Timothy M. Beissinger

CONTACT INFORMATION

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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 Jan - Apr 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

EDUCATION

The University of Wisconsin at Madison, Madison, Wisconsin USA

Ph.D., **Statistical and Quantitative Genetics** May 2014
Departments: Agronomy and Animal Science
Advisors: Professors Natalia de Leon and Daniel Gianola

M.S., **Statistics** May 2011

B.S., **Mathematics and Geography** May 2009

PUBLICATIONS

Beissinger, T.M., Morota, G. 2017. Medical subject heading (MeSH) annotations illuminate maize genetics and evolution. Plant Methods. *in press*. `http://biorxiv.org/content/early/2016/07/13/048132`

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. 2015. 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

Conference, Webinar, and Departmental Presentations

Beissinger, T. Pioneer Hi-Bred
February, 2017

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

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

Beissinger, T. Department of Crop Sciences,
University of Illinois
October, 2016

Beissinger, T. Division of Biological Sciences
University of Missouri, Columbia
October, 2016

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

Beissinger, T. KWS Seed Company
Einbeck, Germany
April, 2016

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

Beissinger, T. Corn Breeding Research Meeting, Jacksonville, FL
March 2016

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

Beissinger, T. Division of Plant Sciences, University of Missouri
Columbia, Missouri
November, 2015

Beissinger, T. Department of Botany and Plant Sciences, University of California
Riverside, CA
April, 2015

Beissinger, T. USDA-ARS Plant Genetics Research Unit, University of Missouri
Columbia, 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

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

Beissinger, T. Bay Area Population Genomics Meeting XI. Davis, CA,
December, 2014.

Beissinger, T. Department of Animal Science, University of California, Davis
August, 2014

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

Beissinger, T. Center of Life and Food Sciences, Technische Universitat Munchen, Munich, Germany
April 2014

Beissinger, T. Animal Science Department, University of Nebraska, Lincoln
December, 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, 2013.

Beissinger, T. Corn Breeding Webinar Series, hosted by Dr. Rex Bernardo at the University of Minnesota. December, 2012.

Beissinger, T., Hansey, C., Sekhon, R., Vaillancourt, B., Buell, C.R., Kaeppler, S., de Leon, N. North Central Regional Corn Breeding Research Meeting. Portland, OR, March, 2012.

Poster Abstracts

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 — February 2017

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

Journals reviews

Nature
Nature 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

PhD Committees
Division of Animal Sciences (2)
Division of Biological Sciences
Division of Plant Sciences

Awards and Scholarships

USDA Group Platinum Hall of Fame For contributions to Feds Feed Families Campaign	2016
Monsanto fellowship recipient	2009-2014
Scholarship to attend Summer Institute in Statistical Genetics University of Washington, Seattle	2012
Scholarship to attend TeraGrid Conference Pittsburgh, PA	2010
Scholarship to attend Open Science Grid Summer School Madison, WI	2010
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