

# DANIEL R. KICK, PHD

- Experience with **statistics, programming, machine learning, and deep learning.**
- Designed NIFA funded research plan ([Grant 2023-67012-39485](#)).
- Presented to scientific and general audiences **30 times** since 2016.
- Developed **statistical tool** used by **>700 students** as of 2021.
- Data and models downloaded over **235 times** and viewed over **690 times**.
- Led 4 teaching assistants and mentored 7 research students.



## PROFESSIONAL AND RESEARCH EXPERIENCE

Present  
|  
2021

### Research Geneticist

Jacob Washburn Lab, USDA-ARS

- Secured \$225,000 to develop “Environmentally Aware Deep Learning Based Genomic Selection And Management Optimization For Maize Yield” from the National Institute of Food and Agriculture (NIFA) ([Grant 2023-67012-39485](#)).
- Employed **deep neural networks, machine learning models, and best linear unbiased predictors** to **improve corn yield prediction accuracy** in diverse environments.
- **Communicated** with stakeholders via **15 presentations** (5 national, 6 regional, 4 outreach).
- **Mentored** 2 students conducting a high throughput root phenotyping experiment.
- **Created** and taught a **Python data visualization workshop** titled “Tools and Techniques for a Jupyter Based Scientific Workflow”.
- Completed **Software Carpentries instructor certification**, taught R for **Reproducible Scientific Analysis**, and assisted in teaching **Data Management with SQL**.
- Designed and completed a professional development curriculum with the guidance of an industry scientist via the **Bayer-University Mentoring Program**.
- Served as a **panel member** on “Next-Generation Omics” at the 2022 University of Missouri Division of Biological Sciences Retreat.

2021  
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2015

### Graduate Researcher

David Schulz Lab, University of Missouri

- **Author** on **6 publications**: 4 original research and 2 eLife Insight publications.
- **Assessed the efficacy of machine learning models** to identify cell identity from mRNA and contig abundances. **Applied cluster estimation, hyperparameter tuning, unsupervised machine learning, and supervised machine learning.** Identified and learned needed skills primarily through self study. Collaborated with molecular biology project lead. (see *Northcutt<sup>1</sup>, Kick<sup>1</sup>, et al. 2019*).
- Defined research question and experiments. **Developed novel approaches** to quantify changes in cell activity.
- Collaborated with **electrophysiologists**, assisting with data analysis.
- Collaborated with **computational neuroscientists**, contributing domain expertise.
- **Mentored 5 students** and oversaw their projects.
- Communicated results through **18 presentations** (6 national, 6 regional, 6 outreach).
- Served as a **peer mentor** of **3 PhD students** in use of R for reproducible data analysis, created internal documents on same.

2021  
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2020

### Lead Teaching Assistant, Animal Physiology Lab

Biological Sciences, University of Missouri

- Developed **statistics web application** used by more than **700 students** as of 2021 with shiny ([source](#), [deployed](#)) for data visualization, testing assumptions, and fitting frequentist, non-parametric, and Bayesian models.
- Led 4 Teaching Assistants and coordinated adaptation of lab curriculum to be fully online due to COVID-19 pandemic.
- **Mentored** next Lead Teaching Assistant, created documentation on best practices.

## CONTACT INFO

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📄 [daniel-kick-5a449b9a](#)

🔗 [Google Scholar](#)

🐙 [github.com/danielkick](#)

🌐 [danielkick.com](#)

## EDUCATION

### PhD: Biological Sciences

University of Missouri,  
Columbia, MO (2021)

Machine Learning Methods for  
Biomedical Informatics,  
Quantitative Methods in the Life  
Sciences, and Grant Writing

### Bachelor of Science: Biology

Truman State University,  
Kirksville, MO (2015)

Next Generation Sequence Data  
and Analysis, Bioinformatics

Leadership role in the biological  
honors society Tri-Beta

## Technical Skills

📄: R Programming (7 years)  
and experience with  
**tidyverse, lme4, caret,**  
**ggplot2, shiny,** & package  
creation.

📄: Python Programming (3  
years) and experience with  
**pandas, numpy, plotly,**  
**scikit-learn, keras,**  
**pytorch.**

📄: Miscellaneous Experience  
with high performance  
computing (**bash, slurm**),  
virtual environments (**conda,**  
**singularity**), version control  
(**git, GitHub**), literate  
programming (**Rmarkdown,**  
**Jupyter**), crop growth  
modeling (**APSIM Next**  
**Generation**).

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2020  
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2018

● **Teaching Assistant, Animal Physiology Lab**

Biological Sciences, University of Missouri

- Updated and refined curriculum, delivered lectures and ensured experiments were conducted safely, and modeled student grade distributions to identify and adjust for differences in grading.

2018

● **Curriculum Consultant, Animal Physiology Lab**

Biological Sciences, University of Missouri

- Redesigned course material to incorporate primary literature and data analysis.

2016  
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2015

● **Teaching Assistant, Animal Physiology Lab**

Biological Sciences, University of Missouri

- Delivered weekly lectures, ensured experiments were conducted safely, provided timely feedback on assignments.

2013  
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2015

● **Undergraduate Researcher**

University of Missouri, University of Connecticut, and Truman State University

- Designed a hydroponic system for maize root phenotyping –(2014-2015), Quantified retinal minor splice expression using immunohistochemistry – (2014), Measured effectiveness of oligonucleotide treatment for spinal muscular atrophy in mice – (2013).



## HONORS AND AWARDS (4/5)

2025  
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2023

● **NIFA Fellowship (AFRI EWD)**

**\$225,000** awarded (Grant # 2023-67012-39485) over two years to create and environmentally aware deep learning genomic selection models and prepare the recipient to transition into industry.

2019

● **J. Perry Gustafson Award for Outstanding Graduate Research in the Life Sciences**

This **\$2,000 award** is granted for the quality of their research and academic achievements.

2018  
|  
2016

● **NIH T32 Training Grant Recipient**

This provides a \$27,000 yearly stipend and \$750 yearly to facilitate presenting research at scientific conferences.

2015

● **Cum Laude & President's Recognition, Truman State University**



## SELECTED PUBLICATIONS (SHOWING 4/9 PUBLISHED, 0/2 IN PREP.)

2023

● **Ensemble of Best Linear Unbiased Predictor, Machine Learning, and Deep Learning Models Predict Maize Yield Better Than Each Model Alone**

*Daniel R. Kick*, Jacob D. Washburn *in Silico Plants*

2023

● **Yield Prediction Through Integration of Genetic, Environment, and Management Data Through Deep Learning**

*Daniel R. Kick*, Jason G. Wallace, James C. Schnable, Judith M. Kolkman, Baris Alaca, Timothy M. Beissinger, David Ertl, Sherry Flint-Garcia, Joseph L. Gage, Candice N. Hirsch, Joseph E. Knoll, Natalia de Leon, Dayane C. Lima, Danilo Moreta, Maninder P. Singh, Teclemariam Weldekidan, Jacob D. Washburn [G3: Genes, Genomes, Genetics](#)

2022

● **Timing dependent potentiation and depression of electrical synapses contributes to network stability in the crustacean cardiac ganglion**

*Daniel R. Kick* and David J. Schulz [The Journal of Neuroscience](#)

2019

● **Molecular profiling of single neurons of known identity in two ganglia from the crab *Cancer borealis***

Adam J. Northcutt<sup>1</sup>, *Daniel R. Kick*<sup>1</sup>, Adriane G. Otopalik, Benjamin M. Goetz, Rayna M. Harris, Joseph M. Santin, Hans A. Hofmann, Eve Marder, and David J. Schulz (<sup>1</sup> denotes co-first authorship) [Proceedings of the National Academy of Sciences](#)