Kevin M. Dorn

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EDUCATION

Ph.D. (2015) – University of Minnesota, Plant Biological Sciences
Thesis: Genomics and Domestication of Field Pennycress (*Thlaspi arvense*)

Post-Baccalaureate Certificate (2012) – University of Minnesota
Program: Innovations in Undergraduate Multicultural Teaching and Learning

B.S. (2008) – University of Minnesota
Plant Biology / Genetics, Cell Biology, & Development (double major)

RESEARCH POSITIONS

Postdoctoral Fellow (USDA-NIFA Fellowship), Kansas State University (2015-present)

Graduate Research Fellow (NSF-GRFP Fellowship), University of Minnesota (2012-2015)

Graduate Research Assistant, University of Minnesota (2010-2012)

Undergraduate Research Fellow, Dartmouth College (2007)

Undergraduate Research Assistant, University of Minnesota (2004-2008)

TEACHING POSITIONS

Adjunct Faculty, Minnesota State University, Moorhead (2014)

Graduate Teaching Assistant, University of Minnesota (2011 – 2012)

High School Science Teacher, Teach For America - St. Louis, MO (2008 – 2010)

Undergraduate Teaching Assistant, University of Minnesota (2005-2008)

RESEARCH INTERESTS

- Genomics and molecular genetics of complex plant traits
- Translational and functional genomics to drive marker development and breeding
- Domestication and breeding of new winter annual oilseed and perennial grain crops
- Genome assembly, transcriptomics, epigenomics, high throughput genotyping
- Biology of wheat disease resistance from wild-relative translocations

TEACHING

Courses

Biotechniques: Nucleic Acids and Bioinformatics, MSU BCBT461 (2014)

Applied Biostatistics, UMN BIOL3272/5272 – Teaching Assistant (2012)

Foundations of Biology Lab, UMN BIOL2004 – Teaching Assistant (2011)

ADDITIONAL TRAINING

Exchange Program, Nara Institute of Science and Technology, Japan (2013)

Frontiers and Techniques in the Plant Sciences course, Cold Spring Harbor (2011)

PUBLICATIONS

1.) Horvath, DP; Anderson, JV; Chao, WS; Zheng, P; Buchwaldt, M; Parkin, I; **Dorn,KM**. Genes associated with chloroplasts and hormone-signaling, and transcription factors other than *CBF*s are implicated in differential survival after freezing of *Camelina sativa* biotypes. **Submitted.**

2.) Chopra, R; Johnson, EB; Daniels, E; McGinn, M; **Dorn, KM**; Berroyer, A; Esfahanian, M; Folstad, N; Amundson, K; Betts, K; Frels, K; Anderson, JA; Wyse, DL; Marks, MD. Translational genomics using Arabidopsis as a model enables the characterization of pennycress genes through forward and reverse genetics. **Accepted at The Plant Journal**.

3.) Jaikumar, N; **Dorn, KM**; Snapp, SS. Activity of selected antioxidative enzymes during winter freezing stress varies between younger and older *Thinopyrum intermedium* plants. **Submitted**.

4.) McGinn, M; Phippen, W; Chopra, R; Bansal, S; Jarvis, B; Phippen, M; **Dorn, KM**; Esfahanian, M; Nazarenus, T; Cahoon, E; Durrett, T; Marks, MD; Sedbrook, JC. Molecular tools enabling pennycress (*Thlaspi arvense*) as a model plant and oilseed cash cover crop. **In press**. **Plant Biotechnology Journal**. (DOI: 10.1111/pbi.13014)

5.) Chopra, R; Johnson, EB; Emenecker, R; Cahoon, E; Lyons, J; Kleibenstein, DJ; Daniels, E; **Dorn, KM**; Esfahanian, M; Folstad, N; Frels, K; McGinn, M; Ott, M; Gallaher, C; Ismail, B; Anderson, JA; Wyse, DL; Umaslov, T; Sedbrook, JC; Marks, MD. Toward the creation of a new ecofriendly cash cover crop with canola-like qualities. **Submitted**.

6.) **Dorn, KM**; Johnson, EB; Daniels, E; Marks, MD. Spring flowering habit in field pennycress (*Thlaspi arvense*) has arisen multiple independent times. Preprint (DOI: 10.1101/174920). **Accepted at Plant Direct.**

7.) Anderson, JV; Horvath, DP; Dogramaci, M; **Dorn, KM**; Chao, WS; Watkin, E; Hernandez, AG; Marks, MD; Gesch, R. (2018) Expression of Flowering Locus C and a frame shift mutation of this gene on Chromosome 20 differentiate a summer- and winter-annual biotype of Camelina sativa. **Plant Direct**. DOI: 10.1002/pld3.60

8.) Ryder, NA; **Dorn, KM**; Huitsing, M; Adams, M; Ploegstra, J; DeHaan, L; Larson, S; Tintle, NL. (2018) Transcriptome assembly and annotation of johnsongrass (Sorghum halepense) rhizomes identifies candidate rhizome-specific genes. Preprint available on BioRxiv (DOI: 10.1101/243956). **Plant Direct**.

9.) Horvath DP, Patel S, Doğramaci M, Chao WS, Anderson JV, Foley ME, Scheffler B, Lazo G, **Dorn K**, Yan C, Childers A, Schatz M, Marcus S (2018) Gene Space and Transcriptome Assemblies of Leafy Spurge (*Euphorbia esula*) Identify Promoter Sequences, Repetitive Elements, High-Quality Markers, and a Full-Length Chloroplast Genome. **Weed Science** 66:355–367. doi: 10.1017/wsc.2018.2

10.) N. Jordan*, **K.M. Dorn*,** T.M. Smith, K.E. Wolf, P.M. Ewing, A.L. Fernandez, B.C. Runck, A. Williams, Y. Lu, J. Kuzma. A Cooperative Governance Network for Crop Genome Editing. (2017) **EMBO Reports**. ***These authors contributed equally to this work.** DOI: 10.15252/embr.201744394

11.) Thomas, JB; Hampton, ME; **Dorn, KM**; Marks, MD; Carter, CJ. The pennycress (*Thlaspi arvense* L.) nectary: Structural and transcriptomic analyses**. BMC Plant Biology**.

12.) DeHaan, LR; Van Tassel DL; Anderson, JA; Asselin, SR; Barnes, R; Baute, GJ; Cattani, DJ; Culman, S; **Dorn, KM**; Hulke, BS; Kantar, M; Larson, S; Marks, MD; Miller, AJ; Poland, J; Ravetta, DA; Rude, E; Ryan, MR; Wyse, DL; Zhang, X. A Pipeline Strategy for Crop Domestication. (2016) **Crop Science**. doi: 10.2135/cropsci2015.06.0356

13.) Kantar, M*; Tyl, C*; **Dorn, KM***; Zhang, X*; Jungers, J*; Kaser, J*; Schendel, R*; Runck, B*; Eckberg, J*; Bunzel, M; Jordan, N; Stupar, R; Marks, MD; Anderson, J; Johnson, G; Scheaffer, C; Schoenfuss, T; Ismal, B; Wyse, DL. Perennial Grain and Oilseed Crops. (2016) **Annual Review of Plant Biology**. DOI: 10.1146/annurev-arplant-043015-112311 ***These authors contributed equally to this work**

14.) Jordan, NR; **Dorn, KM**; Runck, B; Ewing, P; Williams, A; Anderson, KA; Felice, L; Haralson, K; Goplen, J; Altendorf, K; Fernandez, A; Phippen, W; Sedbrook, J; Marks, MD; Wolf, KE; Wyse, DL; Johnson, G. Sustainable commercialization of new crops for the agricultural bioeconomy. (2016) **Elementa**. DOI: 10.12952/journal.elementa.000081

15.) **Dorn, KM**; Fankhauser, JD; Wyse, DL; Marks, MD. A draft genome of field pennycress (*Thlaspi arvense*) provides tools for the domestication of a new winter biofuel crop. (2015) **DNA Research**. Volume 22, Issue 2. p.121-131. DOI: 10.1093/dnares/dsu045

16.) **Dorn, KM**; Fankhauser, JD; Wyse, DL; Marks, MD. De novo assembly of the pennycress (*Thlaspi arvense*) transcriptome provides tools for the development of a winter cover crop and biodiesel feedstock. (2013) **The Plant Journal**. Volume 75. Issue 6, p.1028 – 1038.

MANUSCRIPTS PENDING SUBMISSION (AVAILABLE FOR REVIEW)

Larson, S; DeHaan, L; Poland, J; Zhang, X; **Dorn, KM**; Crain, J; Kantarski, T; Robbins, M; Jensen, K. Genome mapping of quantitative trait loci (QTL) controlling domestication traits of intermediate wheatgrass (*Thinopyrum intermedium*)

Gao, L; Koo, DH; Juliana, P; Rife, T; Singh, D; Lemes, C; Lux, T; **Dorn, KM**; Clinesmith, M; Silva. P; Wang, X; Spannagl, M; Monat, C; Friebe, B; Steuernagel, B; Muehlbauer, G; Pozniak, C; Singh, R; Stein, N; Mascher, M; Fritz, A; Poland, J. Characterization of a 33Mb *Aegilops ventricosa* Translocation Segment Widely Present in Bread Wheat Germplasm and its Impact on Wheat Breeding.

ONGOING PROJECTS WITH ANTICIPATED PUBLICATIONS

- Whole genome sequencing approaches provide new insights into the subgenome evolution of the allohexaploid *Thinopyrum intermedium*
- Automated genotyping of alien translocations in wheat breeding programs
- Genomic characterization of *Thinopyrum intermedium* translocations containing the Wheat Streak Mosaic Virus resistance gene WSM1 in bread wheat (*Triticum aestivum)*

- Signatures of neo-domestication in the *Thinopyrum intermedium* genome
- The genomes of perennial hybrid wheat and *Thinopyrum elongatum* provide insights into the genomic landscape of perenniality in the Triticeae
- Characterization and cellular roles of a novel O-GlcNAc Transferase in *Synechococcus elongatus*
- Genetic characterization of a novel methyltransferase in *Arabidopsis thaliana*.
- The role of the DELLA protein PROCERA in tomato ABA response networks

GRANT FUNDING

Awarded ~$700,000 in competitive grant and fellowship funding from NSF, USDA-NIFA, the Forever Green Agricultural Initiative, and the University of Minnesota

A Horticultural and Genetic Characterization of Oak Leaf Hydrangea (*Hydrangea quercifolia* Bartrm.) Collected Across Its Range of Occurrence | USDA Crop Production and Protection | PI: L. Alexander, CoPI: Dorn | $23,000. 2018

Enhancing field testing and genomic tools for pennycress breeding and domestication | Minnesota Department of Agriculture | PI: J. Anderson, **CoPI: Dorn** | $199,817 | 2018-2020

Allelic diversity of kernel hardness in intermediate wheatgrass and associated variation in the protein profile | Forever Green Agricultural Initiative | PI: J. Anderson, **CoPI: Dorn** | $63,700 | 2017 - 2019

Exploring the genomic landscape of perenniality within the Triticeae (Postdoctoral Fellowship) USDA-NIFA | **PI: Dorn**, CoPI: J. Poland | $151,660 | 2017 – 2019

Developing robust identification assays for Ameranthus palmeri in seed mixtures MN Invasive Terrestrial Plants and Pest Center | PI: D. Wyse, **CoPI: Dorn** | $210,000 | 2017

The Intermediate Wheatgrass Genome: A resource for understanding mechanisms of perenniality and accelerating the development of perennial crops DOE-Joint Genome Institute | PI: J. Poland, **CoPI: Dorn** | >10 Tb of DNA Sequencing | 2016

Genomics and Domestication of Field Pennycress (*Thlaspi arvense*) *(Graduate Fellowship)* NSF-GRFP | **PI: Dorn**, CoPI: M.D. Marks | $130,000 | 2012 - 2015

Characterizing and manipulating microRNA-mediated development in Camelina UMN Graduate School Anderson Fellowship | **PI: Dorn**, CoPI: M.D. Marks | $2996 | 2012

Characterization and manipulation of architecture in Brassicaceae crops Sigma Xi | **PI: Dorn**, CoPI: M.D. Marks | $800 | 2011

Testing the effects of natural variation in circadian rhythm on plant competitive ability UMN-UROP | **PI: Dorn**, CoPI: C. Weinig | $1700 | 2007

Effects of competition and circadian rhythm on fitness in Arabidopsis UMN-UROP | **PI: Dorn**, CoPI: C. Weinig | $1700 | 2006

PATENT APPLICATIONS

Marks, MD; Sedbrook, JC; Wyse, DL; **Dorn, KM**. Plants having increased oil capacity. Provisional application filed with US Patent and Trademark Office 01/27/2017

HONORS, AWARDS, FELLOWSHIPS

Postdoctoral Fellowship
United States Department of Agriculture National Institute of Food and Agriculture, 2017-2019

Phillip C. Hamm Memorial Scholarship in the Plant Sciences
University of Minnesota, 2014

Graduate Research Award
Sigma Xi, 2014

'20 under 30' Alumni Award
University of Minnesota College of Biological Sciences, 2014

'CEHD 23 – Rising Alumni' Award
University of Minnesota College of Education and Human Development, 2013

NSF Graduate Research Fellowship
National Science Foundation - Graduate Research Fellowship Program, 2012

Monsanto Multifunctional Agriculture and Food System Fellowship
University of Minnesota, 2012 (declined in lieu of NSF GRFP)

Outstanding Performance Award for Teaching Assistants
University of Minnesota College of Biological Sciences, 2012

Honorable Mention – Ford Foundation Pre-doctoral Fellowship
Ford Foundation & The National Academies, 2012

Top 10 National Finalist for Graduate Sustainability Fellowship
The ERM Foundation, 2011

Norman Kerr Memorial Scholarship
University of Minnesota College of Biological Sciences, 2007

INVITED PRESENTATIONS

19 invited presentations (all as presenting author) including Plant and Animal Genome, Plant Biology, International Conference on Arabidopsis Research, Weed Science Society of America, Pan-American Congress on Plants and Bioenergy, and the International Triticeae Symposium.

Genomics driven domestication of next generation crops. University of Minnesota Applied Plant Sciences Seminar Series | St. Paul, MN | October 2018

Accelerating the domestication and improvement of the perennial grain crop Thinopyrum intermedium with genomics. Plant and Animal Genome | San Diego, California | Jan 2018

Genomics-guided development of perennial grain crops. University of St. Thomas Department of Biology | St. Paul, MN | Dec 2017

The genome of the perennial grain crop Thinopyrum intermedium unravels the evolutionary history of the genus. 8th International Triticeae Symposium | Wernigerode, Germany | June 2017

The Intermediate Wheatgrass Genome: A Resource for Understanding Mechanisms of Perenniality and Accelerating the Development of Perennial Crops. Plant and Animal Genome | San Diego, California | Jan 2017

Developing a Genomic Toolbox for the Improvement of Intermediate Wheatgrass as a Perennial Grain Crop. Plant and Animal Genome | San Diego, California | Jan 2017

Genomics-driven domestication of pennycress as a new winter oilseed crop. Dordt College | Sioux Center, Iowa | Oct 2015

Genomics and domestication of field pennycress (Thlaspi arvense). New Phytologist – Next Generation Scientists Conference | Norwich, England | July 2014

Genomics and domestication of the winter biofuel crop field pennycress (Thlaspi arvense L.). Plant Biology 2014 (American Society of Plant Biologists) | Portland, Oregon | July 2014

Genomics and domestication of the winter biofuel crop field pennycress (Thlaspi arvense L.). 4th Pan-American Congress on Plants and Bioenergy | Guelph, Canada | June 2014

Genomics-enabled domestication of the winter biofuel crop field pennycress (Thlaspi arvense). University of Minnesota Natural Resources Association of Graduate Students Annual Symposium. | St. Paul, MN | Apr 2014

Genomics and domestication of field pennycress (Thlaspi arvense). Weed Science Society of America Annual Meeting | Vancouver, Canada | Jan 2014

Genomics and Domestication of the Winter Oilseed Species Field Pennycress (Thlaspi arvense) Nara Institute of Science and Technology, Dept. Plant Biology Seminar | Ikoma, Japan | Nov 2013

Sustainable agriculture in the genomics era. Minnesota Department of Agriculture Clean Water Seminar Series | St. Paul, Minnesota | Aug 2013

The use of Arabidopsis as a resource to improve field pennycress, a next generation biodiesel feedstock. | International Conference on Arabidopsis Research | Sydney, Australia | June 2013

Developing genomic resources to improve Pennycress as a winter cover crop and biofuel feedstock. University of Minnesota Plant Biological Sciences Annual Retreat | St. Paul, MN | May 2013

Genomic characterization of the oilseed crop field pennycress. University of Minnesota Applied Plant Sciences Seminar Series | St. Paul, MN | May 2013

Genomic characterization of pennycress, a new species for sustainable biofuel production University of Minnesota Plant Biological Sciences Student Seminar Series | St. Paul, MN | 10/2012

Circadian rhythm affects plant competitive ability. National Conference on Undergraduate Research | San Rafael, California | May 2007

POSTER PRESENTATIONS

15 poster presentations (all as presenting author) including Plant and Animal Genome, Plant Biology, International Conference on Arabidopsis Research, Crop Science Society of America, and The Joint Genome Institute User Meeting

The genome of the perennial grain crop Thinopyrum intermedium provides tools for breeding and unravels the evolutionary history of the genus. Joint Genome Institute User Meeting | Walnut Creek, California | 2017

The Intermediate Wheatgrass Genome: a Resource for Understanding Mechanisms of Perenniality and Accelerating the Development of Perennial Crops. Joint Genome Institute User Meeting | Walnut Creek, California | 2016

Genome and Transcriptome Sequencing of Intermediate Wheatgrass (Thinopyrum intermedium) Provides Resources for the Development of a New Perennial Grain Crop. Crop Science Society of America Annual Meeting | Minneapolis, Minnesota | 2015

Genomics-based improvement of the winter biofuel crop field pennycress (Thlaspi arvense). Plant and Animal Genome | San Diego, California | 2014

De novo assembly of the pennycress (Thlaspi arvense) transcriptome provides new tools for the development of a winter cover crop and biodiesel feedstock. University of Minnesota Plant Biological Sciences Annual Retreat | St. Paul, MN | 2013

Genomics and Domestication of the Winter Oilseed Species Field Pennycress (Thlaspi arvense). Nara Institute of Science and Technology International Student Workshop | Ikoma, Japan | 2013

Transcriptome comparison of glandular and non-glandular trichomes of Medicago truncatula. Plant Biology 2012 (American Society of Plant Biologists) | Austin, TX | 2012

From Arabidopsis to Camelina: Translating our knowledge of trichome development. Plant Biology 2011 (American Society of Plant Biologists) | Minneapolis, MN | 2011

Maximizing the yield potential of Camelina sativa for a sustainable biodiesel feedstock. University of Minnesota Microbial and Plant Genomics Symposium | St. Paul, MN | 2011

On the Brinc of Discovery: Characterization of a novel stomach cancer gene. Washington University – St Louis Young Scientist Program/Teacher Researcher Partnership Symposium | St. Louis, MO | 2009

Overexpression of Arabidopsis circadian proteins for the production of antibodies. Leadership Alliance Symposium | Stamford, CN | 2007

Overexpression of Arabidopsis circadian proteins for the production of antibodies. Dartmouth College Summer Undergraduate Research Fellow Symposium | Hanover, NH | 2007

Circadian rhythm affects plant competitive ability. University of Minnesota Undergraduate Research Symposium | Minneapolis, MN | 2007

Testing the causal effects of circadian rhythm on plant competitive ability. University of Minnesota Undergraduate Research Symposium | Minneapolis, MN | 2006

Environmental influence on differentiation in leaf epidermal cells. University of Minnesota Undergraduate Research Symposium | Minneapolis, MN | 2005

TRAVEL GRANTS

Over $8,000 in awarded travel grants to attend conferences, including grants from the American Society of Plant Biologists, Society for Experimental Biology, North American Arabidopsis Steering Committee, and the UMN Microbial and Plant Genomics Institute

PROFESSIONAL SOCIETIES

American Society of Plant Biologists, Crop Science Society of America, Sigma Xi-The Scientific Research Society (elected 2007), The Society for Experimental Biology

PEER REVIEWER

BMC Plant Biology, *PLOS ONE*, *Genomics, The Plant Genome, Crop Science, Journal of Agricultural and Applied Economics, Journal of Applied Genetics*