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## 1. PROFESSIONAL EXPERIENCE & EDUCATION

### PROFESSIONAL EXPERIENCE

#### *CURRENT POSITIONS*

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**USDA-ARS Plant Genetics Research Unit** 2009-present  
St. Louis, Missouri  
Research Computational Biologist

**Donald Danforth Plant Science Center** 2015-present  
St. Louis, Missouri  
Associate Member

**Washington University** 2012-present  
St. Louis, Missouri  
Adjunct Assistant Professor

**University of Missouri** 2012-present  
Columbia, Missouri  
Adjunct Assistant Professor

#### *PREVIOUS EXPERIENCE*

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**Donald Danforth Plant Science Center** 2009-2015  
St. Louis, Missouri  
Assistant Member

**Purdue University** 2006-2009  
Bindley Bioscience Center  
West Lafayette, Indiana  
Senior Research Associate

### EDUCATION

#### *POST-GRADUATE*

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**Postdoctoral Researcher** 2004-2006  
Purdue University  
Center for Phytoremediation Research and Development  
Bindley Bioscience Center  
West Lafayette, Indiana

*GRADUATE & UNDERGRADUATE*

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DOCTOR of PHILOSOPHY	May 2004
Graduate Student, Cell Biology Department Laboratory of Jeffrey F. Harper The Scripps Research Institute (TSRI) La Jolla, California	2000-2004
Graduate Student, Molecular Biology Department Laboratory of James R. Williamson The Scripps Research Institute (TSRI) La Jolla, California	1998-2000
Graduate Student, Department of Chemistry Laboratory of James R. Williamson Massachusetts Institute of Technology Cambridge, Massachusetts	1996-1997
<b>Bachelor of Arts in Chemistry</b> General Honors, Honors in Chemistry Goucher College Towson, Maryland	1992-1996

## 2. PUBLICATIONS

### 2016

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- (1) Sawers, R. J. H., Svane, S. F., Quan, C., Grønlund, M., Wozniak, B., Gebreselassie, M.-N., González-Muñoz, E., Chávez Montes, R. A., **Baxter, I.**, Goudet, J., Jakobsen, I. and Paszkowski, U. (2017), Phosphorus acquisition efficiency in arbuscular mycorrhizal maize is correlated with the abundance of root-external hyphae and the accumulation of transcripts encoding PHT<sub>1</sub> phosphate transporters. *New Phytol.* doi:10.1111/nph.14403
- (2) Asaro A, Ziegler G, Ziyomo C, Hoekenga O, Dilkes BP, **Baxter I.** The interaction of genotype and environment determines variation in the Maize kernel ionome. (2016) *G3* g3.116.034827; Early Online October 21, 2016, doi:10.1534/g3.116.034827.
- (3) Huber S, Li K, Nelson R, Ulyanov A, DeMuro C, **Baxter I.** (2016) Canopy position has a profound effect on soybean seed composition. *PeerJ* 4:e2452; 2016 September 13. doi:10.7717/peerj.2452.
- (4) Shakoob N, Ziegler G, Dilkes B, Brenton Z, Boyles R, Connolly E, Kresovich S, **Baxter I.** (2016) Integration of experiments across diverse environments identifies the genetic determinants of variation in sorghum bicolor seed element composition. *Plant Physiology*, Volume 170, no. 4, 1989-1998.

- (5) Sebastian J, Yee MC, Viana WG, Rellán-Álvarez R, Feldman M, Priest HD, Trontin C, Lee T, Jiang H, **Baxter I**, Mockler TC. (2016) Grasses suppress shoot-borne roots to conserve water during drought. *Proceedings of the National Academy of Sciences*. 2016 Jul 15;201604021.

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**2015**

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- (6) Fahlgren N, Feldman M, Gehan MA, Wilson MS, Shyu C, Bryant DW, Hill ST, McEntee CJ, Warnasooriya SN, Kumar I, Ficor T, Turnipseed S, Gilbert KB, Brutnell TP, Carrington JC, Mockler TC, **Baxter I**. A versatile phenotyping system and analytics platform reveals diverse temporal responses to water availability in *Setaria*. *Molecular Plant.*, Volume 8, Issue 10, pp 1520-1535.
- (7) Ziegler G, Hartstock R, **Baxter I**. (2015) Zbrowse: an interactive GWAS results browser. *Peer J Computer Science* 1:e3.
- (8) Krishnan H, Kim W, Oehrle N, Alaswad A, **Baxter I**, Wiebold W, Nelson R. (2015) Introgression of Leginsulin, a Cysteine-Rich Protein, and High-Protein Trait from an Asian Soybean Plant Introduction Genotype into a North American Experimental Soybean Line. *J. Agric. Food Chem.*, 63(11), pp 2862-2869. DOI 10.1021/j505202z.
- (9) Pu H, Feldman M, Schroder S, Bahri BA, Diao X, Zhi H, Estep M, **Baxter I**, Devos KM, Kellogg EA. (2014) Population genetics of *Setaria viridis*, a new model system. *Mol Ecol* 23(20): 4912-4925. doi: 10.1111/mec.12907.
- (10) Kusano M, **Baxter I\***, Fukushima A, Oikawa A, Okazaki Y, Nakabayashi R, Bouvrette D, Achard F, Jacobowski A, Ballam J, Harrigan GG, Saito K. (2015) Assessing Metabolomic and Chemical Diversity of a Soybean Lineage Representing 35 Years of Breeding. \*co-corresponding author *Metabolomics* 11 (2): 261-270. DOI 10.1007/s11306-014-0702-6.

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**2014**

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- (11) **Baxter I\***, Ziegler G, Lahner B, Mickelbart MV, Foley R, Danku J, Armstrong P, Salt DE and Hoekenga OA. (2014) Single-kernel ionic profiles are highly heritable indicators of genetic and environmental influences on elemental accumulation in maize grain (*Zea mays*). *PLoS One* 9(1): e87628. doi: 10.1371/journal.pone.0087628. \*corresponding author
- (12) Zhang M, Pinson, S, Tarpley L, Huang XY, Lahner B, Yakubova E, **Baxter I**, Guerinot M, Salt DE. (2014) Mapping and validation of quantitative trait loci associated with concentrations of 16 elements in unmilled rice grain. *Theor. Appl. Genet.* 127: 137-165. doi: 10.1007/s00122-013-2207-5.

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**2013**

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- (13) Gillman JD, **Baxter I**, Bilyeu K. (2013) Phosphorus partitioning of soybean lines containing different mutant alleles of two soybean seed-specific (*Glycine max* (L.) Merr) ATP-binding cassette phytic acid transporter homeologs. *Plant Genome* 6(1): 1-10. doi:10.3835/plantgenome2012.06.0010.

- (14) Shen, M., Broeckling, C.D., Chu, E.Y., Ziegler, G., **Baxter, I.R.**, Prenni, J.E., and Hoekenga, O.A. (2013). Leveraging non-targeted metabolite profiling via statistical genomics. *PLoS One* 8(2): e57667. doi:10.1371/journal.pone.0057667.
- (15) McDowell, S.C., Akmakjian, G., Sladek, C., Mendoza-Cozatl, D., Morrissey, J.B., Saini, N., Mittler, R., **Baxter, I.**, Salt, D.E., Ward, J.M., Schroeder, J.I., Guerinet, M.L., and Harper, J.F. (2013). Elemental concentrations in the seed of mutants and natural variants of *Arabidopsis thaliana* grown under varying soil conditions. *PLoS One* 8(5): e63014. doi: 10.1371/journal.pone.0063014
- (16) **Baxter I\***, Gustin J, Settles AM, Hoekenga OA. (2013) Itonomic characterization of maize kernels in the intermated B73 x Mo17 (IBM) population. *Crop Sci.* 53(1): 208-220. doi: 10.2135/cropsci2012.02.0135. \*co-corresponding author
- (17) Ziegler G, Terauchi A, Becker A, Armstrong P, Hudson K, **Baxter I.** (2013) Itonomic screening of field-grown soybeans identifies mutants with altered seed elemental composition. *Plant Genome* 6: 1-9. doi: 10.3835/plantgenome2012.07.0012.

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**2012**

- (18) Yu D\*, Danku J\*, **Baxter I\***, Kim S, Vatamaniuk OK, Vitek O, Ouzzani, M, Salt DE. (2012) High-resolution genome-wide scan of genes, gene-networks and cellular systems impacting the yeast ionome. *BMC Genomics* 13(1): 623. doi: 10.1186/1471-2164-13-623. \*Contributed equally.
- (19) Chao D-Y, Silva A, **Baxter I**, Huang YS, Nordborg M, Danku J, Lahner B, Yakubova E, Salt DE. (2012) Genome-wide association studies identify heavy metal ATPase3 as the primary determinant of natural variation in leaf cadmium in *Arabidopsis thaliana*. *PLoS Genet.* 8(9): e1002923. PMID: PMC3435251. doi: 10.1371/journal.pgen.1002923.
- (20) Muhlemann JK, Maeda H, Chang CY, San Miguel P, **Baxter I**, Cooper B, Perera MA, Nikolau BJ, Vitek O, Morgan JA, Dudareva N. (2012) Developmental changes in the metabolic network of snapdragon flowers. *PLoS ONE* 7(7): e40381. doi: 10.1371/journal.pone.0040381.
- (21) **Baxter I\***, Hermans C, Lahner B, Yakubova E, Tikhonova, Verbruggen N, Chao DY, Salt DE. (2012) Biodiversity of mineral nutrient and trace element accumulation in *Arabidopsis thaliana*. *PLoS One* 7(4): e35121. doi:10.1371/journal.pone.0035121. \*corresponding author
- (22) Krishnan HB, Jang S, **Baxter I**, Wiebold WJ. (2012) Growing location has a pronounced effect on the accumulation of cancer chemopreventive agent Bowman-Birk inhibitor in soybean seeds. *Crop Sci* 52: 1786-1794. doi: 10.2135/cropsci2011.11.0593.

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**2011**

- (23) Yu D, Danku J, **Baxter I**, Kim S, Vatamaniuk OK, Salt DE, Vitek O. (2011) Noise reduction in genome-wide perturbation screens using linear mixed-effect models. *Bioinformatics* 27(16): 2173-2180. doi: 10.1093/bioinformatics/btr359.
- (24) Chao DY, Gable K, Chen M, **Baxter I**, Dietrich C, Cahoon E, Guerinet ML, Lahner B,

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Lu S, Markham J, Morrissey J, Han G, Gupta S, Harmon J, Jaworski J, Dunn T, Salt DE. (2011) Sphingolipids in the root play an important role in regulating the leaf ionome in *Arabidopsis thaliana*. *Plant Cell* 23: 1061-1081. doi: 10.1105/tpc.110.079095.

- (25) Becker A\*, Chao DY, Zhang X, Salt DE, **Baxter I**. (2011) Bulk segregant analysis using single nucleotide polymorphism microarrays. *PLoS One* 6(1): e15993. doi:10.1371/journal.pone.0015993. \*undergraduate

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## 2010

- (26) Tian H, **Baxter I**, Lahner B, Reinders, A, Salt DE, and Ward JM. (2010) *Arabidopsis* NPCC6/NaKR1 is a phloem mobile metal binding protein necessary for phloem function and root meristem maintenance. *Plant Cell* 22: 3963-3979. doi:10.1105/tpc.110.080010.
- (27) **Baxter I**, Brazelton J, Yu D, Huang Y, Lahner B, Nordborg M, Vitek O, Salt DE. (2010) A coastal cline in sodium accumulation in *Arabidopsis thaliana* is driven by natural variation of the sodium transporter AtHKT1;1. *PLoS Genet* 6(11): e1001193. doi:10.1371/journal.pgen.1001193. With accompanying perspective by Anderson JT and Mitchell-Olds T, "Beyond QTL Cloning" *PLoS Genet.* 6(11): e1001197. doi:10.1371/journal.pgen.1001197.
- (28) Buescher E, Achberger T, Amusan I, Giannini A, Ochsenfeld C, Rus A, Lahner B, Hoekenga O, Yakubova E, Harper JF, Guerinot ML, Zhang M, Salt DE, **Baxter IR**. (2010) Natural genetic variation in selected populations of *Arabidopsis thaliana* is associated with ionic differences. *PLoS ONE* 5(6): e11081. doi:10.1371/journal.pone.0011081.
- (29) Atwell S, Huang Y, Vilhjálmsson B, Willems G, Horton M, Li Y, Meng D, Platt A, Tarone A, Hu T, Jiang R, Muliyati W, Zhang X, Amer M, **Baxter I**, Brachi B, Chory J, Dean C, Debieu M, de Meaux J, Ecker J, Faure N, Kniskern J, Jones J, Michael T, Nemri A, Roux F, Salt D, Tang C, Todesco M, Traw B, Weigel D, Marjoram P, Borevitz J, Bergelson J, and Nordborg M. (2010). Genome-wide association study of 107 phenotypes in a common set of *Arabidopsis thaliana* inbred lines. *Nature* 465: 627-631. doi: 10.1038/nature08800.

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## 2009

- (30) **The International Brachypodium Initiative** (2009). Genome sequencing and analysis of the model grass *Brachypodium distachyon*. *Nature* 463: 763-768.
- (31) Morrissey J, **Baxter I**, Lee J, Li L, Lahner B, Grotz N, Kaplan J, Salt DE, Guerinot ML (2009) The ferroportin metal efflux proteins function in iron and cobalt homeostasis in *Arabidopsis*. *Plant Cell* 21: 3326-3338. doi: 10.1105/tpc.109.069401.
- (32) **Baxter I**, Hosmani PS, Rus A, Lahner B, Borevitz JO, Muthukumar B, Mickelbart MV, Schreiber L, Franke RB, Salt DE (2009) Root suberin forms an extracellular barrier that affects water relations and mineral nutrition in *Arabidopsis*. *PLoS Genet.* 5(5): e1000492. doi: 10.1371/journal.pgen.1000492.

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## 2008

- (33) Danku J, Gumaelius L, **Baxter I**, Salt DE. (2008) A high-throughput method for

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*Saccharomyces cerevisiae* (yeast) ionomics. *J. Anal. At. Spectrom.* 24: 103-107. doi: 10.1039/b803529f.

- (34) **Baxter I**, Vitek O, Lahner B, Muthukumar B, Borghi M, Morrissey J, Guerinot ML, Salt DE. (2008) The leaf ionome as a multivariable system to detect a plant's physiological status. *Proc. Natl. Acad. Sci. USA* 105(33): 12081-12086. Faculty of 1000 Factor: 6.0, Must Read.
- (35) **Baxter I**, Muthukumar B, Park HC, Buchner P, Lahner B, Danku J, Zhao K, Lee J, Hawkesford MJ, Guerinot ML, Salt DE. (2008) Variation in molybdenum content across broadly distributed populations of *Arabidopsis thaliana* is controlled by a novel mitochondrial molybdenum transporter (MOT1). *PLoS Genet.* 4(2): e1000004. doi: 10.1371/journal.pgen.1000004. Faculty of 1000 Factor: 6.0, Must Read.
- (36) Eltabakh MY, Ouzzani M, Aref WG, Elmagarmid AK, Laura-Silva Y, Salt DE, **Baxter I**. (2008) Managing biological data using bdbms. *IEEE International Conference on Data Engineering*.

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#### 2007

- (37) Borevitz JO, Michael TP, Hazen SP, Morris GP, **Baxter I**, R, Hu TT, Chen H, Werner J, Salt DE, Kay SA, Chory J, Weigel D, Nordborg M, Jones JDG, Ecker JR. (2007) Genome-wide patterns of single feature polymorphism in *Arabidopsis thaliana*. *Proc. Natl. Acad. Sci. USA* 104(29): 12057-12062.
- (38) **Baxter I**, Ouzzani M, Orcun S, Kennedy B, Jandhyala SS, Salt DE. (2007) Purdue Ionomics Information Management System (PIIMS). An integrated functional genomics platform. *Plant Physiol.* 143: 600-611.

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#### 2006

- (39) Rus A, **Baxter I**, Muthukumar B, Gustin J, Lahner B, Yakubova E, Salt DE. (2006) Natural variants of AtHKT1 enhance Na<sup>+</sup> accumulation in two wild populations of *Arabidopsis*. *PLoS Genet.* 2(12): e210. doi: 10.1371/journal.pgen.0020210. Faculty of 1000 Factor: 4.9, Must Read.

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#### 2005

- (40) **Baxter I**, Young JC, Armstrong G, Foster N, Bogenschutz N, Cordova T, Peer WA, Hazen SP, Murphy AS, Harper JF. (2005) A plasma membrane H<sup>+</sup>-ATPase is required for the formation of proanthocyanidins in the seed coat endothelium of *Arabidopsis thaliana*. *Proc. Natl. Acad. Sci. USA* 102: 2649-2654.
- (41) Hazen SP, Pathan MS, Sanchez A, **Baxter I**, Dunn M, Estes B, Chang HS, Zhu T, Kreps JA, Nguyen HT. (2005) Expression profiling of rice segregating for drought tolerance QTLs using a rice genome array. *Funct. Integr. Genomics* 5(2): 104-116.

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#### 2003

- (42) **Baxter I**, Tchieu J, Sussman MR, Boutry MR, Palmgren MG, Gribskov M, Harper JF, Axelsen KB. (2003) Genomic comparison of P-type ATPase ion pumps in *Arabidopsis* and rice. *Plant Physiol.* 132(2): 618-628.

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#### 2001

- (43) Vitart V, **Baxter I**, Doerner P, Harper JF. (2001) Evidence for a role in growth and salt resistance of a plasma membrane H<sup>+</sup>-ATPase in the root endodermis. *Plant J.* 27: 191–201

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1998

- (44) Hegmans A, Sabat M, **Baxter I**, Freisinger E, Lippert B. (1998) Synthetic ways to tris(nucleobase) complexes derived from cis-diammineplatinum(ii) and a platinum(ii) complex containing four different ligands, three of which are nucleobases. *Inorg. Chem.* 37(19): 4921–4928

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### Submitted

Addo-Quaye C, Buescher E, Chaikam V, Best N, Baxter I, Dilkes B. Forward genetics by sequencing EMS variation induced inbred lines. Submitted to *G3*. <http://dx.doi.org/10.1101/045427>

Ziegler, G R, Nelson R, Granada S, Krishnan H B, Gillman J D, Baxter I. Genome-Wide Association Study of Ionomics Traits on Diverse Soybean Populations from Germplasm Collections. Submitted to *G3*. <http://biorxiv.org/content/early/2016/10/07/079731>

Feldman M J, Paul R E, Banan D, Barrett J F, Sebastian J, Yee M, Jiang H, Lipka A E, Brutnell T P, Dinneny J R, Leakey A D B, Baxter I. Time dependent genetic analysis links field and controlled environment phenotypes in the model C<sub>4</sub> grass *Setaria*. doi: <http://dx.doi.org/10.1101/083865>. Submitted to *PLoS Genetics*.

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### Reviews

- (1) Fahlgren N, Gehan M, **Baxter I**. (2015) Lights, camera action: high-throughput plant phenotyping is ready for a close-up. *Curr Opin Plant Biol* 24:93-99. doi: 10.1016/j.pbi.2015.02.006
- (2) **Baxter I**. (2015) Should we treat the ionome as a combination of individual elements, or should we be deriving novel combined traits? *J Exp Bot* doi: 10.1093/jxb/erv040
- (3) **Baxter I** and Dilkes BP. (2012) Elemental profiles reflect plant adaptations to the environment. *Science*, 36: 1661. doi: 10.1126/science.1219992.
- (4) **Baxter I**. (2010) Ionomics: The functional genomics of elements. *Brief Funct. Genomic Proteomic.* 9(2): 149-156.
- (5) **Baxter I**. (2009) Studying the social network of mineral nutrients. *Curr Opin. Plant Biol.* 12(3): 381-386.
- (6) Gueriot, ML, **Baxter I**, Salt DE. (2009) From the ionome to the genome: Identifying gene networks that control the mineral content of plants. In *Plant Systems Biology*. Coruzzi G and Gutierrez R, eds. Wiley-Blackwell.
- (7) Lahner B, **Baxter I**, Salt DE. (2008) Ionomics and the study of the plant ionome. *Annu. Rev. Plant Biol.* 59: 709–733.
- (8) **Baxter I**. R and Borevitz JO. (2006) Mapping a plant's chemical vocabulary. *Nat. Genet.* 38(7): 737–738.
- (9) Peer WA, **Baxter I**, R Richards EL, Freeman JL, Murphy AS. (2005) Phytoremediation and hyperaccumulator plants. In *Molecular Biology of Metal Homeostasis and Detoxification. Topics in Current Genetics*, Vol. 14, Tamas M and Martinoia E, eds. Springer, Berlin, pp. 299–340.

### 3. EXTERNALLY FUNDED RESEARCH



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## **Current AWARDED FUNDING**

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**A Systems-Level Analysis of Drought and Density Response in the Model C<sub>4</sub> Grass *Setaria viridis***, Tom Brutnell PI, Department of Energy, 10/01/2012-09/30/2017, (\$12,140,437). Baxter lab (\$997,692). This project is focused on integrating multiple phenotyping tools to understand the response of a *Setaria* RIL population to drought conditions induced in the field using rainout shelters.

**Predicting Drought Adaptation In C<sub>4</sub> plants With High Throughput Quantitative Phenotyping**. Brian Dilkes, PI. NSF EAGER. 09/01/2014-8/31/2016. (\$299,587) Baxter Lab (\$8000). This project is focused on testing the hypothesis that a combination of ionomics and isotope ratios in maize kernels contains signatures of drought adaptation.

**Genetic Enhancement of Soybean Seed Value by Biotechnology**. USDA-ARS intramural research project. This project is focused on using ionomics to identify genes and gene by environment interactions in soybean.

**An Integrated Phenomics Approach to Identifying the Genetic Basis for Maize Root Structure and Control of Plant Nutrient Relations**. Chris Topp, PI. NSF Plant Genome Research Program. 06/01/2016 – 05/31/2020. (\$440,872.62.) Baxter lab (\$34,550.45) This project is focused on using a multivariate approach to understanding root structure and function in response to different environments.

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## **PENDING PROPOSALS**

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### **PRIOR FUNDING**

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**GEPR: Mineral Nutrient Gene Discovery and Gene X Environment Interactions Using the Nested Association Mapping Population in Maize**, Ivan Baxter PI, NSF Plant Genome Research Program, 1/1/2012-12/31/2015 (\$1,387,118). Danforth Share (\$655,458). This project is focused on using ionomic profiling to identify genes and gene by environment interactions in maize.

**High throughput phenotyping for elemental accumulation QTL mapping of traits under supra-optimal temperatures and water-limited conditions**. 1/1/2013-12/31/2013 \$15,840 Cotton Inc.

**The National Association of Advanced Biofuels and Bioproducts (NAABB), Jose Olivares PI, Department of Energy**, 4/1/2010-3/31/2013 (\$44,036,473). Baxter Project: Ionomics: Investigation of Algal Nutrient Requirements (\$402,000).

**High throughput phenotyping for elemental accumulation QTL mapping of traits under supra-optimal temperatures and water-limited conditions**. 1/1/2014-12/31/2014 \$9,000 Cotton Inc.

## **4. LECTURES**

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### **INVITED SEMINARS**

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**2017**

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- (1) University of Arizona (2017)

**2016**

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- (1) Southern Illinois University at Edwardsville (2016) *What can the ionome tell us about how plants adapt to the environment?*
- (2) Iowa State University (2016) *Using elemental profiles to understand plant adaptation to the environment.*

**2015**

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- (3) Chinese Academy of Science, Shanghai, China (2015) *Location, location, location, and genetics! The ionome is a sensitive indicator of a plant's interaction with its environment.*
- (4) University of Missouri, Columbia, MO (2015) *Using the Ionome to understand Gene by Environment interactions in Soybean.*

**2014**

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- (5) University of Illinois, Urbana-Champaign, IL (2014) *Location, location, location, and genetics! The ionome is a sensitive indicator of a plant's interaction with its environment.*
- (6) University of Nottingham, Nottingham, England (2014) *Location, Location, Location, and Genetics! The Ionome is a Sensitive Indicator of a Plant's Interaction with Its Environment.*
- (7) Purdue Plant Sciences Lecture Series (2014) *Using High-Throughput Ionomics and Phenotyping to Study Gene by Environment Interactions.*
- (8) Washington University Science on Tap (2014) *It's Element-ary: Soil Composition and Genetic Effects on Plant Growth.*

**2013**

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- (9) UC Davis, Genetics Graduate Group seminar series on Genomics and Epigenetics (2013) *Location, Location, Location, and Genetics! The Ionome is a Sensitive Indicator of a Plant's Interaction with Its Environment.*
- (10) Washington State University Molecular Plant Sciences Graduate Program (2013) *Location, Location, Location, and Genetics! The Ionome is a Sensitive Indicator of a Plant's Interaction with Its Environment.*

**2012**

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- (11) University of Missouri, Columbia, Mo (2012) *G2Ionome: Linking the Genome with the Social Network of Elements.*
- (12) San Diego Center for Algal Biotechnology, San Diego, Ca (2012) *Surfing algal growth hyperspace: Exploring growth media space and optimizing genetics for biofuels applications.*

**2011**

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- (13) USDA-ARS Arid Land Agricultural Research Center, Maricopa AZ (2011) *G2Ionome: Linking the Genome with the Social Network of Elements.*
- (14) Saint Louis University, St. Louis, Mo (2011) *G2Ionome: Linking the Genome with the Social Network of Elements.*
- (15) Monsanto, St. Louis, Mo (2011) *What can the ionome tell us about how plants adapt to the*

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*environment? Lessons from Arabidopsis, Maize and Soybean.*

- (16) University of Missouri-St. Louis, St. Louis, Mo (2011) *What can the ionome tell us about how plants adapt to the environment? Lessons from Maize and Arabidopsis.*

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**2010**

- (17) Cornell University, Ithaca NY, (2010) *What can the ionome tell us about how plants adapt to the environment? Lessons from Maize and Arabidopsis.*
- (18) University of Arizona, Tucson, AZ (2010) *What can the ionome tell us about how plants adapt to the environment? Lessons from Maize, Arabidopsis and Yeast.*

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**2009**

- (19) Washington University, Saint Louis MO (2009) *How Plants Alter their Elemental Composition to Adapt to Different Soil Environments.*
- (20) University of Minnesota, St. Paul, MN (2009) *How Plants Alter their Elemental Composition to Adapt to Different Soil Environments.*
- (21) The Ohio State University, Columbus, OH (2009) *How Plants Alter their Elemental Composition to Adapt to Different Soil Environments.*
- (22) Danforth Plant Science Center, St. Louis, MO (2009) *How Plants Alter their Elemental Composition to Adapt to Different Soil Environments.*
- (23) USDA-ARS/ University of Missouri, Columbia, MO (2009) *How Plants Alter their Elemental Composition to Adapt to Different Soil Environments.*
- (24) University of Nebraska-Lincoln, Lincoln, NE (2009) *How Plants Alter their Elemental Composition to Adapt to Different Soil Environments.*
- (25) Iowa State University, Ames, IA (2009) *How Plants Alter their Elemental Composition to Adapt to Different Soil Environments.*

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**2008**

- (26) Dow AgroSciences, Indianapolis, IN (2008) *Mapping and Modeling the Arabidopsis Ionome.*
- (27) University of Massachusetts, Amherst, MA (2008) *Mapping and Modeling the Arabidopsis Ionome.*
- (28) Baylor College of Medicine, Houston, TX (2008) *Mapping and Modeling the Ionome in Yeast and Arabidopsis*
- (29) Danforth Plant Science Center, St. Louis, MO (2008) *Mapping and Modeling the Arabidopsis Ionome.*
- (30) Michigan State University, East Lansing, MI (2008) *Mapping and Modeling the Arabidopsis Ionome.*

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**2007**

- (31) Seminis Woodland, CA (2007) *Mapping and Modeling the Arabidopsis Ionome.*
- (32) Michigan State University, East Lansing, MI (2007) *Mapping and Modeling the Arabidopsis Ionome.*
- (33) Institute for Systems Biology, Seattle, WA (2007) *Mapping the Arabidopsis Ionome.*
- (34) Pioneer Hi-Bred, Johnston, IA (2007) *Mapping the Arabidopsis Ionome.*
- (35) Purdue University, Plant Biology Lecture Series, West Lafayette, IN (2007) *Linking Genetic Variation to Environmental Variation in the Arabidopsis Ionome.*

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**2006**

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- (36) Purdue University, Bioinformatics Seminar Series, West Lafayette, IN (2006) *From Genome*

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to Gene: Using an “-omic” Approach to Identify Causal Loci.

- (37) University of Nevada, Reno, NV (2006) *Array-Based Mapping, a Novel, Rapid Technique for Gene Identification: An Ionomics Case Study.*

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Invited Conferences (2005 to present)

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Upcoming

- (1) Genomic Science Principal Investigator Annual Meeting (February 2017). Arlington, VA.  
(2) Phenome 2017. Phoenix, AZ.

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2016

- (3) American Society of Agronomy, Crop Science Society of America, and Soil Science Society of America Annual Meeting, Phoenix, AZ (2016). *Ionomics of Micronutrients in Staple Crops; High-Throughput Phenotyping Approaches for Understanding Gene By Environment Interactions: Lessons Learned from Ionomics and Imaging.*  
(4) 5th International Controlled Environment Conference / AusPheno 2016, Canberra, Australia (2016)  
(5) Maize Genetics Conference, Jacksonville, FL (2016) *Elemental profiles are inherently the product of gene by environment interactions.*  
(6) Plant and Animal Genome XXIV, San Diego, CA (2016) *Using Elemental Profiling and Systems Biology to Identify Genes Underlying Toxic Element Uptake in Plants*  
(7) Corn Breeding Research Meeting, Jacksonville, FL (2016)  
(8) Rank Prize Fund Mini-Symposium on The Role of Crops in Providing Micronutrients (Fe, Zn, Se) for Human Health. Grasmere, England *Ionomics of Micronutrients in Staple Crops* (2016)  
(9) Danforth Plant Science Center, St. Louis, MO (2016) Collaborator Symposium. “*What elemental profiles tell us about how and where plants grow?*”

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2015

- (10) Florida International University, Miami, Florida (2015) *Ionomics and Genome-wide Association Studies.*  
(11) Department of Energy Genomic Sciences Grantees Meeting, Washington DC (2015) *High-throughput phenomic approaches to understanding drought adaptation in the C<sub>4</sub> model Setaria.*  
(12) International Workshop on Plant Ionomics and Nutrient Use Efficiency, Nanjing Agricultural University, China (2015) *Moving from ionomics GWAS to ionomics genes: comparative and network approaches.*  
(13) American Society of Plant Biologists, Minneapolis MN (2015) *Canopy Position Has a Profound Effect on Soybean Seed Composition*  
(14) Joint Danforth Center/Missouri Botanical Garden Symposium: From Darwin to Borlaug, Danforth Center, St. Louis, Mo (2015). *Location, Location, Location, and Genetics! Elemental profiles reveal insights into how crop plants adapt to their environment.*

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2014

- (15) American Chemical Society and Royal Society of Chemistry, Reno, NV (2014) *How integrating genetics with high throughput elemental profiling leads to knowledge about plant adaptation to the environment.*  
(16) Society for Experimental Biology, Manchester, England (2014) *Location, Location, Location,*

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*and Genetics! The Ionome is a Sensitive Indicator of a Plant's Interaction with Its Environment*

- (17) Plant and Animal Genome XXII, San Diego, CA (2014) *Drought Studies in Setaria using the Bellwether Foundation Phenotyping Facility at the Danforth Center.*

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**2013**

- (18) Plant and Animal Genome XXI, San Diego, CA (2013) *Maize Ionomics Identifies Gene by Environment Interactions Affecting Elemental Accumulation.*

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**2012**

- (19) ASA, CSSA, and SSA International Annual Meeting, Cincinnati, OH (2012) *Ionomics of Corn and Soybeans: Using High Throughput Elemental Profiling to Study How Plants Accumulate Minerals.*
- (20) IPG Symposium, Columbia, Mo (2012) *Using the Seed Ionome as an Indicator of Plant Physiological Properties.*
- (21) Maize Genetics Meeting, Portland, Oregon (2012) *Ionomics of the Maize Nested Association Mapping Population.*
- (22) Plant and Animal Genome XX, San Diego, Ca (2012) *Soybean Ionomics.*

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**2011**

- (23) Banbury Conference: Genomes to Phenomes, Cold Spring Harbor, NY (2011) *Ionomics.*
- (24) Danforth Symposium: Genomes to Phenomes, Danforth Center, St. Louis, MO (2011) *G2Ionome: Linking the Genome with the Social Network of Elements.*

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**2010**

- (25) American Society of Plant Biologists, Montreal, Quebec (2010) *Ionomics of the Maize Nested Association Mapping Panel.*
- (26) 12<sup>th</sup> International Association for Plant Biotechnology Congress, St. Louis, MO (2010) *Ionomics of the Maize Nested Association Mapping Panel.*

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**2009**

- (27) International Plant Molecular Biology Conference, St. Louis, MO (2009) *Combining Association Mapping with Ionomics to Identify Genes Important for Stress Tolerance.*
- (28) Danforth Symposium, St. Louis, MO (2009) *Yeast Ionomics: probing the effects of sub-cellular processes on elemental accumulation in a single celled organism.*

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**2007**

- (29) International Symposium on Metalomics, Nagoya, Japan (2007) *Mapping the Arabidopsis Ionome. Keynote lecture.*
- (30) ASPB Plant Biology 2007, Chicago, IL (2007) *Deletion and Duplication Detection in Arabidopsis Using Tiling Arrays.*
- (31) Plant Biology Symposium and Plant Proteomics Mini-Symposium, Columbia, MO (2007) *Ab initio Prediction of Protein Kinase Target Sites.*
- (32) Midwest Developmental Biology Meeting, Chicago, IL (2007) *Linking Genetic Variation to*

**2006**

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- (33) Pan American Plant Membrane Biology Workshop, South Padre Island, TX (2006) *DNA Microarray-Based Mapping, a Novel, Rapid Technique for Gene Identification: An Ionomics Case Study.*
- (34) ASPB Plant Biology 2006, Boston, MA (2006) *Natural Ionomic variation in Arabidopsis Identifies an E3 Ubiquitin Ligase Involved in Regulating Shoot Mo.*

**2005**

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- (35) ASPB Plant Biology 2005, Seattle, WA (2005) *A Plasma Membrane H<sup>+</sup>-ATPase is Required for the Formation of Proanthocyanidins in the Seed Coat Endothelium of Arabidopsis thaliana.*
- (36) International Conference on Arabidopsis Research, Madison, WI (2005) *Mapping the Arabidopsis Ionome.*

## 5. SERVICE

### SERVICE TO THE SCIENTIFIC COMMUNITY

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#### *Editorial and Journal Review*

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**Manuscript Reviews***Journal of Plant Nutrition and Soil Science* – 1*Plant Physiology* – 17*The Plant Journal and Plant Cell* – 4*The Plant Genome* – 1*PloS Genetics* – 3*New Phytologist, Rice, Physiologia Planarium, Theoretical and Applied Genetics and Crop Science* – 1*Plant Physiology and Biochemistry* – 1**Editor**

PLOS ONE academic editor since 2006

PLOS ONE Plant Biology section editor since 2008

#### *Chair and Member of Workshops*

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Session Chair: ASPB Plant Biology 2007

American Society of Plant Biologist Lab Leadership Workshop 2006

Co-Chair: iPlant Mineral Nutrition Working Group 2010-2012

#### *Grant Panelist and Reviewer*

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Grant Panelist – NSF panels 2013 and 2015 (2)

Grant Reviewer, 10 NSF grants 2010-2015

Grant Reviewer, 2 USDA grants 2015

### SERVICE TO THE USDA-ARS

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Organizer: USDA-ARS Big Data Genetics of Populations Workshop 2015

Writing team: Big Data and Computing Building a Vision for ARS Information 2013

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**Management**

Writing team: USDA-ARS National Program 301 Action Plan	2012
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**SERVICE TO THE DONALD DANFORTH PLANT SCIENCE CENTER**

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*Oversight or Regular Committee Member*

Scientific Co-Organizer, Danforth Center Symposium: Macro-Influence of Microorganisms: Host-Microbe Interactions and Inspired Technologies	2014
Scientific Co-Organizer, Danforth Center Symposium: PhenoDays: Imaging and Robotics for 21st Century Science	2013
Chair: Danforth Center Responsible Conduct of Research Training Committee	2013-present
Danforth Center eLab Notebook Committee	2012-present
Danforth Center Bioinformatics Core Oversight Committee	2012-present
Bellwether Phenotyping Facility Design and Oversight Committee	2011-present
Danforth Center Proteomics and Mass-Spec Core Oversight Committee	2010-2012
Scientific Co-Organizer, Danforth Center Symposium: Genomes to Phenomes	2011
Danforth Center Institutional Equipment Fund Committee	2009-present
Co-Chair: Danforth Center Responsible Conduct of Research Training Committee	2009-present
Advisor: Danforth Center Future PIs peer mentoring group	Present

*Graduate and Undergraduate Awards and Honors*

Deep Gene Travel Award (ASPB Plant Biology 2003)	2003
American Society of Plant Biologists Travel Award Recipient	2002
Biochemistry Lab Teaching Assistant, MIT	1997
Freshman Chemistry, Head Teaching Assistant, MIT	1996
Phi Beta Kappa	1996
President, Student Government Association, Goucher College	1995-1996
Claasen Chemistry Scholar, Goucher College	1993-1996
Dean's List, Goucher College	1993-1996
Dean's Scholarship Recipient, Goucher College	1992-1996

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**MENTORING and OUTREACH ACTIVITIES**

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*Lecturer, Courses and Workshops***Washington University**

Saint Louis, Missouri

DBBS Ethics Course, Instructor	Spring 2014 6 sessions
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Bio 4028, Lecturer, 2 lectures	2010
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2 lectures	2011
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Bio527 Journal Club	2011, 2012
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Bio527 Journal Club Organizer	Fall 2013
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Guest Lecturer:

**University of Missouri**

Columbia, Missouri

Guest Lecturer, PS8530	2011-2015
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High School Teacher workshops:

St. Louis, Missouri

January 2013
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Outreach Activities


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St. Louis County Science Fair Judge 2015, 2016

Mentoring, Postdoctoral Scientists, Graduate, Undergraduate and Other

Max Feldman, Postdoctoral Scientist	01/02/13-present
Catherine Ziyomo, Postdoctoral Scientist	10/3/12-
1/3/14	
Aimee Terauchi, Postdoctoral Scientist	10/26/10-2/8/13
Alexandra Asaro, Washington University, Saint Louis Graduate Student	1/7/14-present
Molly Wohl, Programmer	11/7/14-present
Ryan Hartwig, Programmer	11/7/14-12/31/15
Melissa Jurkowski, Technician	11/25/13-present
Kim Green, Technician	9/24/12-present
Jennifer Hard, Technician	12/6/10-present
Greg Ziegler, Technician	11/22/10-present
<i>Ph. D in 4/2014. Thesis was written exclusively on work done in Baxter lab.</i>	
Janna Hutchinson, Technician	11/28/11-present
Walter Iverson, Technician	3/10-8/11
Evan Kesinger, Undergraduate Student	5/27/14-8/1/14
Joe (Nathan) Lindsey, Undergraduate Student	5/27/14-8/1/14
Derrick Smith, Undergraduate Student	5/20/13-8/2/13
Elise Viox, Undergraduate Student	12/19/13-1/3/14
	5/20/13-8/2/13
	6/8/10-7/16/10
Stephanie Grenada, Undergraduate Student	5/20/13-8/2/13
Anthony Becker, Undergraduate Student	5/24/10-8/30/11
	5/9/12-7/19/12
	5/24/10-8/30/11
Bruce Green, Undergraduate Student	5/29/12-8/10/12
Paul Smelcer, Undergraduate Student	2011
Anne Kearney, Undergraduate Student	5/23/11-8/5/11
Adaisia Stevens, High School Student	6/11/12-7/20/12
Jailin Ding, High School Student	6/1/14-9/1/14
	5/28/13-9/1/13
Rebecca Rodell, High School Student	6/1/15-9/1/15
	6/1/14-9/1/14
	6/12/13-9/1/15
Rebecca Valle, Intern	6/1/15-9/1/15
Elizabeth Mahood, Intern/Undergrad	6/1/15-Present
Jacob Roth, Intern	5/23/16 - Present
Maddie Schuler, Summer Lab Assistant	Summer 2016
Omkar Venkatesh, Intern	Summer 2016

Trainee Talks: Max Feldman2016


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Multiscale Plant Vascular Biology - Gordon Research Conference, Sunday River, ME. *Time*



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*Dependent Genetic Analysis Links Field and Controlled Environment Phenotypes in the Model C<sub>4</sub> Grass Setaria*

2015

Washington University Plant and Microbial Biosciences Annual Retreat, Tyson Research Center at Washington University, St. Louis, MO. *Setaria Travels into the 4th Dimension: The Genetic Architecture of Plant Height.*

ASPB Midwest Sectional Meeting, Donald Danforth Plant Science Center, St. Louis, MO. *High-throughput Phenomics Approaches to Understanding Drought Adaptation in the C<sub>4</sub> model grass Setaria.*

2014

Donald Danforth Plant Science Center Annual Retreat, Pere Marquette Lodge & Conference Center, Grafton, IL. *Aggregating Quantitative Phenotypes to Delineate the Genetic Architecture of Drought Tolerance in Setaria.*

Alexandra Asaro

2015

American Society of Plant Biologists, Minneapolis MN *Gene by Environment Interaction in the Maize Ionome*