

HARLY DURBIN

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4100 State Road J
Fulton, MO 65251

EDUCATION

PhD, Genetics Area Program

University of Missouri
Columbia, MO

August 2016 - December 2020

B.S., Animal Science

Texas A&M University
College Station, TX

August 2012 - August 2016

College of Agriculture and Life Sciences Reciprocal Exchange

University College Dublin
Dublin, Ireland

January 2015 - May 2015

Github: harlydurbin

Twitter: @harlyjaned

LinkedIn: hjdurbin



RESEARCH EXPERIENCE

Graduate Research Assistant

University of Missouri

Major Advisor: Dr. Jared Decker

August 2016 - December 2020

- Coordination and management of the Mizzou Hair Shedding Project, a 4-year research effort involving > 13,000 beef cattle in 77 herds across the United States and multiple beef cattle breed associations
- Created workflows for genotype calling and QC from publicly sourced whole genome sequence data using GATK
- Generated genomic predictions using a large data set of microarray SNP genotypes, environmental data, and "citizen science" sourced phenotypes

Angus Genetics, Inc. Intern

American Angus Association

Supervisor: Dr. Stephen Miller

May 2019 - September 2019

- Used > 10 million measurements collected by Angus breeders between 1973 and 2019 to generate estimates of genotype-by-environment interaction effect on beef cattle growth & create environment-aware breeding values
- Worked with research, IT, marketing, and information systems teams to design and implement a national genetic evaluation for hair shedding, released to Association members in February 2020
- Delivered findings to stakeholders at the annual AGI board meeting in College Station, TX

TECHNICAL SKILLS

Programming languages: R including the "tidyverse" package suite, Python, Perl, SAS, SQL

Applications: PLINK, GATK/Picard, SnpEff/SnpSift, VCFtools, BCFtools, BEDtools, EIGENSOFT, GEMMA, fastSTRUCTURE, GCTA, BLUPF90 suite, SNP1101

Other selected skills: Workflow management with Snakemake, version control with Git, reproducible project documentation with RStudio and R Markdown, comfortable working in an HPC environment

HONORS & AWARDS

2020

ICQG6 US-Based Early Career Researcher Scholarship (\$250)
Neal A. Jorgensen Bioinformatics Travel Award, Plant and Animal
Genome XXVII Conference (\$1,000)

PUBLICATIONS

2020

Durbin HJ, Lu D, Yampara-Iquise H, Miller SP, Decker JE.
Development of a genetic evaluation for hair shedding in American
Angus cattle to improve thermotolerance. Genetics, Selection,
Evolution. <https://doi.org/10.1186/s12711-020-00584-0>

Durbin HJ, Miller SP, Decker JE. Evidence for genotype-by-
environment interactions across discrete ecoregions in American
Angus cattle. In preparation.

Rowan TN, **Durbin HJ**, Seabury CM, Schnabel RD, Decker JE.
Powerful detection of polygenic selection and environmental
adaptation in US beef cattle populations. In review at PLOS
Genetics. <https://doi.org/10.1101/2020.03.11.988121> (bioRxiv)

Keith MH, **Durbin HJ**, Rowan TN, Blomquist GE, Flinn MV, Taylor KH,
Taylor JF, Decker JE. Genetic ancestry and population structure of a
rural Caribbean community. In review at PLOS Genetics.

Whitacre LK, **Durbin HJ**, Rowan TN, Wildhaber ML, Johnson GS,
Schnabel RD, Downs JM, Mhlanga-Mutangadura T, Tabor VM,
Fenner D, Decker JE. Exploring genetic variation and population
structure in a threatened species, *Noturus placidus*, with whole
genome sequence data. In preparation.

Arisman BC, Rowan TN, Thomas JM, **Durbin HJ**, Patterson DJ,
Decker JE. Evaluation of Zoetis GeneMax Advantage genomic
predictions in commercial *Bos taurus* Angus cattle. In review at
Livestock Science. <https://doi.org/10.1101/2020.10.23.353144>
(bioRxiv)

INVITED & CONTRIBUTED PRESENTATIONS

2020

Durbin HJ, Rowan TN, Decker JE, Miller SP. Leveraging genotype by
environment interactions across discrete climate regions to select
more sustainable beef cattle (2020). International Conference of
Quantitative Genetics 6 (Oral Presentation)

INVITED & CONTRIBUTED PRESENTATIONS

2020

Durbin HJ, Rowan TN, Decker JE, Miller SP. Leveraging genotype by environment interactions across discrete climate regions to select more sustainable beef cattle (2020). Plant and Animal Genomes Population & Conservation Genomics Workshop (Oral Presentation)

Durbin HJ, Rowan TN, Decker JE, Miller SP. Leveraging genotype by environment interactions across discrete climate regions to select more sustainable beef cattle (2020). Plant and Animal Genomes NRSP8 Workshop (Oral Presentation)

2019

Durbin HJ, Yampara-Iquise H, Schnabel RD, Decker JE. Using citizen science to identify cattle for a changing climate (2019). CSHL Biology of Genomes Conference (Poster Presentation)

Durbin HJ, Yampara-Iquise H, Schnabel RD, Decker JE. Using citizen science to identify cattle for a changing climate (2019). MU Animal Sciences Graduate Research Forum (Poster Presentation)

2018

Durbin HJ, Yampara-Iquise H, Schnabel RD, Decker JE. Impact of early summer hair shedding on susceptibility to fescue toxicosis and heat stress in taurine cattle (2018). Genetics Society of America Population, Evolutionary and Quantitative Genetics Conference (Poster Presentation)

Durbin HJ, Yampara-Iquise H, Schnabel RD, Decker JE. Impact of early summer hair shedding on susceptibility to fescue toxicosis and heat stress in taurine cattle (2018). Missouri Life Sciences Week, University of Missouri (Poster Presentation)

2017

Durbin HJ, Rowan TN, Taylor JF, Schnabel RD, Gower G, Llamas B, Cooper A, Decker JE. Delineation of cattle demographic history using whole genome sequence data (2017). Missouri Life Sciences Week, University of Missouri (Poster Presentation)

Durbin HJ, Rowan TN, Taylor JF, Schnabel RD, Gower G, Llamas B, Cooper A, Decker JE. Delineation of cattle demographic history using whole genome sequence data (2017). Gordon Research Conference on Quantitative Genetics and Genomics (Poster Presentation)

Durbin HJ, Rowan TN, Taylor JF, Schnabel RD, Gower G, Llamas B, Cooper A, Decker JE. Delineation of cattle demographic history using whole genome sequence data (2017). Gordon Research Seminar on Quantitative Genetics and Genomics (Poster Presentation)

OUTREACH AND EXTENSION

2020

Southeast Missouri Cattlemen's spring meeting

Presentation: "Using hair shedding scores to select heat tolerant cattle"

Angus Beef Bulletin, January edition

Popular press article: "New hair-shedding EPD will improve profitability through heat tolerance"

Missouri Beef Genetics & Genomics curriculum

Worked with University of Missouri Agricultural Education researcher to develop a livestock breeding & genetics curriculum to be used in classrooms across the state of Missouri

2019

University of Missouri Thompson Research Center Field Day

Extension presentation: "EPDs for environmental adaptation"

SimTalk Magazine, March edition

Popular press article: "A Tool to Match Cows to their Environment"

American Simmental Association webinar

Presentation: "Hair shedding: a novel trait with production impacts"

Mizzou Repro Video Series

Extension video: "Economic Selection Indexes"

2018

Brangus Journal Magazine, November edition

Popular press article: "A Tool to Match Cows to their Environment"

MU Animal Sciences Exploration Day

Outreach event for highschoolers considering careers in animal science, genetics section organizer and volunteer

University of Missouri Thompson Research Center Field Day

Extension presentation: "Hair Shedding Scores: A Tool to Select Heat Tolerant Cattle"

University of Missouri Southwest Research Center Field Day

Extension presentation: "Hair Shedding Scores: A Tool to Select Heat Tolerant Cattle"

Missouri FFA Agriscience Fair

Volunteer judge, Animal Science section

2017

MU Animal Sciences Exploration Day

Outreach event for highschoolers considering careers in animal science, genetics section organizer and volunteer

University of Missouri Thompson Research Center Field Day

Extension presentation: "Using hair shedding scores to select well adapted cattle"

TEACHING

2020

Teaching Assistant, Introduction to workflowR Tutorial at useR! 2020 Conference

Supervisor: Dr. John Blischak

Facilitator, "A brief introduction to using R and the tidyverse for data manipulation"

Created and facilitated workshop given to students in the University of Missouri's Genetics Area Program

2018

Teaching Assistant, ANSCI 4314 Physiology of Reproduction

Supervisor: Dr. Michael F. Smith, University of Missouri

2017

Teaching Assistant, ANSCI 1001 Biology of Animal Production I

Supervisors: Dr. Bryon Wiegand, Dr. Thomas McFadden, Dr. Matthew Lucy, Addison Byrne, University of Missouri

2016

Teaching Assistant, ANSCI 1001 Biology of Animal Production I

Supervisors: Dr. Bryon Wiegand, Dr. Matthew Lucy, Addison Byrne, University of Missouri

MENTORING

2018

Aaron Mott

University of Missouri undergraduate student

Brian Arisman

University of Missouri Miller Intern and University of Kentucky undergraduate student

2017

Katherine Barnett

MU Animal Sciences Graduate Experience Program student

Sara Van Ausdal

University of Missouri Miller Intern and William Woods University undergraduate student

2016

Natalie Barr

University of Missouri undergraduate student

LEADERSHIP

Fundraising Chair, MU Animal Sciences Graduate Student Association

2017, 2018

Genetics Section Chair, MU Animal Sciences Academic Decathlon

2017, 2018, 2019, 2020

PROFESSIONAL ORGANIZATIONS

American Association for the Advancement of Science Program for Excellence

2019-present

Genetics Society of America

2018-present

National Center for Science Education

2017-present

Alpha Zeta Agricultural Honor Society

2013-2016

WORKSHOPS AND TRAINING

Population Genetics Workshop, University of Washington Summer Institute in Statistical Genetics 2020

Three-day workshop focused on the application of population genetics methods to whole-genome sequencing data, particularly identification of population structure and selection as well as simulation of data

Bayesian Statistics for Genetics Workshop, University of Washington Summer Institute in Statistical Genetics 2020

Three-day workshop introducing concepts of Bayesian statistics and their application to genetic analyses

Big Data in R Workshop, R Studio Conference 2019

Two-day workshop focused on accessing and analyzing remotely stored data using R packages and Apache Spark

DISSERTATION COMMITTEE

Dissertation title: "Genomics of seasonal hair shedding and ecoregion-specific growth to identify environmentally adapted beef cattle"

Dr. Jared E. Decker (chair) - Division of Animal Sciences, University of Missouri

Dr. Jeremy F. Taylor - Curators' Professor and Wurdack Chair of Animal Genomics, Division of Animal Sciences, University of Missouri

Dr. Robert D. Schnabel - Division of Animal Sciences, University of Missouri

Dr. Elizabeth G. King - Division of Biological Sciences, University of Missouri

Dr. Stephen P. Miller - Director of Genetic Research, Angus Genetics, Inc.