, such as heavy rainfall during harvest time, increase.
RESEARCH: Increasing preharvest sprouting (PHS) tolerance through a genome-wide association study of PHS traits followed by producing genomic prediction models for 1,353 Northeast wheat cultivars and breeding germplasm using 11k genotyping-by-sequencing markers. In tandem, I am fine mapping and characterizing *QPhs.cnl-2B.1* for breeders to directly use for improving preharvest sprouting tolerance.
SKILLS: Computational genetics, comprehensive R and git version control, genomic prediction using ridge and Bayesian regression models, basic python and bash, electronic lab notebook techniques

Improving Germplasm Resources for the PNW
PhD | Dr. Camille M. Steber and Dr. Kimberly Garland Campbell Labs 2013 - 2018
Washington State University
APPLICATION: In 2016, a Low Falling Numbers crisis cost farmers millions of dollars and they needed an immediate solution to ensure their crop would not succumb to this again. My research on preharvest sprouting tolerance (PHS) and Falling Numbers was accelerated to meet these demands. After screening 469 PNW wheat breeding lines, I identified 12 new genetic locations that WSU and USDA wheat breeders immediately used to introgress tolerance into their germplasm. Increased grower knowledge on agronomic best practices were also a result of this project.
RESEARCH: Identified novel loci contributing to wheat PHS tolerance in 469 Northwest germplasm through association mapping of spike-wetting test and falling number traits (Martinez et al., 2018a). Fine mapped an ABA hypersensitive mutant locus that also caused a PHS tolerant phenotype through conducting bulk-segregant exome-capture analysis in a backcross population (*manuscript in preparation*). Produced a drought tolerant mapping population between two Northwest soft white wheat cultivars (Martinez et al., 2018b).
SKILLS: Comprehensive markdown use, large-scale field data collection and coordination, manuscript preparation, applied plant breeding, quality R data visualization and slide design, mutation genetics

Investigating an ABA Hypersensitive Mutant
MS | Dr. Arron H. Carter and Dr. Camille M. Steber Labs 2011 - 2013
Washington State University
APPLICATION: Worked with a molecular geneticist and a wheat breeder to find an applied solution to PHS susceptibility through mutation genetics and field trials. This basic/applied hybrid research experience resulted in learning how to balance an attention-to-detail molecular approach while keeping the large-scale agronomic breeding scope in mind.
RESEARCH: Characterized the ABA hypersensitive mutant, *Zak ERA8* and wild type endogenous hormone levels within the seed, as well as the germination response in the presence and absence of exogenously applied hormones (Martinez et al., 2016). Segregation analysis, preharvest sprouting trials, agronomic and end-use quality traits were compared between wild type and mutant (Martinez et al., 2014).
SKILLS: SAS, research-based statistics, hormone seed biology, lab notebook techniques, crop field practices

COMMUNICATION

INVITED TALKS | TECHNICAL

1. ASA, CSSA, SSSA International Annual Meeting, San Antonio, TX. Nov 2019
   a. Oral: Identifying Loci and Genomic Prediction Models for PHS Tolerance in Northeast Soft Wheat Breeding Programs Nov 11
   b. Workshop: Finding a Common Language for Science | Topic: Data Visualization Nov 12
   c. Poster: Fine-mapping and characterizing the QPhs.cnl-2B.1 found in a Northeast soft white wheat Nov 13
2. Soft Wheat Quality Council Meeting, Raleigh, NC. Identifying Loci and Genomic Prediction Models for PHS Tolerance in Northeast Soft Wheat Breeding Programs 2019
3. Western Wheat Quality Meeting: Falling Numbers Workshop, Portland, OR. The First Step to Tackling the FN Problem: Identifying Tolerant Genes/QTL in PNW Germplasm 2019
4. International Seed Science Society Conference, Monterey, CA. Identification of a Locus Corresponding to the Preharvest Sprouting Tolerance Mutant, ERA8, in Wheat 2017
5. ASA, CSSA, SSSA International Annual Meeting, Phoenix, AZ. Genome-wide Association Mapping of Preharvest Sprouting in PNW White Winter Wheat 2016
6. Plant and Animal Genome Conference, San Diego, CA. Higher Seed Dormancy and ABA Sensitivity Improves Wheat Preharvest Sprouting Tolerance 2016

OUTREACH | NON-TECHNICAL

1. Twitter @s_amealia | Audience: Breeders, **Graduate Students, Data Scientists**
2. Instagram @s_amealia | Audience: **Public, Parents, Family**, Students
3. Small Grains Field Days | Audience: **Farmers, Breeders, Pathologists**
4. MPS Plant Science Day | Audience: Parents and Children K-8
5. Grow NYC Variety Showcase | Audience: Chefs, Public, **Fresh Market Buyers**
6. WSU Extension Wheat Academy Workshop | Audience: **Producers**, Farmers, Commissioners
7. LSAMP End of the Year Banquet Keynote Speaker | Audience: Undergraduates in STEM
8. Future Cougars of Color Plant Science Workshop | Audience: High School **Students**

PROFESSIONAL DEVELOPMENT

Journal Peer Reviewer: Agronomy, Molecular Breeding, Plants, Theoretical and Applied Genetics
SciComm Workshop: training on communicating science to the general audiences 2019
Director of Professional Development 2016-2017
During my PhD, a handful of graduate students and I noticed a need for opportunities to develop professional skills across all disciplines that just weren't being met within graduate programs.

With this crucial need in mind, the Professional Development Initiative (PDI) was created and in one year we implemented 30 new professional development events, served over 1,800 attendees, coordinated and lead 11 graduate student senators, and sat on both the PDI and GPSA Executive Board.
SKILLS: Efficient peer-to-peer communication, interdisciplinary collaboration, conflict resolution, leadership, professionalism, strong organization, built relationships with top-level university leadership

MENTORING

Katherine Roberts, New York HS Science Program Project Award: 1st Place Plant Science 2019
Samantha Beck, CAHNRS Internship Program Project Award: 1st Place Molecular Biology 2017
Dustin Cwuick, LSAMP Internship Program Project Award: 2nd Place Molecular Biology 2016

TEACHING

▪ Methods of Plant Breeding Laboratory (PLBRG 4060), Cornell University. Co-Instructor. Lecture: Fine Mapping and Cloning Gene. Course Purpose: Introduction to breeding methods used by faculty and staff for different species. Class Size: 10-15 students Fa 2019
▪ Teaching Portfolio Institute, Cornell University. Attendee. Topics: defining teaching philosophy, teaching statement, diversity statement, CV, and syllabus design Sp 2019
▪ Effective Teaching Strategies, CIRTL Massive Open Online Courses. Student. Active Learning Through Evidence-Based STEM Teaching Sp 2019
▪ Plant Breeding (CropS 445), Washington State University. Teaching Assistant. Role: grading, substitute lecturer (2x), assist during activities, help students during office hours, and provide exam review sessions. Course Purpose: Understand the genetic principles underlying plant breeding and gain an introduction to the principles and practices of plant breeding. Class Size: 15-25 students Sp 2015

AWARDS & FUNDING

▪ NIFA-AFRI Education and Literacy Initiative Grant 2018-2020
▪ International Seed Science Society Conference Travel Grant 2017
▪ Research Assistantship - AFRI-NIFA Plant Breeding Grant 2016-2017
▪ GPSA Senator Excellence Award 2015-2016
▪ GPSA Research Expo - Agriculture & Natural Science 1st place 2016
▪ Crop and Soil Science Department Travel Grant 2016
▪ Teaching Assistantship for Plant Breeding 2015
▪ Lindahl Memorial Scholarship 2014-2015
▪ ASPB Plant Biology Travel Grant 2014
▪ Distinguished Research Assistantship for Diverse Scholars 2013-2014

DEPARTMENTAL SERVICES

▪ Corteva Plant Science Symposium Committee Role: Host speakers, implementation of symposium 2019
▪ Molecular Plant Sciences (MPS) Annual Recruitment Symposium Presenter Role: Highlighted research in the PhD program to new recruits 2017
▪ GPSA MPS Senator Role: Oversaw $600k budget, maintained updates between PhD program and GPSA 2015-2016
▪ MPS Seminar Committee Role: Invite, host, and coordinate departmental seminar 2013-2014, 2015-2016
▪ WSU-Upward Bound Internship Program Role: Recruiter, volunteer, mentor 2009-2015
▪ LS Alliance for Minority Participation Program Role: Volunteer, mentor 2011-2016

PUBLICATIONS

JOURNAL ARTICLES

1. **Martinez, S.A.**, Godoy J., Huang M., Zhang Z., Carter A.H., Garland Campbell, K.A., and Steber, C.M. (2018a). Genome-Wide Association Mapping for Tolerance to Preharvest Sprouting and Low Falling Numbers in Wheat. Frontiers in Plant Science. 9, 1-16.
2. **Martinez, S.A.**, Thompson A.L., Wen N., Murphy L., Sanquinet K.A., M., Steber, C.M., and Garland Campbell, K. (2018b). Registration of the Louise/Alpowa Wheat Recombinant Inbred Line Mapping Population. Journal of Plant Registrations.
3. **Martinez, S.A.**, Tuttle, K., Takebayashi, Y., Seo, M., Garland Campbell, K., and Steber, C.M. (2016). The Wheat ABA Hypersensitive ERA8 Mutant is Associated with Increased Preharvest Sprouting Tolerance and Altered Hormone Accumulation. Euphytica. 212, 229-245.
4. Tuttle, K.M., **Martinez, S.A.**, Schramm, E.C., Takebayashi, Y., Seo, M., and Steber, C.M. (2015). Grain dormancy loss is associated with changes in ABA and GA sensitivity and hormone accumulation in bread wheat, Triticum aestivum (L.). Seed Science Research 1–15.
5. **Martinez, S.A.**, Schramm, E.C., Harris, T.J., Kidwell, K.K., Garland-Campbell, K., and Steber, C.M. (2014). Registration of Zak Soft White Spring Wheat Germplasm with Enhanced Response to ABA and Increased Seed Dormancy. Journal of Plant Registrations 8, 217-220.

ABSTRACTS | SELECTED

1. **Martinez, S.A.,** Godoy J., Huang M., Zhang Z., Carter A.H., Garland Campbell, K.A., and Steber, C.M. (2019). The First Step to Tackling the FN Problem: Identifying Tolerant Genes/QTL in PNW Germplasm. Falling Numbers Workshop, Jan 30, Portland, OR. *Presentation*
2. **Martinez, S.A.,** Shorinola, O., Conselman, S.R., Skinner D.Z., See, D., Garland Campbell, K., Uauy, C., and Steber, C.M. (2017). Identification of a Locus Corresponding to the Preharvest Sprouting Tolerance Mutant, *ERA8*, in Wheat (*Triticum aestivum* L.). 12th Triennial International Seed Science Society Conference, Sept 14, Monterey, CA. *Presentation*
3. **Martinez, S.A.,** Jernigan, K.L., Parveen, R.S., Garland-Campbell, K., and Steber, C.M. (2016). Genome-wide Association Mapping of Preharvest Sprouting in PNW White Winter Wheat. ASA, CSSA & SSSA International Annual Meeting, Nov 6, Phoenix, AZ. *Presentation
4. **Martinez, S.A.,** Tuttle, K., Seo, M., Garland-Campbell, K., and Steber, C.M. (2016). Higher Seed Dormancy and ABA Sensitivity Improves Wheat Preharvest Sprouting Tolerance. Plant and Animal Genome Conference, Jan 12 San Diego, CA. *Presentation*
5. **Martinez, S.A.,** Tuttle, K., Seo, M., Garland-Campbell, K., and Steber, C.M. (2014). An ABA Hypersensitive Mutants, Zak ERA8, with Increased Seed Dormancy and Preharvest Sprouting Tolerance is Associated with Altered Hormone Content and Sensitivity. ASPB Plant Biology, Portland, OR. *Poster*
6. **Martinez, S.A.,** Tuttle, K., Steber, C.M., and Garland-Campbell, K. (2013). Evaluating Seed Dormancy, Hormone Response, and Pre-Harvest Sprouting Tolerance of an ABA Hypersensitive Mutant Zak ERA8. ASA, CSSA, and SSSA Annual Meeting, Nov 2-5, Tampa, FL. *Presentation*
7. **Martinez, S.,** Schramm, E.C., Garland-Campbell, K., and Steber, C.M. (2012). Evaluating Seed Dormancy and Pre-Harvest Sprouting Resistance of an ABA Hypersensitive Mutant ZakERA0. WSCS Wheat Workers Meeting, July 11-13, Pullman, WA. *Presentation*
8. **Martinez, S.A.,** Garland-Campbell, K., Hulbert, S.H., and Steber, C.M. (2012). Discovering Drought Resistance Mechanisms in Wheat. Dryland Field Day Abstracts, Highlights of Research Progress, June 16, Lind, WA.
9. **Martinez, S.,** Murphy, L., Campbell K., Steber, C., Morris, C., (2010). Determining the Location of Genes Contributing to Supersoft. PNW LSAMP Annual Conference, Seattle, WA. *Poster*