

## Brian Dilkes

Professor

Department of Biochemistry

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### EDUCATION

- 2003 Ph. D., University of Arizona, Department of Plant Sciences  
1993 B. L. A., Oberlin College, Biology

### POSITIONS HELD

- 2019- Professor, Department of Biochemistry, Purdue University  
2016- Member, Center for Plant Biology, Purdue University  
2015-2019 Associate Professor, Department of Biochemistry, Purdue University  
2015-2017 Chair, Integrative Plant Science training group, Purdue Interdisciplinary Life Science Graduate Group  
2010-2013 Chair, Molecular Evolutionary Genetics training group, Purdue Interdisciplinary Life Science Graduate Group  
2009-2015 Assistant Professor, Department of Horticulture and Landscape Architecture, Purdue University  
2006-2008 Project Scientist, Genome Center, University of California, Davis  
2003-2005 USDA Postdoctoral Fellow, Biology Dept., University of Washington

### PUBLICATIONS

\* corresponding author, <sup>1</sup> first author, Dilkes lab members in **bold**

Thompson/ISI (8/06/2019): **2317 citations**; h index=**23**

<http://www.researcherid.com/rid/C-9293-2012>

Google Scholar (8/06/2019): **3504 citations**; h index=**28**, i10=**39**

<http://scholar.google.com/citations?user=Rkx4gSoAAAAJ>

Impactstory media and non-peer reviewed impact summary

<https://impactstory.org/u/0000-0003-2799-954X/achievements>

### **Refereed Journal Publications (57 total, 14 corresponding authorships)**

In **bold** are Dilkes lab members.

\* are corresponded by Dr. Dilkes (when co-corresponding this is indicated)

<sup>1</sup> are co-first authors

<sup>u</sup> are undergraduates

1. Fikas, AA, **Dilkes BP**, Baxter, I 2019 Multivariate analysis reveals environmental and genetic determinants of element covariation in the maize grain ionome. *Plant Direct* 3:1–15. <https://doi.org/10.1002/pld3.139>
2. **Khangura RS**, Marla S, Venkata BP, Heller NJ, Johal GS, and **Dilkes BP\*** 2019 A *Very Oil Yellow1* modifier of the *Oil Yellow1-N1989* allele uncovers a cryptic phenotypic impact of cis-regulatory variation in maize. *G3* 9:375-390
3. Marla SR, Chu K, Chintamanani S, Multani D, Klempien A, DeLeon A, Bong-suk, Dunkle LD, **Dilkes BP**, Johal GS 2018 Adult plant resistance in maize to northern leaf spot is a feature of partial loss-of-function alleles of *Hm1*. *Plos Pathogens* 14 (10): e1007356
4. Schaefer RJ, Michno J, Jeffers J, Hoekenga O, **Dilkes BP**, Baxter B, Myers CL 2018 Integrating co-expression networks with GWAS to prioritize causal genes in maize. *Plant Cell* 30 (12), 2922-2942
5. Sindhu A, Janick-Buckner D, Bukner B, Gray J, Zehr U, **Dilkes BP\***, Johal GS\* 2018 Propagation of cell death in *dropdead1*, a sorghum ortholog of the maize *lls1* mutant. *PlosOne* 13 (9): e0201359
6. Yin J, Gosney M, **Dilkes BP\***, Mickelbart M\*. 2018 Transcriptomic and metabolic profiling of two *Eutrema salsugineum* accessions. *Plant Direct* 2 (2), e00032
7. Yang J, Thames S, **Best NB**, Jiang H, Huang P, **Dilkes BP**, Eveland AL. 2018 Brassinosteroids modulate meristem fate and differentiation of unique inflorescence morphology in *Setaria viridis*. *The Plant Cell* 30(1): 48–66
8. Dolan W, **Dilkes B**, Stout J, Bonawitz N, and Chapple C. 2018 Mediator Complex Subunits MED2, MED5, MED16, and MED23 genetically interact in the regulation of phenylpropanoid biosynthesis. *The Plant Cell*. 29 (12): 3269-3285
9. **Addo-Quaye C**, M Tuinstra, N Carraro, C Weil, **BP Dilkes\***. 2018 Whole Genome Sequence Accuracy Is Improved by Replication in a Population of Mutagenized Sorghum. *G3: Genes, Genomes, Genetics*, g3. 300301.2017
10. Thapa R, Carrero-Colón M, **Addo-Quaye C**, Held J, **Dilkes B**, Hudson KA. 2018 New alleles of FAD3A confer reduced linolenic acid trait to soybean seeds. *Crop Science* 58 (2), 713-718
11. **Best NB**, Johal G, **Dilkes BP\***. 2017 Phytohormone inhibitor treatments phenocopy brassinosteroid–gibberellin dwarf mutant interactions in maize. *Plant Direct*. 1(2):1–18. <https://doi.org/10.1002/pld3.9>
12. Duan C-G, Wang X, Xie S, Pan L, Miki D, Tang K, Hsu C-C, Lei M, Zhong Y, Hou Y-J, Wang Z, Zhang Z, Mangrauthia SK, Xu H, Zhang H, **Dilkes B**, Tao AW, Zhu J-K. 2017 A pair of transposon-derived proteins function in a histone acetyltransferase complex for active DNA demethylation. *Cell research* 27(2): 226-240

13. **Addo-Quaye C<sup>1</sup>, Buescher E<sup>1</sup>, Chaikam V**, Baxter I and **Dilkes B\***. 2017 Gene identification using high throughput sequencing and EMS variation induced inbred lines. *G3 – Genes Genome Genetics* 7(2):413-425 doi: 10.1534/g3.116.029.660
14. Asaro A, G Ziegler, C Ziyomo, O Hoekenga, **B Dilkes** and I Baxter. 2016 The Interaction of Genotype and Environment Determines Variation in the Maize Kernel Ionome. *G3 – Genes Genome Genetics* 6(12):4175-4183 doi: 10.1534/g3.116.034827
15. Huang XY, Chao DY, Koprivova A, Danku J, Wirtz M, Mller S, Sandoval FJ, Bauwe, H, Roje S, **Dilkes B**, Rudiger H, Kopriva S, and Salt DE. 2016 Nuclear localised MORE SULPHUR ACCUMULATION1 epigenetically regulates sulphur homeostasis in *Arabidopsis thaliana*. *PLOS Genetics* 12 (9), e1006298
16. Chettoor AM, Phillips AR, Coker CT, **Dilkes B**, and Evans MMS. 2016 Maternal gametophyte effects on seed development in maize. *Genetics* 204(1): 233-248
17. **Best NB**, Hartwig T, Budka J, Fujioka S, Johal G, Schulz B, **Dilkes BP\***. 2016 Brassinosteroids and Gibberellic acids are mutually dependent in the control of maize development. *Plant Physiology* 171(4): 2633-2647
18. **Best NB\***, Wang X, Brittsan S<sup>u</sup>, Dean E<sup>u</sup>, Helpers SJ<sup>u</sup>, Homburg R<sup>u</sup>, Mobley ML<sup>u</sup>, Spindler TL<sup>u</sup>, Xie B<sup>u</sup>, Hasegawa PM, Joly RJ, Rhodes D, **Dilkes BP\***. 2016 *Helianthus annuus* 'Sunspot' is hyposensitive to GA3 and has a missense mutation in the DELLA motif of *HaDELLA1*. *Journal of the American Society for Horticultural Science* 141: 389-384
19. M Massafaro, A Thompson, M Tuinstra, **B Dilkes**, CF Weil. 2016 Mapping the Increased Protein Digestibility Trait in the High-Lysine Sorghum Mutant P721Q. *Crop Science* 56 (5), 2647-2651
20. **Silva M, Addo-Quaye C**, and **Dilkes BP\***. 2016 Reassessment of reportedly metal tolerant *Arabidopsis thaliana*. *PLoS One* 11(7): e0130679
21. Carter C, Henderson J, **Svedin E**, Fiers M, McCarthy K, Smith A, Guo C, Bishop B, Zhang H, Riksen T, Shockley A, **Dilkes BP**, Boutilier K, and Ogas J. 2016 CHD3 Crosstalk between sporophyte and gametophyte generations is promoted by CHD3 Chromatin Remodelers in *A. thaliana*. *Genetics* 203: 817-829
22. Shakoor N, Ziegler G, **Dilkes BP**, Brenton Z, Boyles R, Connolly EL, Kresovich S, and Baxter IR. 2016 Integration of experiments across diverse environments identifies the genetic determinants of variation in *Sorghum bicolor* seed element composition. *Plant Physiology* 170: 1989-1998
23. Strauch RC, **Svedin E, Dilkes B**, Chapple C, Li X. 2015 Discovery of a novel amino acid racemase through exploration of natural variation in *Arabidopsis thaliana* *Proceedings of the National Academy of Sciences U. S. A.* 112: 11726-11731
24. Chao D-Y, Baraniecka P, Danku J, Koprivova A, **Lahner B**, Luo H, Yakubova E, **Dilkes B**, Kopriva S, Salt DE 2014 Variation in sulfur and selenium accumulation is controlled by naturally occurring isoforms of the key sulfur assimilation enzyme APR2 across the

*Arabidopsis thaliana* species range. Plant Physiology 166(3):1593-1608

25. Maharjan P, **Dilkes BP**, Shozo, F, Pencik A, Ljung K, Burow M, Halkier, B and Choe S. 2014 *Arabidopsis gulliver1/superroot2-7* identifies a metabolic basis for auxin and brassinosteroid synergy The Plant Journal 80:797-808
26. **Buescher E**, Moon JH, Hake S and **Dilkes BP\*** 2014 Identification of novel genes regulating meristem maintenance and leaf angle in maize as epistatic *Liguleless-narrow* suppressors. G3, 114.014183
27. Li X, Huaping M, **Svedin E**, Atwell S, and **Dilkes BP\***, Chapple C\* 2014 Exploiting natural variation of Secondary Metabolism Identifies a Gene Controlling the Glycosylation Diversity of Dihydroxybenzoic Acids in *Arabidopsis thaliana*. Genetics 198:1267-1276
28. Henry IM, **BP Dilkes** and A Tyagi, B Christensen and L Comai 2014 The BOY NAMED SUE Quantitative Trait Locus Confers Increased Meiotic Stability to an Adapted Natural Allopolyploid of *Arabidopsis*. The Plant Cell 26:181-194
29. **Cheon JN**, Fujioka S, **Dilkes BP\***, Choe S\* 2013 Brassinosteroids regulate plant growth through distinct signaling pathways in *Selaginella* and *Arabidopsis*. Plos One 8(12) e81938
30. Chao D, **Dilkes B**, Luo H, Douglas A, Yakubova E, **Lahner B** and Salt DE 2013 Polyploids exhibit higher potassium uptake and salinity tolerance in *Arabidopsis*. Science 341(6146): 658-659
31. Krothapalli K<sup>1</sup>, **Buescher E<sup>1</sup>**, Li X, Brown D, Chapple C, **Dilkes BP\*** and Tuinstra M\* 2013 *Dhurrinase2* is required for cyanide release from *Sorghum bicolor*. Genetics 195:309-318
32. Burkart Waco D, Josefsson C, **Dilkes BP** and Comai L 2013 Early disruption of maternal-zygotic interaction and activation of defense responses in *Arabidopsis* interspecific incompatibility. Plant Cell 25(6):2037-55. doi: 10.1105/tpc.112.108258
33. Hollister JD, Arnold BJ, **Svedin E**, Xue KS, **Dilkes BP**, Bomblies K 2012 Genetic Adaptation Associated with Genome-Doubling in Autotetraploid *Arabidopsis arenosa*. PLoS Genet 8(12): e1003093. doi:10.1371/journal.pgen.1003093
34. Albertin CB, Bonnaud L, *et al.*, 2012 Cephalopod Genomics: A plan of strategies and organization. Standards in Genomic Sciences 7(1)
35. I Baxter\* and **Dilkes BP\*** 2012 Elemental profiles reflect plant adaptations to the environment. Science 336 (6089): 1661-1663
36. Burkart-Waco D, Josefsson C, **Dilkes BP**, Kozloff N, Torjek O, Meyer R, Altmann T and Comai L 2012 Hybrid incompatibility in *Arabidopsis* is determined by a multi-locus genetic network. Plant Physiology 158(2): 801-812
37. Correa R, Stanga J, Larget B, Roznowski A, Shu G, **Dilkes BP** and Baum DA 2012 An assessment of transgenomics as a tool for identifying genes involved in the evolutionary differentiation of closely related plant species. New Phytologist 193(2): 494-503

38. Chang PL, **Dilkes BP**, McMahon M, Comai L and Nuzhdin SV 2010 Homoeolog-specific retention and use in allotetraploid *Arabidopsis suecica* depends on parent of origin and network partners. *Genome Biology* 2010, 11: R125
39. Henry IM, **Dilkes BP**, Miller ES, Burkart-Waco D and Comai L 2010 Phenotypic consequences of aneuploidy in *Arabidopsis thaliana*. *Genetics*. 186(4): 1231-1245
40. Pignatta D, **Dilkes BP**, Yoo, SY, Henry IM Madlung, A, Doerge, RW, Chen, JZ and Comai L 2010 Differential sensitivity of the *Arabidopsis thaliana* transcriptome and enhancers to the effects of genome doubling. *New Phytologist* 186(1):194-206
41. Henry IM, **Dilkes BP**, Tyagi A, Lin H-S and Comai L 2009 Dosage and parent-of-origin effects shaping aneuploid swarms in *A. thaliana*. *Heredity* 103(6): 458-468
42. Walia H, Josefsson C. **Dilkes BP**, Kirkbride R, Harada J and Comai L 2009 Dosage-dependent deregulation of an AGAMOUS LIKE GENES cluster contributes to interspecific incompatibility. *Current Biology* 19(13): 1128-1132
43. **Dilkes BP**, Spielman M, Wiezbauer R, Burkart-Waco D, Watson B, Scott R and Comai L 2008 The maternally-expressed WRKY transcription factor TTG2 controls lethality in interploidy crosses of *Arabidopsis*. *PLoS Biol* 6(12): e308
44. Pignatta D, **Dilkes BP**, Wroblewski T, Michelmore RW and Comai L 2008 Transgene-induced gene silencing is not affected by a change in ploidy level. *PLoS ONE* 3(8): e3061
45. Henry IM, **Dilkes BP** and Comai L 2007 Genetic basis for dosage sensitivity in *Arabidopsis thaliana*. *PLoS Genet* 3(4): e70
46. Henry IM, **Dilkes BP** and Comai L 2006 Molecular karyotyping and aneuploidy detection in *A. thaliana* using quantitative fluorescent PCR. *Plant Journal*, 48: 307-319
47. Josefsson C, **Dilkes B** and Comai L 2006 Parent-dependent loss of gene silencing during interspecies hybridization. *Current Biology* 16: 1322-1328  
*Featured by Faculty of 1000.*
48. Coelho CM, Dante RA, Sabelli PA, Sun Y, **Dilkes BP**, Gordon-Kamm WJ and Larkins BA 2005 Cyclin-dependent kinase inhibitors in maize endosperm and their potential role in endoreduplication. *Plant Physiology* 138: 2323-2336
49. Henry IM, **Dilkes BP**, Young K, Watson B, Wu H and Comai L 2005 Aneuploidy and genetic variation in the *Arabidopsis thaliana* triploid bridge. *Genetics* 170: 1979-1988
50. **Dilkes BP** and Comai L 2004 A differential dosage hypothesis for parental effects in seed development. *Plant Cell* 16: 3174-3180
51. Hunter BG, Beatty MK, Singletary GW, Hamaker BR, **Dilkes BP**, Larkins BA and Jung R 2002 Maize opaque endosperm mutations create extensive changes in patterns of gene expression. *Plant Cell* 14:2591-2612
52. Gordon-Kamm WJ, **Dilkes BP**, Lowe KS, Hoerster G, Sun X, Ross M, Church L, Bunde C,

Farrell J, Hill P, Maddock S, Snyder J, Li X, Woo Y, Bidney D and Larkins BA 2002 Stimulation of the cell cycle and maize transformation by disruption of the plant retinoblastoma pathway. Proc. Natl. Acad. Sci. U S A 99: 11975-11980

53. **Dilkes BP**, Dante RD, Coelho C and Larkins BA 2002 Genetic analyses of endoreduplication in *Zea mays* endosperm: evidence of sporophytic and zygotic maternal control. Genetics 160: 1163-1177
54. Larkins BA, **Dilkes BP**, Dante RA, Coelho CM, Woo Y and Liu Y 2001 Investigating the hows and whys of DNA endoreduplication. J. Exp. Bot. 52: 183-192
55. Sun Y, **Dilkes BP**, Zhang C, Dante RA, Carneiro NP, Lowe KS, Jung R, Gordon-Kamm WJ and Larkins BA 1999 Characterization of maize (*Zea mays* L.) Wee1 and its activity in developing endosperm. Proc. Natl. Acad. Sci. U S A 96: 4180-4185
56. Choe S, **Dilkes BP**, Gregory BD, Ross AS, Yuan H, Noguchi T, Fujioka S, Takatsuto S, Tanaka A, Yoshida S, Tax FE and Feldmann KA 1999 The Arabidopsis *dwarf1* mutant is defective in the conversion of 24-methylenecholesterol to campesterol in brassinosteroid biosynthesis. Plant Physiol. 119: 897-907
57. Choe S, **Dilkes BP**, Fujioka S, Takatsuto S, Sakurai A and Feldmann KA 1998 The DWF4 gene of Arabidopsis encodes a cytochrome P450 that mediates multiple 22alpha-hydroxylation steps in brassinosteroid biosynthesis. Plant Cell 10: 231-243

#### **Book chapters authored (N=3)**

58. **Dilkes, BP** and Larkins BA 1999 "Transgenic plants: where is this technology leading us" in Biowork II (A. Borem, M.P. Giudice and N.S. Sakiyama, eds.), Federal University of Vicoso, Vicoso, Brasil, 213-240
59. **Dilkes BP** and Feldmann KA 1998 Cloning genes from T-DNA tagged mutants. Methods Mol. Biol. 82: 339-51
60. Schulz B, Bennett MJ, **Dilkes BP**, and Feldmann KA 1995 "T-DNA tagging in *Arabidopsis thaliana*: cloning by gene disruption" in Plant Molecular Biology Manual (Gelvin, S, ed.) Kluwer Academic Publishers, The Netherlands pp. K3:1-17

#### **Technical Publications**

61. Tuinstra M, Krothapalli K, **Dilkes B**, **Buescher E** 2017 Genetic mutations that disrupt dhurrin production in Sorghum. Priority 2012; Filed 2013; Issued 2017 U. S. Patent 9,512,437
62. **Best NB**, Hartwig T, Budka JS<sup>u</sup>, Schulz B, Weil C, and **Dilkes BP\*** 2016 New *nana plant1* (*na1*) allele. Maize Genetics Cooperative Newsletter Vol 90
63. Dilkes B, Johal G Chemical Mutagenesis. 61/983,708 APPLICATION Filed 2015.

64. **Best NB**, Budka JS<sup>U</sup>, Schulz B, Weil C, and **Dilkes BP\*** 2014 New EMS-induced allele of *terminal ear1 (te1)* allele in the B73 background. Maize Genetics Cooperative Newsletter.
65. Gordon-Kamm WJ, Lowe KS, Bailey MA, Gregory CA, Hoerster GJ, Larkins BA, **Dilkes B**, Burnett R and YM Woo 2007 Methods of using viral replicase polynucleotides and polypeptides. U.S. Patent 7,309,813
66. Gordon-Kamm WJ, Lowe KS, Larkins BA, **Dilkes B** and Y Sun 2007 Cell cycle nucleic acids, polypeptides and uses thereof. U.S. Patent 7,256,280
67. Gordon-Kamm WJ, Lowe KS, Gregory CA, Hoerster GJ, Larkins BA, **Dilkes B** and R Burnett 2004 Methods of using viral replicase polynucleotides and polypeptides. U.S. Patent 6,770,800
68. Sun Y, **Dilkes B**, Larkins BA, Lowe KS, Gordon-Kamm WJ and RA Dante 2004 Cell cycle nucleic acids, polypeptides and uses thereof. U.S. Patent 6,777,590
69. Gordon-Kamm WJ, Lowe KS Bailey MA, Gregory CA, Hoerster GJ, Larkins BA, **Dilkes B**, Burnett R and Y Woo 2002 Methods of using viral replicase polynucleotides and polypeptides. U.S. Patent 6,452,070
70. Gordon-Kamm WJ, Lowe KS Bailey MA, Gregory CA, Hoerster GJ, Larkins BA, **Dilkes B**, Burnett R and Y Woo 2001 Methods of using viral replicase polynucleotides and polypeptides. U.S. Patent 6,284,947

#### Unpublished work in progress

1. Zhan R, Leonard A, Singh A, **Best NB**, Penning BW, Chintamanani S, Sharma P, Carraro N, Multani DS, Balint-Kurti P, Li B, **Dilkes BP\***, Johal GS\* 201X A RIN4-family inhibitor counteracts a highly-inducible and autoactive NLR to control maize immunity. *In revision*
2. **Best NB**, **Addo-Quaye C**, Weil CP, Schulz B, Johal GS, **Dilkes BP**. 201x The nuclear pore complex component, *aladin1*, is necessary for asymmetric cell division in maize. *In revision*
3. **Khangura RS**, Venkata BP, Marla S, Mickelbart MV, Braun DM, Johal GS, **Dilkes BP** 201X Allelic interactions of induced and natural variation at *oil yellow1* impacts flowering time in maize Submitted <https://www.biorxiv.org/content/10.1101/706846v2>
4. Deans NC, Giacomelli BJ, **Addo-Quaye CA**, **Dilkes BP**, Hollick JB 201X Locus-specific paramutation in *Zea mays* is manifest by a chromodomain helicase DNA-binding 3 nucleosome remodeler controlling development and pollen function.
5. Huang L, Li X, Zhang W, Ung N, Li y, Yin X, **McEwan RE**, **Dilkes B**, Dai M, Raikhel NV, Staiger CJ, Zhang C1 201X The catalytic activity of plant cellulose synthases is essential for cellulose synthase complex subcellular trafficking Submitted

6. Jiao S, Chamberlin M, Carraro N, Beatty M, Thatcher S, Marla S, Wang-Nan H, Morris GP, Meeley B, Johal GS, Multani DS, **Khangura R** and **Dilkes BP** 201X *brachytic1 (br1)* encodes a monocot-specific MYB transcription factor that regulates maize shoot development
7. **Khangura RS**, Johal GS, and **Dilkes BP\*** 201X Genome wide association study of epistasis uncovers opposing reaction norms for the response of flowering to changes chlorophyll content and photosynthetic output in maize.
8. Shailesh K, Kim B-S, Kim S-B, **Brian D**, Johal G, Balint-Kurti P 201X Maize plants chimeric for an autoactive NLR display cell autonomous hypersensitive cell death but non-cell autonomous defense signaling.
9. Simpson J Wunderlich C, Sirius L, **Svedin-Harrison E**, **Dilkes BP\***, Chapple C\* 201X Metabolic source isotopic pair labeling and GWAS are complementary tools for the identification of metabolite-gene associations in plants
10. **Khangura R**, Johal G, Lisch D, **Dilkes BP\*** 201X Expression of plastid to nucleus retrograde signaling by *genomes uncoupled4* can be controlled by a tunable Mutator suppressible allele

### **INVITED PRESENTATIONS**

“Illuminating unknowns in metabolism through contemplation of a single blade of grass”  
Gordon Research Conference, 2019

“Suffering fools gladly” University of Arizona Larkins Lab Scientific Celebration, 2019

“Alkylations I Have Known and Loved: Functional Annotation of Unknowns via Genetic Interaction” UC Davis Genetics, 2019

“The genetics of known unknowns: Federating data across disciplines to provide molecular insights” Michigan State University, 2018

“TBA (where is the Dilkes lab going and what will they do when they get there)” Purdue University, Department of Biochemistry 2018

“The known unknowns of plant metabolism” University of Missouri, IPG Meeting 2018

“Genetics as atom smasher: testing longstanding hypotheses at gene-level resolution”  
University of Utah, October 2017

“Data has a right to people: structure function relationships in genomics” Dow Agrosiences,  
Zionsville, Indiana 2017

“Mapping the known unknown: using genetics to discover gene function” UC Davis, Davis CA  
Jan 2017.

“Genetics of species barriers” Clemson University, Clemson SC October 2016



“Mapping the known unknown for novel metabolism and gene function discovery “ Society for Experimental Biology meeting, Brighton, UK. June 2016

“Questions have a right to data: questioning assumptions in adaptation and speciation” West Virginia University, Jan 2016

“Questions have a right to data: testing assumptions in adaptation and speciation” University of Florida, April 2015

“Known unknowns: testing assumptions in the genetics of plant speciation, polyploidy, and adaptation” University of Massachusetts, Amherst MA, Feb 2015

“Development of Genome Resources” Mint Industry Research Council Meeting, January 2015

“Polyploidy and the enigma of adaptation and speciation” October 2014, University of Georgia

“The path forward for Mint improvement” Mint Industry Research Council Science Advisory meeting, Boston, September 2014

“What the family tree of mint can tell us about the path to improvement” August 2014 UC Davis

“Next generation genetics for EMS variation induced lines of crops” Cold Spring Harbor Labs China, April 2014

“What the family tree of mint tells us about the route to improvement” Mint Industry Research Council Meeting, January 2014

“Next generation sequencing and doubled haploid breeding: integrating genomics” CIMMYT, Texcoco, Mexico, March 2013

“Use of Doubled Haploid lines in maize genetics and genomics” CIMMYT, Texcoco, Mexico, August 2012

“The study of plant adaptation to toxic metals rediscovers a regulatory molecule in plants” Aberdeen invited June 2012

“Bioinformatics for next generation genetics” Purdue University, Bioinformatics Seminar West Lafayette, IN 2012

“Fitness tradeoffs between potassium limitation and polyploidy in Arabidopsis” Wabash College, Crawfordsville, IN 2012

“From atoms to genomes” PAG 2012 Conference, San Diego, CA 2012.

“Simple formulas for next generation genetics and gene discovery” Monsanto Corporation, St Louis, MO 2011

“Mechanistic insights into long-standing problems in plant biology” Department of Horticulture and Landscape Architecture, Purdue University, West Lafayette, IN 2011

“Dosage dependent mechanisms in hybridization barriers” Crop Science Department, University

- of Illinois, Urbana-Champaign, IL 2011
- “Evolution works: gene function discovery in wild-caught plants” Department of Biochemistry, Purdue University, West Lafayette, IN 2011
- “Bioinformatics and then what: simple formulas for next generation genetics” Purdue-DAS workshop West Lafayette, IN 2011
- “Dosage sensitive genetic mechanisms in hybridization barriers” Donald Danforth Plant Science Center, St. Louis, MO 2011
- “Dosage sensitive mechanisms of seed lethality” Indiana University, Department of Biology, Bloomington, IN 2010.
- “Why can’t we get along? Hybridization barriers in the flowering plants” Donald Danforth Plant Science Center, St. Louis, MO 2010
- “Post-zygotic mating isolation in plants” University of Chicago. Department of Evolution and Ecology, Chicago, IL 2010
- “Pruning the Mint Family Tree” Midwestern Mint Grower’s Meeting. West Lafayette, IN. 2010
- “Pruning the Mint Family Tree” and “Breeding for a Family Reunion: Balance and Breeding in *Mentha*” Mint Industry Research Council meeting Las Vegas, NV 2010
- “Using natural variation to dissect the effects of genome dosage on endosperm cellularization and seed size” DOW AgroSciences, Zionsville, IN 2010
- “Researcher (forward looking) perspective on Open Access” Purdue Library special discussion on Open Access in scholarship Purdue University, West Lafayette, IN 2009
- “Exploiting natural variation in post-mating isolation to identify genes involved in endosperm balance” Department of Botany and Plant Pathology, Purdue University, West Lafayette, IN 2009
- “Practical Advice for Next Generation Sequencing: experimental design and execution” Horticulture Departmental Retreat, West Lafayette, IN 2009
- “Genetics of Species Barriers in *Arabidopsis*” Bioinformatics Seminar, Purdue University, West Lafayette, IN 2009
- “Genetic networks and the molecular biology of plant speciation” Botanical Society of America Meeting, Vancouver BC 2008
- “Genomics of speciation in *Arabidopsis*” International Congress of Brassica Research, Lillehammer, Norway 2008
- “The genetics of reproductive isolation” Purdue University, West Lafayette, IN, 2008
- “Maternal to paternal ploidy balance – effects on seed size” Translational Seed Biology Meeting, Davis, CA 2007

- “The interploidy hybridization barrier is controlled by a genetic network” International Conference on Polyploidy Heterosis and Epigenetics, Beijing, China, 2007
- “Polyploidy-regulated hybridization barriers” Plant Animal Genome Conference, San Diego, CA 2007
- “Genome dosage effects in sexual hybridization barriers” Genome Center, UC Davis, Davis, CA 2006
- “*Dr. Strangelove*, or how I learned to stop worrying and love hybridization barriers” Washington University, St. Louis, MO 2006
- “*Dr. Strangelove, Weapons of Mass Destruction*, and the interploidy hybridization barrier” Purdue University, West Lafayette, IN 2006
- “Dosage effects in interploidy crosses of Arabidopsis” Banbury Conference on Gene Dosage Polyploidy and Heterosis, Cold Spring Harbor NY 2005
- “Ploidy hybridization barriers: genotype x karyotype interaction” Plant and Animal Genome Conference, San Diego, CA 2005
- “Epigenetics of Arabidopsis polyploids: gene x genome interactions” Epigenetics Seminar Series Fred Hutchinson Cancer Research Center, Seattle, WA 2004
- “Cell cycle regulation mediated by maize Rb1 and viral interactors” Maize Genetics Conference, Lake Geneva, WI 2001
- “Cell cycle control in endoreduplicating maize endosperm” Annual meeting of the American Society of Plant Physiology, Baltimore, MD 2000
- “Zea and the art of cell cycle control” Pioneer Hi-Bred Intl., Johnston, IA 1999

## **FUNDERS**

### **Current**

Agency	USDA - BARD
Title	“Identifying molecular markers for defense metabolites in wild emmer wheat against aphids feeding”
Duration	2018-2020
Total amount of award	\$75,000 to Purdue
Role:	Co-PI with Dr. Vered Tzin, Ben Gurion University
Agency	National Science Foundation
Title	“Collaborative Research: Root-to-Shoot Communication via the bps signal”
Duration	2018-2024
Total amount of award	\$294,000
Role:	PI
Agency	Center For Plant Biology Seed Grant
Title	“Genetic and physiological mechanisms underlying genotype by environment interactions for fitness”
Duration	2017-2018

Total amount of award	\$50,000
Role:	Co-PI with Chris Oakley; funds not split between labs \$8,058 to Dilkes lab salaries
Agency	Center For Plant Biology Seed Grant
Title	"Genome-wide characterization of signaling in maize pollination"
Duration	2017-2018
Total amount of award	\$50,000
Role:	Co-PI with Sharon Kessler; funds not split between labs \$8,058 to Dilkes lab salaries
Agency	National Institutes of Health
Title	"Characterization of MDM2 in Craniofacial Development"
Duration	2017-2019
Total amount of award	\$226,800
Role:	Co-PI with Susan Mendrysa; \$30,000 to Dilkes
Agency	AgSeed
Title	"Low cost high resolution knockout of every gene in maize"
Duration	2017-2019
Total amount of award	\$75,000
Role:	Co-PI with Damon Lisch; funds not split between labs
Agency	USDA/NIFA AFRI
Title	"Brassinosteroids interact with gibberellic acid and strigolactones to control maize plant architecture"
Duration	2017-2019
Total amount of award	\$80,000 to Purdue
Role:	Graduate Advisor of Pre-Doctoral Fellow
Agency	National Science Foundation
Title	"The genetic and genomic exploration of the maize HR response"
Duration	2015-2019
Total amount of award	\$1,900,000 to Purdue
Role:	Co-PI

### Complete

Agency	National Science Foundation
Title	"EAGER: Predicting drought adaptation in C4 plants with high throughput quantitative phenotyping"
Duration	2014-2016
Total amount of award	\$300,000
Role:	PI
Agency	Showalter Foundation
Title	"Precise and efficient identification of rare disease-relevant alleles in mouse
Duration	2014-2015
Total amount of award	\$78,000
Role:	PI
Agency	Indiana Soybean Alliance

Title "A Gene Discovery Pipeline for Soybean Seed Composition Traits"  
Duration 2014-2015  
Total amount of award \$75,000  
Role: co-PI; Directly responsible for \$44,000

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Agency Mint Industry Research Council  
Title "Evolutionary breeding in *Mentha*"  
Duration 2014-2015  
Total amount of award \$103,000  
Role: PI

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Agency USAID:Sorghum Millet Innovation Lab  
Title "Platform for Forward and Reverse Genetics in Sorghum"  
Duration 2014-2019  
Total amount of award \$1,200,000  
Role: co-PI; Travel funds and Salary are included to support me as a consulting bioinformatician on this project.

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Agency Purdue University Cancer Center  
Title "Accurate and rapid detection of mutations in mouse colon tumors"  
Duration 2014-2016  
Total amount of award \$30,000  
Role: Co-PI; Directly responsible for \$10,000

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Agency AgAlumni Seed  
Title "Maize Genetic Research"  
Duration Unlimited  
Total amount of award \$10,000  
Role: PI

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Agency Bill and Melinda Gates Foundation  
Title "Developing a Functional Gene Discovery Platform for Sorghum Improvement"  
Duration 2012-2015  
Total amount of award \$1,000,000  
Role: Co-PI; Directly responsible for \$170,000

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Agency USDA/NIFA - AFRI  
Title "Maize endosperm development is affected by small RNA in interploidy crosses"  
Duration 2012-2014  
Total amount of award \$135,000  
Role: Mentor; Post Doctoral Fellowship for Dr. Elizabeth Buescher

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*Support Prior to joining Purdue in 2009*

Agency NIH R01 GM076103-01A1  
Title "Dosage-dependent regulation in hybridization"  
Duration 2006-2011  
Role: Senior Personnel

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Agency NSF Plant Genome Research  
Title “Functional genomics of plant polyploids”  
Duration 2005-2010  
Role: Project Manager

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Agency USDA-CREES-NRI 2003-35300-13248  
Title “Functional genomic analysis of plant responses to autopolyploidy”  
Duration 2003-2005  
Role PI – Post Doctoral Fellowship

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### **TEACHING EXPERIENCE**

#### **Undergraduate level**

Instructor of record BCHM 290 (2016- ) – Experimental Design. This is a required course for all Biochemistry majors.

Instructor of record AGRY 320 (2010-2012) – Introduction to Genetics. Required course for College of Agriculture life science majors (Botany, Hort Science, Breeding and Genetics, Animal Science, Pre-Vet, Biochemistry, Youth Development and Ag. Education).

Lecture on DNA sequencing and natural variation in BIOL 481 at Purdue University

Laboratory sections of PLS312 (plant genetics; two semesters), BIO181 (introductory biology for majors; two semesters), and PLS100-H (Honors introductory plant sciences; one semester) while a graduate teaching assistant at the University of Arizona.

Guest lecture in Introductory Plant Sciences PLS100 H on “Water Potential, Transpiration, and Water Use Efficiency” 1997.

Co-taught a self defense course within the Experimental College at Oberlin College.

Research supervision of ten undergraduates at Purdue. Previously, I mentored three undergraduates at University of Arizona, five at the University of Washington, and one at the University of California at Davis.

#### **Graduate level**

Masters thesis advisor for E. Svedin-Harrison

Ph. D. thesis advisor for M. Silva, N. B. Best, and Krittikhan Chanpaisaeng

Currently advising PhD students R. McEwan, R. Benke, and A. Nestor

Current Graduate Committee member for 8 Ph. D. students

Graduate Committee member for 9 Ph. D. and 5 M. S. awarded degrees

Instructor AGRY530 (2009-2015) – Advanced plant genetics

Guest instructor in HORT 601 “The role and evolution of the Library in modern science scholarship”

Developed and delivered a 4 day short course integrating genomics into plant breeding education at the West African Center for Crop Improvement 2013 and 2014. Co developed with Dilkes Lab Postdoc Charles Addo-Quaye.

Short course instructor for doubled haploid breeding course developed by Dilkes Lab Postdoc Vijay Chaikam, at CIMMYT, Texcoco Mexico 2011 and 2012.

Guest instructor for PLB292 a seminar-style mandatory graduate course in The Section of Plant Biology at the University of California, at Davis 2007.

Various lectures in BIO527 a seminar-style plant molecular biology course in the Department of Biology at the University of Washington 2003-2006.

Lecture in BIOC533 a seminar-style minicourse on nuclear structure and organization in the Department of Biochemistry at the University of Washington Medical School 2005.

Research supervision of the Diplom Thesis project of Renate Weizbauer from the University of Cologne, done in Seattle 2005-2006.

### **SYNERGISTIC ACTIVITIES and SERVICE**

Departmental committee work 2009-present

Graduate Admissions and Recruitment 2016-present

Cancer Genomics search committee 2016

Plant Genetics and Breeding faculty search 2013

Epigenetics faculty search, Dept. Horticulture 2011-2013

Chair Research Seminar Committee, Dept. Horticulture 2009-2010

Specialty Crops Genetics faculty search, Dept. Horticulture 2009-2010

Research Seminar Committee member, Dept. Horticulture 2009-2012

University activity at Purdue 2009-Present

Faculty Chair, Purdue Genomics Facility Advisory Board 2012-present

Center for Molecular Agriculture Search 2015-2016

Biochemistry subcommittee

Evolution and Ecology subcommittee

Faculty Fellow for Wiley Residence Hall SW3 2013-2016

Systems Biology Cluster Hire Master Committee 2012-2013

Associate Professor COACHE survey working committee 2016

ITAP Operational Oversight Committee 2015-2017

College of Agriculture Agenda and Policy Committee 2014-2015

Systems Biology Cluster Hire Master Committee 2012

Plant Biology vision committee 2012 – *successful in oh so many ways, not least of all in writing something down and turning it in*

Epigenetics faculty search, plant cluster subcommittee 2012-2013

John J. Carty award nomination for Jian-Kang Zhu 2015

McCoy Award nomination for Jian-Kang Zhu 2015, 2016

McCoy Award nomination for Natalia Dudareva 2012, 2018

Member Plant Science Initiative Committee, College of Agriculture 2010 *successful*

Distinguished Ag Alumni nomination for Craig Pikaard 2010 - *successful*

McCoy Award nomination and presentation for David Salt 2010 - *successful*

#### Society membership and activity

American Society for Plant Biology, member

Genetics Society of America, member

American Association for the Advancement of Science, member

International Consortium for Arabidopsis Research

Co-chair of the Natural Variation Committee 2010-present

Maize Genetics Editorial Board 2011

National Evolutionary Synthesis Center, Cephalopod Genomics Working Group 2012

Academic Editor for PLoS One 2006-2010

Ad-hoc reviewer for Science, Genetics, Genome Research, Molecular Ecology, PLoS One, The Plant Cell, Molecular Plant, Plant Physiology, The Plant Journal, Plant Molecular Biology, The New Phytologist, Trends in Plant Science, and Plant Methods.

Grant Panelist United States Department of Energy 2009

Grant Panelist National Science Foundation, United States of America 2011,2015

Ad-hoc reviewer for Genome Canada, National Science Foundation, United States Department of Agriculture, and United States Department of Energy, Israeli Science Foundation.

University of Washington Royalty Research Fund reviewer (2005-2006)

Founding member and Tri-Chair of the University of Washington Post-Doctoral Association 2005-2006

Frequent panelist in efforts to educate graduate students about selecting high-quality postdoctoral training opportunities. Done for the UW Graduate School, UW Biology Department and HHMI 2004-2006 and Purdue University 2009

Co-organizer and participant in the Howard Hughes Medical Institute-sponsored workshop "Future Faculty Fellows" at the University of Washington 2004

Founding member of Goober Biofuels Racing 2007-2015