Timothy M. Beissinger

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Education

The University of Wisconsin at Madison, Madison, Wisconsin USA
- Ph.D., **Statistical and Quantitative Genetics** 2014
  - Advisors: Natalia de Leon and Daniel Gianola
- M.S., **Statistics** 2011
- B.S., **Mathematics and Geography** 2009

Current Appointments

Research Geneticist 2015 - Present
- USDA-ARS, Plant Genetics Research Unit
- University of Missouri, Columbia

Adjunct Assistant Professor University of Missouri, Columbia
- Division of Plant Sciences 2015 - Present
- Division of Biological Sciences 2016 - Present

Previous Appointments

Postdoctoral Research Associate 2014 - 2015
- Mentored by Professor Jeff Ross-Ibarra
  - Department of Plant Sciences
  - University of California, Davis

Visiting Scientist 2014
- Mentored by Professor Henner Simianer
  - Department of Animal Breeding and Genetics
  - Georg-August Universität, Göttingen, Germany

Research Assistant 2009 - 2014
- Department of Agronomy
- University of Wisconsin, Madison

Advising

Direct advisees
- PostDoc (starting Aug 1, 2017; NSF PGRP Fellowship) (1)
- PhD Student, Division of Biological Sciences (1)
- Undergraduate students (2)

PhD Committees
- Division of Animal Sciences (1)
- Division of Biological Sciences (1)
- Division of Plant Sciences (1)

MSc Committees
- Division of Animal Sciences (1)

Preprints

Wang, L., **Beissinger, T.M.**, Lorant, A., Ross-Ibarra, C., Ross-Ibarra, J., Hufford, M. 2017. The interplay of demography and selection during maize domestication and expansion. Bioarxiv. http://biorxiv.org/content/early/2017/03/07/114579

Publications

Beissinger, T.M., Morota, G. 2017. Medical subject heading (MeSH) annotations illuminate maize genetics and evolution. Plant Methods. 13(8). DOI: 10.1186/s13007-017-0159-5.

Morota, G., **Beissinger, T.M.**, Peñagaricano, F. 2016. MeSH annotation of the chicken genome: MeSH-informed enrichment analysis and MeSH-guided semantic similarity among functional terms and gene products. Genes Genomes Genetics. DOI: 10.1534/g3.116.031096.

Beissinger, T.M., Wang, L., Crosby, C., Durvasula, A., Hufford, M.B., Ross-Ibarra, J. 2017. Recent demography drives changes in linked selection across the maize genome. Nature Plants. 2(16084). DOI:10.1038/nplants.2016.84.

Beissinger, T.M., Gholami, M., Erbe, M., Weigend, S., Weigend, A., de Leon, N., Gianola, D., Simianer, H. 2015. Using the variability of linkage disequilibrium between subpopulations to scan for selection in a diverse panel of chickens. Heredity. DOI: 10.1038/hdy.2015.81.

Haase, N.J., **Beissinger, T.M.**, Hirsch, C.N., Vaillancourt, B., Deshpande, S., Barry, K., Buell, C.R., Kaeppler, S., de Leon, N. 2015. Genetic Dissection of quantitative traits using a bulked segregant analysis (BSA)-sequencing method on a large segregating population of maize. Genes Genomes Genetics. DOI: 10.1534/g3.115.017665.

Beissinger, T.M., Rosa, J.G.M., Kaeppler, S.M., de Leon, N., Gianola, D. 2015. Defining window-boundaries for genomic analyses using smoothing spline techniques. Genetics Selection Evolution. 47(30). DOI: 10.1186/s12711-015-0105-9.

Lorenz, A. J., **Beissinger, T.M.**, Rodrigues, R., de Leon, N. 2015. Selection for silage yield and composition did not affect genomic diversity within the Wisconsin Quality Synthetic maize population. Genes Genomes Genetics. DOI: 10.1534/g3.114.015263.

Foerster, J.M., **Beissinger, T.M.**, de Leon, N., Kaeppler, S.M. 2015. Large effect QTL explain natural phenotypic variation for the developmental timing of vegetative phase change in maize (*Zea mays L.*). Theoretical and Applied Genetics. DOI: 10.1007/s00122-014-2451-3.

Hirsch, C.N., Flint-Garcia, S.A., **Beissinger, T.M.**, Eichten, S.R., Deshpande, S., Barry, K., McMullen, M.D., Holland, J.B., Buckler, E.S., Springer, N.M., Buell, C.R., de Leon, N., Kappler, S.M. 2014. Insights into the effects of long-term artificial selection on seed size in maize. Genetics. 198(1): 409-421.

Beissinger, T.M., Hirsch, C.N., Vaillancourt, B., Deshpande, S., Barry, K., Buell, C. R., Kaeppler, S. M., Gianola, D., de Leon, N. 2014. A genome-wide scan for evidence of selection in a maize population under long-term artificial selection for ear number. Genetics. 196(3): 829-840.

*__Beissinger, T.M.__, Hirsch, C.N., Sekhon, R.S., Foerster, J.M., Johnson, J.M., Muttoni, G., Vaillancourt, B., Buell, C.R., Kaeppler, S.M., de Leon, N. 2013. Marker density and read-depth for genotyping populations using genotyping-by-sequencing. Genetics. 193: 1073-1081.
* Selected as a highlighted article by the editorial board.

Wu, X., Chuanyu, S., **Beissinger, T.M.**, Rosa, G., Weigel, K., de Leon, N., Gianola, D. 2012. Parallel Markov chain Monte Carlo - bridging the gap to high performance Bayesian computation in animal breeding and genetics. Genet Sel Evol. 44:29.

Wu, X., **Beissinger, T.M.**, Bauck, S., Woodward, B., Rosa, G., Weigel, K., de Leon, N., Gianola, D. 2011. A primer on high-throughput computing for genomic selection. Frontiers in Genetics. 2, 4.

Software

GenWin: Spline Based Window Boundaries for Genomic Analyses
An R package for analyzing genetic data across distinct bins.
http://cran.r-project.org/web/packages/GenWin/index.html

Grants and Funding

2015-Present, USDA-ARS Project Number 3622-21000-034-00D. Revolving funds. Budget supports a technician, student employees, supplies, equipment, and space.

2012, University of Wisconsin Graduate School. Awarded one year of funding and supplies to support dissertation research.

2012, DuPont-Pioneer and UW Associated Students of Madison. Funding supported the first University of Wisconsin Pioneer Plant Sciences Symposium.

2011, DuPont-Pioneer. Awarded funding to genotyping 240 samples with the Pioneer Public SNP array.

Teaching

Co-instructor

Genetics of Populations — Fall 2016
University of Missouri, Division of Animal Sciences

Systems Biology Reading Group — Spring 2016
University of Missouri, Division of Biological Sciences

Intoduction to Linux and High Throughput Computing — Fall 2010
University of Wisconsin, Madison Department of Animal Sciences

Guest Lectures

Advanced Plant Genetics — December 2016
Lecture on Plant Population Genetics, MU Division of Biological Sciences

Applied Quantitative and Statistical Genetics — December 2015
Two lectures on Genomic Prediction, MU Division of Plant Sciences

Teaching assistant

Biometrical Procedures in Plant Breeding — Fall 2011, 2013
University of Wisconsin, Madison Department of Agronomy

Experimental Design — Spring 2013
University of Wisconsin, Madison Department of Agronomy

Advanced Plant Breeding — Spring 2012
University of Wisconsin, Madison Department of Agronomy

Tutoring

Statistics — Fall 2010 - Spring 2011
Advanced Placement Statistics

Calculus — Fall 2006- Spring 2007
Advanced Placement Calculus AB

Invited Presentations (last 3 years)

Asian Crop Science Association Conference
Jeju, South Korea

June, 2017

Department of Ecology and Evolutionary Biology
University of Oregon
May, 2017

Department of Ecology and Evolutionary Biology
University of Kansas
March, 2017

Department of Plant Breeding and Genetics
Cornell University
February, 2017

Pioneer Hi-Bred
Ankeny, Iowa
February, 2017

Advances in Plant Breeding Workshop
CiBreed, Georg-August-Universität, Göttingen, Germany
January, 2017

Seminar for Evolution, Ecology, and Population Biology Program
Washington University in St. Louis, Missouri
November, 2016

Department of Crop Sciences
University of Illinois
October, 2016

Division of Biological Sciences
University of Missouri, Columbia
October, 2016

Department of Crop Sciences, Chungnam National University
Deajeon, South Korea.
July, 2016

KWS Seed Company
Einbeck, Germany
April, 2016

Advanced Seminar for Statistical Genetics
Department of Animal Breeding and Genetics, Georg-August Universitat,
Göttingen, Germany
April 2016

Corn Breeding Research Meeting
Jacksonville, FL
March 2016

Maize workshop
Plant and Animal Genome Conference 24, San Diego, CA
January, 2016

Division of Plant Sciences, University of Missouri
Columbia, Missouri
November, 2015

Department of Botany and Plant Sciences
University of California, Riverside
April, 2015

USDA-ARS Plant Genetics Research Unit
University of Missouri
March, 2015

Beissinger, T., Wang, L., Durvasula, A., Crosby, K., Hufford, M., and Ross-Ibarra, J. 57th annual Maize Genetics Conference, St. Charles, IL
March, 2015

Genomic selection and genome-wide association studies workshop
Plant and Animal Genome Conference 23, San Diego, CA
January 2015

Bay Area Population Genomics Meeting XI
University of California, Davis
December, 2014.

Department of Animal Science
University of California, Davis
August, 2014

Department of Animal Breeding and Genetics,
Georg-August Universitat, Göttingen, Germany
February 2014

Center of Life and Food Sciences
Technische Universitat Munchen
April 2014

Poster Abstracts

Beissinger, T., Kruppa, J., Simianer, H. Gordon Conference in Quantitative Genetics. Galveston, TX, Feb 2017.

Beissinger, T., Kruppa, J., Lorenz, L., Simianer, H. 5th International Conference on Quantitative Genetics. Madison, WI, June 12-17, 2016.

Beissinger, T. and Ross Ibarra, J. Plant and Animal Genome Conference 23. San Diego, CA, January 10-14, 2015.

Beissinger, T., Gianola, D., de Leon, N. Impact of Large-Scale Genomic Data on Statistical and Quantitative Genetics Conference. Seattle, WA, November 23-26, 2013.

Beissinger, T., Hirsch, C., Vaillancourt, B., Buell, R.C., Kaeppler, S., Gianola, D., de Leon, N. Maize Genetics Conference. St. Charles, Il, March 14-17, 2013.

Beissinger, T., Hirsch, C., Buell, R.C., Kaeppler, S., Gianola, D., de Leon, N. Gordon Research Seminar in Quantitative Genetics and Genomics. Galveston, TX, February 16-17, 2013.

Beissinger, T., Hansey, C., Foerster, J., Sekhon, R., Johnson, J., Muttoni, G., Vaillancourt, B., Buell, C.R., Kaeppler, S., de Leon, N. Maize Genetics Conference. Portland, OR, March 15-18, 2012.

Beissinger, T., de Leon, N., Kaeppler, S. Maize Genetics Conference. St Charles, IL, March 17-20, 2011.

Academic and Professional Service

MU Informatics Institute
Core faculty member — 2016 - Present

Faculty advisor for student-organized MU Plant Sciences Symposium
Building the Bridge from Fundamental Research to Improving Tomorrows Crops
Funded by Pioneer Hi-Bred — 2016 - Present

"Detox" Evolutionary Genetics Discussion Group
Faculty organizer and host of extracurricular journal club — Fall 2015 - Present

Journals reviews

Nature
Nature Genetics
Genetics
BMC Evolutionary Biology
PLoS Computational Biology
BMC Genomics Crop Science
Genes Genomes Genetics (G3)
Heredity
PeerJ
The Plant Genome
Theoretical and Applied Genetics
Crop Science

Ad-hoc grant reviews
USDA-NIFA, Plant Breeding for Agricultural Production
University of Missouri Research Board

Awards and Scholarships

USDA Group Platinum Hall of Fame — 2016
For contributions to Feds Feed Families Campaign

Monsanto fellowship recipient — 2009-2014

Scholarship to attend Summer Institute in Statistical Genetics — 2012
University of Washington, Seattle

Scholarship to attend TeraGrid Conference — 2010
Pittsburgh, PA

Scholarship to attend Open Science Grid Summer School — 2010
Madison, WI

Undergraduate deans list — All semesters 2007-2009

Susan B. Hotchkiss memorial scholarship — 2005

Academic and Professional Development

Monsanto Fellows Professional Development Program — September 2012
17th Summer Institute in Statistical Genetics — July 2012
Monsanto Fellows Professional Development Program — September 2011

	Monsanto Fellows Professional Development Program	September 2010
	Monsanto Fellows Professional Development Program	September 2009
	University of Wisconsin Plant Breeding Internship	Summer 2008
Computing Expertise	R, Linux/Unix, SAS, Latex, Condor, Java, Perl, Python	
	Linux workstation system administrator	2010 - 2014
	Participated in Open Science Grid Summer School	July 2010
Statistical Expertise	Bayesian analysis, estimation of functions from data, mixed models, mathematical statistics, statistical inference, linear regression and analysis of variance	
Mathematical Expertise	Real and complex analysis, combinatorics, topology, number theory, modern algebra, cellular automata	