

Tyson R. Howell
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EDUCATION

University of California, Davis, CA. **2010-Summer 2016 (expected)**
Ph.D., Integrative Genetics and Genomics

University of California, Davis, CA. **2005-2009**
B.S., Biotechnology (specializations in plants and microbiology), honors

RESEARCH AND WORK EXPERIENCE

University of California, Davis - Ph.D. **2010-Present**

PI: Dr. Jorge Dubcovsky

Characterization and fine mapping of a drought resistance locus in wheat from a rye chromosome arm translocation

- Conducted replicated field trials with different irrigation regimes
- Implemented and performed high throughput phenotyping on field plots
- Investigated the physiology of genotypes to elucidate mechanism of resistance
- Used high throughput sequencing, with comparative genomic and bioinformatic approaches to characterize the region of interest
- Generated and screened a gamma-irradiated mutant population for fine mapping

University of California, Davis - Jr. Specialist **2009-2010**

PI: Dr. Luca Comai

- Streamlined and automated much of the TILLING by sequencing process
- Performed troubleshooting and optimization at nearly every step of the TILLING by sequencing process, including data analysis

Davis Fire Crew **Summer 2009, 2010**

- Fought wildland forest fires. Dispatched in 16 member crews for 16 day stints

Arcadia Biosciences - Intern **2008-2009**

Supervisors: Cate McGuire, John Goodstal

- Performed high throughput DNA extraction with a Qiagen liquid handling robot
- Worked with and observed tomato, wheat, rice, safflower, soybean and *Arabidopsis* plants in growth chamber, greenhouse and field environments
- Selected and designed several targets for TILLING in tomato, conducted phenotyping of tomato TILLING mutants

University of California, Davis - Student asst. **2007-2009**

Supervisors: Dr. Luca Comai, Dr. Robert Tran, Helen Tsai

- Performed DNA extractions and PCR, assisted in PCR troubleshooting

- Managed and tracked large populations (~10,000 individuals)
- Cared for experimental *Arabidopsis* specimens, general laboratory tasks

SKILLS AND TECHNIQUES

Experimental design and analysis: RCBD, CRD, GLM, Mixed model

High throughput phenotyping: Canopy spectral reflectance (CSR) with several different spectrometers, canopy temperature

Scripting languages: Perl, Python, R, SAS, AWK, bioAWK, bash

HPC cluster: slurm queue manager

Bioinformatics software: bwa, abyss, masurca, CLC, sspace, maker, blast, cdhit, repeat masker, fastqc, quast, kat, bbmap, jellyfish, IGV

Next Generation Sequencing: library preparation, exome capture, read QC and manipulation

Programming and use of different robotic liquid handling systems

AWARDS AND HONORS

- AAAS/Science Program for Excellence in Science **2014-2016**
- Department of Plant Sciences Graduate Student Researcher Award **2012-2016**
- Henry A. Jastro Graduate Research Scholarship Award **2011, 2012, 2013**
- Graduated from the University of California at Davis with honors **2009**

PEER-REVIEWED PUBLICATIONS

Howell T, Hale I, Jankuloski L, Bonafede M, Gilbert M, Dubcovsky J (2014) Mapping a region within the 1RS.1BL translocation in common wheat affecting grain yield and canopy water status. *Theor Appl Genet* 127:2695–2709.

Tsai H, **Howell T**, Nitcher R, Missirian V, Watson B, Ngo KJ, Lieberman M, Fass J, Uauy C, Tran RK, Khan AA, Filkov V, Tai TH, Dubcovsky J, Comai L. (2011) Discovery of rare mutations in populations: TILLING by sequencing. *Plant Physiol* 156:1257–68.

TEACHING

Undergraduate mentoring - Two non-overlapping undergraduates	2011-Present
Teaching Assistant for Jan Dvorak, “Genes and Gene Expression”	Fall 2014
Practice Qualifying Exam Coordinator	Jun-Dec 2013
Teaching Assistant for Mark Sanders, “Genes and Gene Expression”	Summer 2012

PRESENTATIONS

- 2015** *UC Davis Plant Breeding Symposium, Davis, CA, Selected Speaker*
- 2015** *Triticeae Coordinated Agricultural Project. Webinar*
- 2015** *Triticeae Coordinated Agricultural Project annual meeting, San Diego, CA.
Selected speaker*
- 2014** *National Association of Plant Breeders, Minneapolis, MN, Poster*
- 2014** *ACS International Annual Meeting, Long Beach, CA. Invited Speaker*
- 2014** *Plant and Animal Genome Conference, San Diego, CA. Invited Speaker, poster*
- 2014** *Heat and Drought Wheat Improvement Consortium meeting, Frankfurt, Germany.
Poster*
- 2013** *Borlaug summit on Wheat for Food Security, Ciudad Obregon, Mexico. Poster*
- 2013** *Triticeae Coordinated Agricultural Project. Webinar*
- 2013** *Interdisciplinary Graduate and Professional Student symposium, Davis, CA.
Poster*
- 2012** *ACS International Annual Meeting, Cincinnati, OH. Poster*
- 2012** *Triticeae Coordinated Agricultural Project annual meeting, San Diego, CA. Invited
speaker*
- 2011** *Triticeae Coordinated Agricultural Project. Webinar*
- 2011** *Triticeae Coordinated Agricultural Project. Webinar, co-speaker*