SHANTEL A. MARTINEZ

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Shantel is currently a USDA-NIFA post-doctorate fellow at Cornell University working in the Sorrells lab. She is continuing her research focus of improving wheat preharvest sprouting through genomic selection and QTL mapping. Shantel's career aims are to discover and contribute novel genetic research within the wheat genome using advanced statistical methods.

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 in Preharvest Sprouting
Dr. Mark E. Sorrells Lab
May 2018 - Present | Cornell University
Increasing preharvest sprouting (PHS) tolerance through genome-wide association study of PHS traits followed by producing genomic selection models for Northeast wheat germplasm. In tandem, characterization of a dormant QTL will be done through endogenous seed hormone profiling. The end goal is to fine map the dormant QTL and confirm a candidate dormancy gene(s). Skills in computational genetics, comprehensive markdown and git use, tissue regeneration, and LCMS biochemistry are being obtained.

Improving Germplasm Resources for the PNW
Dr. Camille M. Steber and Dr. Kimberly Garland Campbell Labs
2013 - 2018 | Washington State University
Identify novel loci contributing to PHS and drought tolerance in wheat (*Triticum aestivum* L.) with an emphasis on the role of the plant hormone ABA (abscisic acid) in controlling these processes. This was done by identify loci providing PHS tolerance in northwest germplasm through association mapping of spike-wetting tests and falling number traits (Martinez et al., 2018a). I also mapped an ABA hypersensitive mutant, *ERA8*, locus that also causes a PHS tolerance phenotype through conducting linkage analysis in a RIL population along with bulk segregation analysis to fine map *ERA8* in a backcross population with wild-type (*manuscript in preparation*). And finally, I produced a drought tolerant mapping population between two PNW soft white spring wheat cultivars (Martinez et al., 2018b). Skills in comprehensive R use, large-scale field experiment coordination, manuscript preparation, KASP marker system, and mutation genetics were also acquired.

Investigating an ABA Hypersensitive Mutant
Dr. Camille M. Steber and Dr. Arron H. Carter Labs
2011 - 2013 | Washington State University
During this project I studied the characteristics of an ABA hypersensitive mutant, *Zak ERA8*. Wild-type and mutant endogenous hormone levels within the seed were compared as well as the germination response in the presence and absence of exogenously applied hormones ABA and GA (Martinez et al., 2016). Segregation

analysis, preharvest sprouting trials, agronomic and end-use quality traits were also compared between wild type and mutant (Martinez et al., 2014). Skills were refined in SAS and hormone seed biology.

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

TEACHING

Effective Teaching Strategies, CIRTL Massive Open Online Courses. *Student*. Advanced Learning Through Evidence-Bases STEM Teaching. (Sp 2019)
New York HS Science Program, Cornell University, Ithaca NY. *Mentor*. Fine mapping preharvest sprouting tolerant QTL in wheat on chromosome 2B using the spike-wetting test. WESEF 1st Place. Katherine Robert (Su 2018)
CAHNRS Internship Program, Washington State University, Pullman WA. *Mentor*. Fine mapping a locus corresponding to the Enhanced Response to Abscisic acid, ERA8, gene of wheat (Triticum aestivum L.). SURCA 1st Place. Samantha Beck (Su 2016- Sp 2017)
LSAMP Internship Program, Washington State University, Pullman WA. LSAMP *Mentor*. Exploring wheat seed responses to different hormones and incubation temperatures while identifying cultivars susceptible to PHS. SURCA 2nd Place. Dustin Cwuick (Fa 2015 - Sp 2016)
Plant Breeding (CropS 445), Washington State University, Pullman WA. *Teaching assistant*. Course Purpose: Understand the genetic principles underlying plant breeding and gain an introduction to the principles and practices of plant breeding. (Sp 2015)
Graduate Teaching Workshop, Washington State University, Pullman WA. *Attendee*. Session titles “Leadership in Science Instruction” and “Teaching Large Classes: Challenges and Tips”. (Sp 2014)

PROFESSIONAL DEVELOPMENT

Peer Reviewer Agronomy, Molecular Breeding, Theoretical and Applied Genetics
Future Professors Institute 2018
Theme: Advancing Diversity in Academia. Introduction to understanding what the search committee is looking for, career plans, research plans, publication plans, negotiating a contract, and starting up your first lab.
Director of Professional Development 2016-2017
During my PhD, I also spent a year as the Director of Professional Development for the Graduate and Professional Student Association (GPSA) and developed numerous transferable skills in this position. I implemented 30 new professional development events, served over 1,800 attendees, coordinated and lead 11 GPSA senators, and sat on both the Professional Development Initiative and GPSA Executive Board. This role outside of the laboratory provided me with exceptional soft skills such as communication, collaboration, conflict resolution, leadership, professionalism, and organization.

DEPARTMENTAL SERVICES

- Corteva Plant Breeding Symposium Committee 2019
- Molecular Plant Sciences (MPS) Annual Recruitment Symposium Presenter 2017
- GPSA Director of Professional Development 2016-2017
- GPSA MPS Senator 2015-2016
- Molecular Plant Science GSO Vice President 2014-2015
- Molecular Plant Science Student Seminar Coordinating Committee 2013-2014, 2015-2016
- WSU Upward Bound Internship Program Volunteer and Recruiter 2009-2015

INVITED TALKS

1. Soft Wheat Quality Council Meeting, Raleigh, NC (2019) Identifying Loci and Genomic Prediction Models for PHS Tolerance in Northeast Soft Wheat Breeding Programs
2. Western Wheat Quality Meeting: Falling Numbers Workshop, Portland, OR (2019) The First Step to Tackling the FN Problem: Identifying Tolerant Genes/QTL in PNW Germplasm
3. 12th Triennial International Seed Science Society Conference, Monterey, CA (2017) Identification of a Locus Corresponding to the Preharvest Sprouting Tolerance Mutant, ERA8, in Wheat (Triticum aestivum L.)
4. ASA, CSSA, SSSA International Annual Meeting, Phoenix, AZ (2016) Genome-wide Association Mapping of Preharvest Sprouting in PNW White Winter Wheat
5. Plant and Animal Genome Conference, San Diego, CA (2016) Higher Seed Dormancy and ABA Sensitivity Improves Wheat Preharvest Sprouting Tolerance
6. ASA, CSSA, SSSA International Annual Meeting, Tampa, FL (2013) Evaluating Seed Dormancy, Hormone Response, and Pre-Harvest Sprouting Tolerance of an ABA Hypersensitive Mutant Zak ERA8
7. WSCS Western Regional Wheat Workers Meeting, Pullman, WA (2012) Evaluating Seed Dormancy and Pre-Harvest Sprouting Resistance of an ABA Hypersensitive Mutant ZakERA0

PUBLICATIONS

1. Martinez, S.A., Godoy J., Huang M., Zhang Z., Carter A.H., Garland Campbell, K.A., and Steber, C.M. (2018). 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. (2018). 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.
6. Balla, V.K., Martinez, S., Rogoza, B.T., Livingston, C., Venkateswaran, D., Bose, S., and Bandyopadhyay, A. (2011). Quasi-static Torsional Deformation Behavior of Porous Ti6Al4V alloy. Mater Sci Eng C Mater Biol Appl 31, 945–949.