Shantel A. Martinez

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Shantel is currently a recipient of a USDA-NIFA ELI post-doctorate award and works at Cornell University under Mark E. Sorrells. She is continuing her research focus of improving wheat preharvest sprouting through genomic selection and QTL mapping. Shantel's career aims are to advance and contribute novel genetic research towards the wheat field of study.

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. (Currently Enrolled)
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

Future Professors Institute 2018
The focus of the series I attended was: Advancing Diversity in Academia. Skillsets were introduced which include 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
In addition to my work in the academic field, I’ve also developed numerous skills within my position as Graduate and Professional Student Association (GPSA) Director of Professional Development. In one year, I’ve 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 has 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

CONFERENCE PRESENTATIONS & WORKSHOPS

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. Western Quality Meeting: 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., Beck, S.R., Skinner D.Z., See D., Carter, A.H., Garland-Campbell, K., and Steber, C.M. (2017). Identification of a Locus Corresponding to the Preharvest Sprouting Tolerance Gene ERA8 in Wheat (Triticum aestivum L.). Dryland Field Day Abstracts, Highlights of ***Research Progress***, Jun 15, Lind, WA.
4. 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, Phoenix, AZ. ***Presentation***
5. 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. PAG, Jan 12 San Diego, CA. ***Presentation***
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, SSSA International Annual Meeting, 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 Western Regional Wheat Workers Meeting, Pullman, WA. ***Presentation***
8. Genome-Wide Association Mapping Workshop Attendee 2015
9. Software Carpentry Workshop Attendee 2014

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.