

Timothy M. Beissinger

CONTACT INFORMATION	Carl-Sprengel-Weg 1 Georg-August-Universität 37075 Göttingen, Germany	+49 551 3924369 beissinger@gwdg.de http://uni-goettingen.de/plantbreeding
EDUCATION	The University of Wisconsin at Madison , Madison, Wisconsin USA Ph.D., Statistical and Quantitative Genetics Advisors: Natalia de Leon and Daniel Gianola M.S., Statistics B.S., Mathematics and Geography	2014 2011 2009
CURRENT APPOINTMENTS	Professor and Chair, Plant Breeding Methodology Division of Plant Breeding Methodology Center for Integrated Breeding Research (CiBreed) Georg-August-Universität, Göttingen	2018 - Present
PREVIOUS APPOINTMENTS	Research Geneticist USDA-ARS, Plant Genetics Research Unit University of Missouri, Columbia Adjunct Assistant Professor University of Missouri, Columbia Division of Plant Sciences Division of Biological Sciences Postdoctoral Research Associate Mentored by Professor Jeff Ross-Ibarra Department of Plant Sciences University of California, Davis Visiting Scientist Mentored by Professor Henner Simianer Department of Animal Breeding and Genetics Georg-August Universität, Göttingen, Germany Research Assistant Department of Agronomy University of Wisconsin, Madison	2015 - 2018 2015 - 2018 2014 - 2015 2014 2009 - 2014
PUBLICATIONS	Gyawali, A. , Shrestha, V., Guill, K.E. , Flint-Garcia, S., and Beissinger, T.M. , 2019. Single Plants GWAS coupled with bulk segregant analysis Allows rapid identification and plant-height candidate SNPs, BMC Plant Biology. In Press. Sekhon, RS, Saski, C., Kumar, R., Flinn, B., Luo, F., Beissinger, T.M. , Ackerman, A.J., Breitzman, M.W., Bridges, W.C., de Leon, N., Kaeppler, S.M., 2019. Integrated genome-scale analysis identifies novel genes and networks underlying senescence in maize. The Plant Cell, DOI: https://doi.org/10.1105/tpc.18.00930 . Petrowski, P.F. , King, E.G. , Beissinger, T.M. 2019. An R Framework for the Partitioning of Linkage Disequilibrium between and Within Populations. Journal of Open Research Software. DOI: http://doi.org/10.5334/jors.250 .	

***Beissinger, T.M.**, Kruppa, J., Cavero, D., Ha, N., Erbe, M., Simianer, H. 2018. A simple test identifies selection on complex traits. *Genetics*. 209(1). DOI: 10.1534/genetics.118.300857.

***Selected as a highlighted article of the issue and subsequently as a 2018 *Spotlight* article indicating it stood out as one of the most impactful Genetics articles of the year.**

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. *Genome Biology*. <https://doi.org/10.1186/s13059-017-1346-4>

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., Kaeppler, 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.

PREPRINTS

Turner-Hissong, S., Mabry, M., **Beissinger, T.M.**, Ross-Ibarra, J., Pires, J. Evolutionary insights into plant breeding. *AgriXiv Preprint*: <https://agrixiv.org/akdt8>

Bird, K., **Beissinger, T.M.**, Angelovici, R.A., Subset-based genomic prediction provides insights into the genetic architecture of free amino acid levels in dry *Arabidopsis thaliana* seeds. <https://www.biorxiv.org/content/10.1101/272047v1.abstract>

SOFTWARE

Ghat: Quantifying Evolution and Selection on Complex Traits

An R package to test for selection on measured phenotypes, using whole-genome marker data.

<https://cran.r-project.org/web/packages/Ghat/index.html>

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>

ohtastats: Tomoko Ohta's D Statistics

An R package to Calculate Tomoka Ohta's partitioning of linkage disequilibrium between and within populations.

<https://cran.r-project.org/web/packages/ohtadstats/index.html>

GRANTS AND FUNDING

2018, USDA-NIFA AFRI award Title: Leveraging Genomic Prediction And Exploiting Exotic Alleles For Maize Nutritional Quality. Award of approximately \$500,000 USD was declined due to professional relocation to Germany.

2017, Midwest Big Data Spoke Project. Seed grant to develop an online QTL database for maize. Initial source of funds was NSF.

2015-2018, USDA-ARS. Project Number 3622-21000-034-00D. Revolving funds. Budget supported 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

Instructor

Selection Theory Spring/Summer 2019
University of Göttingen, Interdisciplinary Plant and Animal Breeding

Co-instructor

Population and Quantitative Genetics Fall/Winter 2018 - 2019
University of Göttingen, Interdisciplinary Plant and Animal Breeding
Genome Analysis and Application of Markers in Plant Breeding Fall/Winter 2019
University of Göttingen, Division of Plant Breeding
Breeding Schemes Spring/Summer 2019
University of Göttingen, Interdisciplinary Plant and Animal Breeding
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
Introduction 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](#)

DIRECT

SUPERVISING & ADVISING

Current

Senior scientists: 2
Lecturers: 2
PostDocs: 2
PhD Students: 2
PhD examination committees: 4
Technicians: 1
Administrative personnel: 2

Previous

Senior scientists: 1
Postdocs: 2
PhD Students: 2
PhD examination committees: 8
Masters students and committees: 2

	Technicians: 1	
ACADEMIC AND PROFESSIONAL SERVICE	Center for Integrated Plant and Animal Breeding (CiBREED) Executive board member	2019 - 2018
	MU Informatics Institute Core faculty member	2016 - 2018
	Editorial Boards Associate Editor, <i>Crop Science</i>	term runs 2018 - 2021
	Conference and Workshop Organizing Chair of Predictive Breeding Session at <i>GPZ 2020 Digital Breeding Meeting</i>	2020
	Organizer of 2019 CiBREED Workshop	2019
	Faculty advisor for student-organized MU Plant Sciences Symposium Funded by Pioneer Hi-Bred	2016 - 2018
	“Detox” Evolutionary Genetics Discussion Group Faculty organizer and host of extracurricular journal club	Fall 2015 - Present
	Journal reviews Nature Nature Genetics Genetics BMC Evolutionary Biology PLOS Computational Biology PLOS Biology BMC Genomics	Genes Genomes Genetics (G3) Heredity PeerJ The Plant Genome Theoretical and Applied Genetics Crop Science Plants
	Ad-hoc grant and accreditation reviews University of Illinois GWAS Accreditation for universities in developing countries	2017, 2019
	USDA-NIFA, Plant Breeding for Agricultural Production University of Missouri Research Board	
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
INVITED PRESENTATIONS (LAST 3 YEARS)	Julius Kühn Institute (JKI)	

Quedlingburg, Germany
October, 2019

University of Giessen
Giessen, Germany
June, 2019

Leibniz Institute for Plant Genetics (IPK)
Gatersleben, Germany
May, 2019

CiBREED Kick-off Conference: Plants and Animals – Bridging the Gap in Breeding
Research
University of Göttingen
Göttingen, Germany
October, 2018
[Link to video of talk](#)

Seoul National University
Seoul, South Korea
June, 2017

Asian Crop Science Association Conference
Jeju, South Korea
June, 2017

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

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

Danforth Center for Plant Science
St. Louis, Missouri, USA
March, 2017

Department of Plant Breeding and Genetics
Cornell University, USA
February, 2017

Pioneer Hi-Bred
Ankeny, Iowa, USA
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, USA
November, 2016

Department of Crop Sciences
University of Illinois, USA
October, 2016

Division of Biological Sciences
University of Missouri, Columbia, USA
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, USA
March 2016

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