

Katherine L. Thompson

Dr. Bing Zhang Department of Statistics
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Lexington, KY 40536-0082

Education

- 2013 **Ph.D., Statistics**, The Ohio State University.
Dissertation Title: Using ancestral information to search for quantitative trait loci in genome-wide association studies
Advisor: Professor Laura Kubatko
- 2010 **M.S., Statistics**, The Ohio State University.
- 2008 **B.S., Mathematics**, University of Kentucky.
magna cum laude, Departmental Honors in Mathematics
Honors in the Honors Program
- 2008 **B.S., Biology**, University of Kentucky.
magna cum laude, Departmental Honors in Biology
Honors in the Honors Program

Professional Experience

- 2019–Present Associate Professor, Dr. Bing Zhang Department of Statistics, University of Kentucky.
- 2019–Present Director of Graduate Studies, Dr. Bing Zhang Department of Statistics, University of Kentucky.
- 2013–2019 Assistant Professor, Department of Statistics, University of Kentucky.
- 2009–2013 Graduate Teaching Associate, Department of Statistics, The Ohio State University.

Research Interests

- Theory and applications for identification of interaction effects in data with large sample sizes and/or large numbers of variables
- Statistical genetics, in particular phylogenetic analysis and applications in cardiovascular health

Publications

- **Thompson, K.L.** and L.S. Kubatko. 2013. Using ancestral information to detect and localize quantitative trait loci in genome-wide association studies. *BMC Bioinformatics*, **14**:200. PMID: 23786262 PMCID: PMC3706278.
- Manning J., Yin, G., Kaminski, C., Magyar, J., Feng, H.-Z., Penn, J., Sievert, G., **Thompson, K.**, Jin, J.-P., Andres, D. and J. Satin. 2013. Rad GTPase deletion increases L-type calcium channel current leading to increased cardiac contraction. *Journal of the American Heart Association*, **2**(6):e000459. PMID: 24334906 PMCID: PMC3886777.

- **Thompson, K.L.**, Charnigo, R., and C.R. Linnen. 2013. Using ancestral information to inform analyses of complex data sets. *Journal of Biometrics and Biostatistics*, **4**:e126. (Invited commentary).
- **Thompson, K.** and R. Charnigo. 2015. Parallel computing in genome-wide association studies. *Journal of Biometrics and Biostatistics*, **6**:e131. (Invited commentary).
- **Thompson, K.L.** and D.W. Fardo. 2016. Comparing performance of non-tree-based and tree-based association mapping methods. *BMC Proceedings*, **10**(7):405-410. PMID: 27980669 PMCID: PMC5133494.
- Pumphrey, A., Zhengshi, Y., Ye, S., Thalman, S., Watt, D., Abdel-Latif, A., Unrine, J., **Thompson, K.**, Fornwalt, B., Ferrauto, G., and Vandsburger, M. 2016. Advanced cardiac chemical exchange saturation transfer (cardioCEST) MRI for *in vivo* cell tracking and metabolic imaging. *NMR in Biomedicine*, **29**(1):74-83. PMID: 26684053 PMCID: PMC4907269.
- Gawriluk, T.R., Simkin, J., **Thompson, K.L.**, Biswas, S., Clare-Salzler, Z., Kimani, J.M., Kiama, S.G., Ezenwa V.O., Smith, J.J., and Seifert, A.W. 2016. Comparative analysis of ear-hole closure identifies epimorphic regeneration as a discrete trait in mammals. *Nature Communications*, **7**:11164. PMID: 27109826 PMCID: PMC4848467. (Co-First Author)
- Noehren, B., A. Andersen, P. Hardy, D. Johnson, M. Ireland, **K. Thompson**, and B. Damon. 2016. Cellular and Morphological Alterations in the Vastus Lateralis Muscle as the Result of ACL Injury and Reconstruction. *Journal of Bone & Joint Surgery, American Volume*. **98**(18):1541–1547. PMID: 27655981 PMCID: PMC5026157.
- Harper, K.E., Bagley, R.K., **Thompson, K.L.**, and Linnen, C.R. 2016. Complementary sex determination, inbreeding depression, and inbreeding avoidance in a gregarious sawfly. *Heredity*, **117**:326-335. PMID: 27381325 PMCID: PMC5061915.
- **Thompson, K.L.**, Linnen, C.R., and L.S. Kubatko. 2016. Tree-based quantitative trait mapping in the presence of external covariates. *Statistical Applications in Genetics and Molecular Biology*, **15**(6): 473-490. PMID: 27875322.
- Thrailkill, K., Nyman, J., Bunn, R., Uppuganti, S., **Thompson, K.**, Lumpkin, C., Kalaitzoglou, and J.L. Fowlkes. 2017. The impact of SGLT2 inhibitors, compared with insulin, on diabetic bone disease in a mouse model of Type 1 Diabetes. *Bone*. **94**:141-151. PMID: 27989651. PMCID: PMC5826569.
- Gober, M.K., **Thompson, K.L.**, and P. Black. 2017. A microRNA signature of response to erlotinib is descriptive of TGF β behaviour in NSCLC. *Scientific Reports*. **7**: 4202. PMID: 28646226 PMCID: PMC5482799.
- Ebersole, J.L., Dawson D., Emecen-Huja, P., Nagarajan, R., Howard, K., Grady, M.E., **Thompson, K.**, Peyyala, R., Al-Attar, A., Lethbridge, K., Kirakodu, S., and O.A. Gonzalez. The periodontal war: microbes and immunity. 2017. *Periodontology 2000*. **75**(1):52-115. PMID: 28758303.
- Nelson, P.T., Wang, W.-X., Janse*, S.A., and **K.L. Thompson**. 2018. MicroRNA expression patterns in human anterior cingulate and motor cortex: A study of dementia with Lewy bodies cases and controls. *Brain Research*. **1678**: 374-383. PMID: 29146111 PMCID: PMC5752138.

- Jacobs, C.A., Vranceanu, A.-M., **Thompson, K.L.**, and C. Lattermann. 2020. Rapid progression of knee pain and osteoarthritis biomarkers greatest for patients with combined obesity and depression: Data from the Osteoarthritis Initiative. *Cartilage*. **11**(1):38-46. PMID: 29855190 PMCID: PMC6921961.
- Lambert, J.W., Liyu, G., Elliott, C., **Thompson, K.L.**, and A.J. Stromberg. 2018. rFSA: An R package for finding best subsets and interactions. *R Journal*. **10**(2).
- Erickson, L.N., Hickey Lucas, K.C., Davis, K.A., Jacobs, C.A., **Thompson, K.L.**, Hardy, P.A., Andersen, A.H., Fry, C.S., and B. Noehren. 2019. Effect of Blood Flow Restriction Training on quadriceps strength and knee biomechanics before and after Anterior Cruciate Ligament reconstruction: A randomized clinical trial. *Accepted/In Press at Physical Therapy*.
- Janse*, S. and **K.L. Thompson**. 2019. Properties of the number of iterations of a feasible solutions algorithm. In: Diawara N. (eds) Modern Statistical Methods for Spatial and Multivariate Data. STEAM-H: Science, Technology, Engineering, Agriculture, Mathematics & Health. Springer, Cham.
- Bhavsar, I., Miller, C.S., Ebersole, J.L., Dawson III, D.R., **Thompson, K.L.** and Al-Sabbagh, M. 2019. Biological response to peri-implantitis treatment. *Journal of periodontal research*. **54**(6), 720-728.
- AlSiraj, Y., Chen, X., Thatcher, S.E., Temel, R.E., Cai, L., Blalock, E., Katz, W., Ali, H.M., Petriello, M., Deng, P., Morris, A.J., Wang, X., Lusic, A.J., Arnold, A.P., Reue, K., Thompson, K., Tso, P., and Cassis, L.A. 2019. XX sex chromosome complement promotes atherosclerosis in mice. *Nature communications*. **10**(1), 2631.
- Jacobs, C.A., Hawk*, G.S., Jochimsen, K.N., Conley, C.E.W., Vranceanu, A.M., **Thompson, K.L.** and Duncan, S.T. 2020. Depression and anxiety are associated with increased health care costs and opioid Use for patients with femoroacetabular impingement undergoing hip arthroscopy: Analysis of a claims database. *Arthroscopy: The Journal of Arthroscopic & Related Surgery*.
- Elliott, C. F., Lambert, J. W., Stromberg, A. J., Wang, P., Zeng, T., and **Thompson, K. L.** (2020). Feasibility as a mechanism for model identification and validation. *Journal of Applied Statistics*, 1-20.
- Blair, C. A., Brundage, E. A., **Thompson, K. L.**, Stromberg, A., Guglin, M., Biesiadecki, B. J., and Campbell, K. S. (2020). Heart failure in humans reduces contractile force in myocardium from both ventricles. *JACC: Basic to Translational Science*, 5(8), 786-798.
- Walsh, S. L., El-Bassel, N., Jackson, R. D., Samet, J. H., Aggarwal, M., Aldridge, A. P., . . . and The HEALing Communities Study Consortium (2020). The HEALing (Helping to End Addiction Long-term SM) Communities Study: Protocol for a cluster randomized trial at the community level to reduce opioid overdose deaths through implementation of an integrated set of evidence-based practices. *Drug and Alcohol Dependence*, 217, 108335.
- Cronin, K. J., Mair, S. D., Hawk*, G. S., **Thompson, K. L.**, Hettrich, C. M., and Jacobs, C. A. (2020). Increased health care costs and opioid use in patients with anxiety and depression undergoing rotator cuff repair. *Arthroscopy: The Journal of Arthroscopic & Related Surgery*, 36(10), 2655-2660.

- Alnabelsi, T. S., Gupta, V. A., Su*, L. C., **Thompson, K. L.**, Leung, S. W., and Sorrell, V. L. (2020). Usefulness of Findings by Multimodality Imaging to Stratify Risk of Major Adverse Cardiac Events After Sepsis at 1 and 12 months. *The American journal of cardiology*, 125(11), 1732-1737.
- Jacobs, C. A., Vranceanu, A. M., **Thompson, K. L.**, and Lattermann, C. (2020). Rapid progression of knee pain and osteoarthritis biomarkers greatest for patients with combined obesity and depression: data from the osteoarthritis initiative. *Cartilage*, 11(1), 38-46.
- Van Wyngaarden, J. J., Jacobs, C., **Thompson, K.**, Eads, M.; Johnson, D., Ireland, M. L., and Noehren, B. (2021). Quadriceps Strength and Kinesiophobia Predict Long-Term Function After ACL Reconstruction: A Cross-Sectional Pilot Study. *Sports Health*, 13(3), 251-257.
- Cronin, K. J., Magnuson, J. A., Wolf, B. R., Hawk*, G. S., **Thompson, K. L.**, Jacobs, C. A ... and MOON Shoulder Group. (2021). Male sex, Western Ontario Shoulder Instability Index score, and sport as predictors of large labral tears of the shoulder: A Multicenter Orthopaedic Outcomes Network (MOON) shoulder instability cohort study. *Arthroscopy: The Journal of Arthroscopic & Related Surgery*, 37(6), 1740-1744.
- Zacharias, A. J., Lemaster, N. G., Hawk*, G. S., Duncan, S. T., **Thompson, K. L.**, Jochimsen, K. N., ... and Jacobs, C. A. (2021). Psychological Healthcare Burden Lessens After Hip Arthroscopy for Those With Comorbid Depression or Anxiety. *Arthroscopy, Sports Medicine, and Rehabilitation*, 3(4), e1171-e1175.

* denotes graduate student co-author

Publications in Progress

- Kane, J., Rusinko, J., and **K. Thompson**. Phylogenetic Derivative: A Tool for Assessing Local Tree Reconstruction in the Presence of Recombination. *Under revision at BMC Evolutionary Biology; arXiv preprint arXiv:1710.10326*.
- Rutledge, M.H., Stromberg, A.J., and **K.L. Thompson**. A Graphical Tool for Model Building Using Variability in AIC. *Under Review*.
- **K.L. Thompson**. Incorrect model selection using R^2 and Akaike Information Criterion in big data analyses. *In preparation*.
- Rusinko, J., Doherty, A., Cai, Y., Straub, S., Boutte, J., Fischebein, M. and **Thompson, K.** Taxa Selection and Species Tree Construction using Quartets Weighted by Bayes Factors. *In preparation*.

* denotes graduate student co-author

Invited Presentations

- “Tree-based Quantitative Trait Mapping in the Presence of External Covariates”, Kentucky Chapter of the American Statistical Association Meeting, Lexington, Kentucky, April 2014.
- “Detecting genetic differences connected to variation in cardiovascular disease among patients”, University of Kentucky Saha Cardiovascular Research Center, Lexington, Kentucky, October 2014.

- “Quantitative trait mapping in the presence of external covariates”, Kentucky Biomedical Research Infrastructure Network (KBRIN) Bioinformatics core at the University of Louisville, Louisville, Kentucky, November 2014.
- “Searching for genetic differences connected to variation in quantitative traits”, Department of Biology, Eastern Kentucky University, Richmond, Kentucky, February 2015.
- “Quantitative trait mapping methods for complex data sets”, Department of Biostatistics and Bioinformatics, University of Louisville, Louisville, Kentucky, March 2015.
- “Connecting calculus and statistics using texting and genetics”, Math Club (Department of Mathematics), University of Kentucky, Lexington, Kentucky, March 2015.
- “A phylogenetic model for quantitative trait mapping with complex data sets”, The Mathematics of Evolution (Special Session at the Fall Central Sectional Meeting of the American Mathematical Society), Loyola University, Chicago, Illinois, October 2015.
- “Genetics, texting, coffee, and sports: connections from statistics”, High School Mathematics Day for Women, University of Kentucky, Lexington, Kentucky, November 2015.
- “Extending phylogenetic methods for quantitative trait mapping for application to complex data sets”, Geometric Phylogenetics Minisymposium, SIAM Life Sciences meeting, Boston, Massachusetts, July 2016.
- “Correct model selection in multiple regression analyses of big data”, Kentucky Biomedical Research Infrastructure Network (KBRIN) Bioinformatics Retreat, Shaker Village, Kentucky, August 2017.
- “Research Use Case In the Precision Medicine Platform”, American Heart Association Research Leader’s Academy, Salt Lake City, Utah, August 2018.
- “Research In the Precision Medicine Platform”, American Heart Association Scientific Sessions, Chicago, Illinois, November 2018.
- “Graduate School and Career Opportunities in STEM Fields”, Clemson University Math Club, Clemson, South Carolina, January 2020.
- “Graduate School and Career Opportunities in STEM Fields”, Clemson University Math Club, given via Zoom, November 2020.
- “University of Kentucky: Successful Communication with your Program of Interest ”, given via Zoom, University of Kentucky, September 2021.

Contributed Presentations

- “A robust and efficient statistic for detecting heterogeneous cancer samples”, Joint Statistical Meetings, Miami Beach, Florida, August 2011.
- “Using ancestral information to search for quantitative trait loci in genome-wide association studies”, Joint Statistical Meetings, Montréal, Quebec, August 2013.
- “Tree-Based Quantitative Trait Mapping in the Presence of External Covariates”, Joint Statistical Meetings, Boston, Massachusetts, August 2014.
- “Population-based Association Analyses”, Genetics Analysis Workshop, Vienna, Austria, August 2014 (*Co-presenter*).
- “A phylogenetic method for quantitative trait mapping with complex data sets”, Joint Statistical Meetings, Seattle, Washington, August 2015.
- “A phylogenetic model for association mapping with multiple loci”, Joint Statistical Meetings, Chicago, Illinois, August 2016.
- “Using phylogenetic models for quantitative trait mapping with multiple loci”, Joint Statistical Meetings, Baltimore, Maryland, August 2017.
- “Correct model selection in multiple regression analyses of big data”, Commonwealth Com-

putational Summit, Lexington, Kentucky, October 2017.

- “Using phylogenetic models for quantitative trait mapping with multiple loci”, Joint Statistical Meetings, Vancouver, Canada, July 2018.
- “Correct model selection in big data analyses”, Joint Statistical Meetings, Vancouver, Canada, August 2018.
- “Developing and Maintaining Biomedical Collaborations”, Women in Statistics and Data Science, Cincinnati, Ohio, October 2018 (*Panel organizer/moderator*).
- “Phylogenetic Derivative: a Tool for Assessing Local Tree Reconstruction”, Joint Statistical Meetings, Denver, Colorado, August 2019.

Poster Presentations

- “Tree-based Quantitative Trait Mapping in the Presence of External Covariates”, Women in Statistics Conference, Cary, North Carolina, May 2014.
- “Modeling Interaction Effects in Genomic Data”, Southern Regional Council on Statistics Summer Research Conference, Bentonville, Arkansas, June 2016. (Presenter: Sarah Janse)
- “Probability of Correct Model Choice Using R^2 or AIC in Model Selection”, Southern Regional Council on Statistics Summer Research Conference, Virginia Beach, Virginia, June 2018.
- “Using the Feasible Solutions Algorithm to Identify Combinations of Genetic Factors Associated with Multiple Sclerosis”, National IDEa Symposium of Biomedical Research Excellence, Washington D.C., June 2018.

Funding

Funding - Active

1R01AR078316-01A1 (Noehren) 08/05/2021-05/31/2026 5% effort
NIH/NIAMS \$647,071

Sex-based Muscular Adaptations, Capillary Dysfunction and Functional Decline Impact Knee-related Psychosocial Outcomes After Acute Knee Injury (SMACK)

This proposal seeks to test the novel hypothesis that following an ACL injury, females experience exaggerated muscle capillary rarefaction and greater muscle fiber atrophy, hindering their recovery of muscle strength, resulting in pronounced deficits in gait mechanics and disproportionately worse psychosocial recovery compared to males.

Role: Co-Investigator

W81XWH-21-1-0273 (Noehren) 08/01/2021-07/31/2024 10% effort

Army Medical Research and Materiel Command Accelerating Recovery Following a Lower-Extremity Fracture Through Speed HIIT

The major goal is establish the feasibility and test to see that the Speed HIIT program will lead to significant improvements over baseline in the knee extensor moment, peak ground reaction force, quadriceps muscle strength as compared to standard of care. As a secondary objective we hypothesize that the speed HIIT walk program will lead to a significant improvement in pain self-efficacy and fear of movement over baseline as compared to the standard of care.

Role: Co-Investigator

1000100147 (Thompson) 07/01/2021-06/30/2022 1.4% effort
NSF \$49,966

SRCOS Summer Research Conference 2021

This is an NSF conference grant designed to improve the diversity of graduate students in STEM and in particular, the statistical sciences.

Role: Principal Investigator

1R01AR078316-01A1 (Stromberg) 05/01/2021-04/30/2022 4% effort
NIH \$313,650

Ky IDeA Network of Biological Excellence

The goal of Ky IDeA Network of Biological Excellence (KY INBRE) is to develop a network of support for biomedical researchers and educators within the Commonwealth of Kentucky. The purpose of the network is to develop infrastructure and capacity for biomedical research and training in the state.

Role: Co-Investigator

W81XWH2020035 (Hoch) 09/15/2020-09/14/2024 8% effort
DOD \$1,732,519

Optimizing Clinical Outcomes for Patients with Chronic Ankle Instability Using Foot Intensive Rehabilitation (FIRE)

The purpose of this randomized controlled trial is to demonstrate that a novel Foot Intensive Rehabilitation (FIRE) protocol has the potential to create more effective clinical outcomes compared to SOC rehabilitation for patients with chronic ankle instability.

Role: Co-investigator

651996 (Gensel) 07/31/2020-07/30/2023 5% effort
Craig H Neilsen Foundation \$598,115

The Role of Lipid Dysfunction in Spinal Cord Injury Pathophysiology

Individuals with spinal cord injury suffer from cardiovascular disease at higher rates than able-bodied individuals. The objective of this proposal is to determine the role of high-density lipoprotein (HDL) on the pathophysiology of atherosclerosis and secondary injury after spinal cord injury.

Role: Co-investigator

PON2 746 2000004029 (Thompson) 07/01/2020-06/30/2022 19.8% effort
Commonwealth of Kentucky, CHFS \$389,730

Using Data Science Tools to Analyze Medicaid Claims Data and Better Understand Cardiovascular Disease

The goal of this proposal are to use data science to understand and represent infective endocarditis claims or chronic diseases (e.g., hypertension) from Kentucky Medicaid beneficiaries and produce Medicaid data use cases to provide guidance on good practices for handling missing data in claims data analysis.

Role: Principal Investigator

PON2 721 2000003082 (Talbert, J) 07/01/2020-06/30/2022 10% effort
KY Cabinet for Health and Family Services \$3,803,332

Research, Data Analytics, & Measurement of Program Outcomes: 1115 Waiver

This work aims to use predictive analytics to model and predict future overdoses of Kentucky Medicaid beneficiaries using existing Medicaid claims and Kentucky All Schedule Prescription Electronic Reporting (KASPER) data.

Role: Co-Investigator

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| W81XWH2010449 (Jacobs) | 07/01/2020-06/30/2024 | 5% effort |
| DOD | \$2,889,181 | |
| Altering Posttraumatic Osteoarthritis after Patellar Dislocation: Blood Flow Restriction training, Aspiration, and Intraarticular Normal Saline (BRAINS Trial) | | |
| The purpose of this innovative randomized clinical trial is to determine if knee aspiration and saline injection or blood flow restriction training (BFRT), either individually or combined, will improve outcomes after patellar dislocation. | | |
| Role: Co-investigator | | |
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| 1R01HL152081-01 (Venditto) | 07/01/2020-06/30/2024 | 5% effort |
| NIH/NHLBI | \$1,893,405 | |
| Understanding the role of anti-apolipoprotein A-I antibodies in atherosclerotic cardiovascular disease | | |
| The overall goal of this project is to elucidate the role of ApoA-I/IgG ICs and elucidate their functional impact in ASCVD. To achieve this goal, we will characterize the molecular components of ApoA-I/IgG ICs in mouse and patient sera samples and correlate these factors with cellular interactions, functional outcomes and disease progression. | | |
| Role: Co-investigator for Statistical Support | | |
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| 1R01HL149164-01A1 (Campbell) | 07/01/2020-06/30/2024 | 5% effort |
| NIH | \$2,946,363 | |
| Length-dependent activation in human myocardium | | |
| This project uses samples from organ donors and patients undergoing cardiac transplant in order to better understand changes in length-dependent activation induced by myocardial stretch. | | |
| Role: Co-Investigator | | |
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| 4478 (Aneja) | 01/01/2020-12/31/2021 | 2.5% effort |
| Orthopaedic Trauma Association | \$102,958 | |
| Inflammatory Response to Trauma - Does Early Cytokine Modulation Improve Patient Outcome? | | |
| The present prospective randomized clinical study will test the hypothesis that administering a NSAID (Ketorolac) in low dose for a brief time period will improve the clinical outcomes of orthopaedic trauma patients. | | |
| Role: Co-investigator | | |
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| 1UM1DA049406 (Walsh, S) | 05/01/2019-01/21/2023 | 10% effort |
| NIH/NIDA | \$2,897,226 | |
| Kentucky CAN HEAL (Communities and Networks Helping End Addiction Long-term) | | |
| The Kentucky CAN (Communities and Networks) HEAL (Helping End Addiction Long-term) study is a large-scale, community intervention project submitted in response to the HEALing Communities request for proposals to “test the immediate impact of implementing an integrated set of evidence-based interventions” with the aim of reducing opioid overdose deaths by 40% in three years. | | |
| Role: co-PI for statistical support | | |
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| 1P30GM127211-01 (Cassis, L) | 08/01/2018-07/31/2023 | 7% effort |
| NIH/NIGMS | \$1,147,500 | |
| Center of Research in Obesity and Cardiovascular Disease (Phase III) | | |

The major goal of this project is to further develop a critical mass of funded investigators in the COCVD and expand core facilities established during Phase II support.
Role: Statistician

1R01AR072061-01A1 (Fry, Noehren) 04/01/2018 – 03/31/23 3.9% effort
NIH/NIAMS \$379,579

Myostatin alters muscle composition as the result of an ACL injury

The major goal of this project is to determine the efficacy of myostatin blockade in a mouse model of ACL injury to improve muscle mass, strength and morphology. Additionally, the goal is to determining the contribution of myostatin activation in patients following an ACL injury and reconstruction to underlying muscle cellular deficits that contribute to protracted muscle weakness.

Role: Co-Investigator

5R01DK113625-03 (Graf, G) 09/13/2017-07/31/2022 4% effort
NIH/NIDDK \$295,139

Contributions of hepatic and intestinal pathways to cholesterol excretion

The major goals of this project are to determine the impact of biliary cholesterol secretion on intestinal cholesterol secretion rates, II) determine the lipoprotein donors to both the biliary and intestinal pathway under conditions of high and low biliary cholesterol secretion, and III) determine the molecular mechanisms within the intestinal enterocyte that mediate the adaptive response to alterations in biliary cholesterol secretion.

Role: Co-Investigator for Statistical Support

1R01AR071398-01A1 (Noehren, B) 07/22/2017-06/30/2022 5% effort
NIH/NIAMSD \$96,367

Mechanistic Assessment of Blood Flow Restricted Training for an ACL Injury

This project seeks to mechanistically determine the ability of BFRT to address underlying muscle cellular deficits following anterior cruciate ligament reconstruction compared to usual care.

Role: Co-Investigator for Statistical Support

R305A170574 (Lorch, E) 07/01/2017-06/30/2021 10% effort
US Department of Education, IES \$499,015

Efficacy of a narrative comprehension intervention for elementary school children

This grant studies a proposed intervention for children in elementary school identified as at-risk for attention-deficit hyperactivity disorder.

Role: Co-Investigator for statistical support

1R01AR070313-01A1 (Seifert, A) 03/13/2017-02/28/2022 2% effort
NIH/NIAMS \$220,000

Macrophage phenotype orchestrates mammalian tissue regeneration

The major goals of this are to identify macrophage subtypes that regulate regeneration and manipulate inflammation to stimulate regeneration in response to injury.

Role: Co-Investigator for Statistical Support

Funding - Completed

1R56HL14505-01 (Venditto) 09/20/2019-08/31/2020 5% effort

NIH/NHLBI \$268,654
Understanding the role of anti-apolipoprotein A-I antibodies in atherosclerotic cardiovascular disease

The major objectives of this study are to characterize the molecular components of the anti-ApoA-I antibody response in mice and patient serum samples and correlate their characteristics with cellular interactions, functional outcomes, and atherosclerosis progression.

Role: Co-investigator

PON27461800001666 (Talbert, J) 07/01/2019-06/30/2020 15% effort
KY Cabinet for Health and Family Services \$1,308,824

Research, Data Analytics, & Measurement of Program Outcomes: 1115 Waiver
This work aims to use predictive analytics to model and predict future overdoses of Kentucky Medicaid beneficiaries using existing Medicaid claims and Kentucky All Schedule Prescription Electronic Reporting (KASPER) data.

Role: Co-Investigator

Noehren, B 08/01/2018-02/05/2019 5% effort
ICON Health and Fitness Incorporated \$24,127

Randomized Trial Testing Alterations in Biomechanics Due to Treadmill Design
This grant aims to understand changes in biomechanics on three treadmill types.

Role: Co-Investigator

Subcontract (Thompson, K) 07/01/2018-12/31/2018 20% effort
KY Cabinet for Health and Family Services \$36,166

Research, Data Analytics, & Measurement of Program Outcomes: 1115 Waiver
This work aims to use predictive analytics to model and predict future overdoses of Kentucky Medicaid beneficiaries using existing Medicaid claims and Kentucky All Schedule Prescription Electronic Reporting (KASPER) data.

Role: Principal Investigator of Subcontract

Subcontract (Thompson, K) 07/01/2018-12/31/2018 20% effort
KY Cabinet for Health and Family Services \$36,166

Research, Data Analytics, & Measurement of Program Outcomes: 1115 Waiver
This work aims to use predictive analytics to model and predict future overdoses of Kentucky Medicaid beneficiaries using existing Medicaid claims and Kentucky All Schedule Prescription Electronic Reporting (KASPER) data.

Role: Principal Investigator

Expected Funding Start Date: 9/30/18

5P20GM103527-10 (Cassis, L) 09/08/2008-07/31/2018 2% effort
NIH/NIGMS \$1,499,999

Center of Research in Obesity and Cardiovascular Disease COBRE
The major goal of this project is to develop a critical mass of funded investigators in the COCVD and expand and develop core facilities established during Phase I support.

Role: Statistician

PON2 746 1600000805 (Talbert, J) 07/01/2016-06/30/2018 1% effort
KY Cabinet for Health and Family Services \$1,274,206

Research, Data Analytics, & Measurement of Program Outcomes: 1115 Waiver

The overall research objectives identified as the focus for the scope of work are those articulated in the “Triple Aim”: 1) Better healthcare for individual Medicaid/KCHIP beneficiaries, 2) Improved healthcare for the population (Medicaid/KCHIP), 3) Financial accountability and value-based decision making for healthcare resources.

Role: Assist in Statistical Support

1R21AR070620-01 (Thraill, K) 07/01/2016-05/15/2018 3% effort
NIH/NIAMS \$126,291

Effects of sodium-dependent glucose co-transporter 2 inhibition on bone

The objective of this proposal is to utilize several relevant rodent models to investigate potential mechanisms contributing to the adverse effects of SGLT2-inhibitor therapy on the skeleton.

Role: Co-Investigator for Statistical Support

PP-1609-25975 (Stromberg, A) 03/01/2017-02/28/2018 4% effort
National Multiple Sclerosis Society \$39,164

Identifying gene or SNP based interactions in multiple sclerosis datasets

The goal of this study is to use a novel statistical algorithm to perform secondary data analyses of multiple sclerosis data sets in order to identify gene-gene or SNP-SNP interactions that are associated with multiple sclerosis.

Role: Co-Investigator

Massarweh, S 04/01/2008 - 12/31/2015 2% effort
Novartis

A Phase II Study of Combined Fulvestrant (Faslodex) and Everolimus in Advanced/Metastatic Breast Cancer After Aromatase Inhibitor Failure

This work aimed to study breast cancer tumors, including before and after particular treatments.

Role: Statistician

R305A120171-14 (Lorch, E) 03/01/2012 - 02/29/2016 2% effort
US Department of Education, IES

A Narrative Comprehension Intervention for Elementary School Children At-Risk for Attention-Deficit Hyperactivity Disorder

The goal of this grant is to implement an intervention for children in elementary school identified as at-risk for attention-deficit hyperactivity disorder.

Role: Statistician

Teaching Experience

University of Kentucky:

- Statistics 296: Statistical Methods & Motivations
• Fall 2017
- Class size: 124 students

Statistics 570: Basic Statistical Analysis

- Fall 2013, Fall 2014
- Class sizes: 47 students and 76 students, respectively

Statistics 603: Introduction to Linear Models and Experimental Design

- Spring 2014, Spring 2015, Spring 2016, Spring 2018, Spring 2019, Spring 2020, Spring 2021

- Class sizes: 15 students, 14 students, 15 students, 13 students, 15 students, 11 students, 7 students, respectively

Statistics 605: Computational Inference

- Fall 2013, Fall 2014, Fall 2015, Fall 2016, Fall 2017, Fall 2018
- Class sizes: 14 students, 14 students, 17 students, 15 students, 11 students, and 15 students, respectively

Statistics 645: Introduction to Computational Theory & Data Visualization

- Online class
- Fall 2016, Fall 2019, Fall 2020, Fall 2021
- Class size: 5 students, 14 students, 5 students, 16 students respectively

Statistics 695: Special Topics in Statistical Theory

- Fall 2018
- Class size: 12 students

Other Teaching Experience

The Ohio State University:

Sole Instructor

Statistics 4202: Introduction to Mathematical Statistics II

- Spring 2013
- Class size: 75 students

Statistics 420/4201: Introduction to Mathematical Statistics I

- Autumn 2011, Winter 2012, Autumn 2012
- Class sizes: 71, 165, and 55 students, respectively

Statistics 427: Introduction to Probability and Statistics for Engineering and the Sciences I

- Spring 2011, Summer 2011
- Class sizes: 57 and 82 students, respectively

Statistics 145: Introduction to the Practice of Statistics

- Summer 2010
- Class size: 85 students

Lecturer

Statistics 145: Introduction to the Practice of Statistics

- Autumn 2010, Winter 2011, Spring 2012
- Class sizes: 143, 135, and 52 students, respectively

Recitation Instructor

Statistics 145: Introduction to the Practice of Statistics

- Autumn 2009, Winter 2010, Spring 2010
- Class sizes: 19 to 27 students

Facilitator, University Center for the Advancement of Teaching Summer 2012

- Facilitated an “Introduction to Teaching and Learning” session for the university-wide Teaching Associate orientation
- Used activities to introduce teaching ideas to 18 Teaching Associates from several departments

Instructor, Summer Bridge Program Summer 2012

- Introduced a diverse group of 17 incoming Ohio State freshman to statistics through hands-on activities

Research Associate, Statistics Education Summer 2012

- Supervisor: Dr. Jackie Miller
- Developed curriculum for Statistics 2450 (Introduction to Statistical Analysis I) to be taught under the semester system

Guest Lecturer, Statistics 603: Teaching of Statistics Summer 2010, Summer 2011

- Modeled teaching a recitation activity for new Teaching Associates in the statistics department
- Answered questions and facilitated discussion regarding teaching at the university level

Research Associate, Statistics Education Winter 2010

- Supervisor: Dr. Jackie Miller
- Analyzed pre- and post-test data to evaluate effectiveness of Statistics 145

Student Supervision

Committee Chair

- Gregory Hawk (Statistics) – Current
- Leon Su (Statistics) – Current
- Matthew Rutledge (Statistics; Committee co-chair: Arnold Stromberg) – Defended Fall 2020
Current Position: Senior Consultant, Travelers Insurance
- Sarah Janse (Statistics; Committee co-chair: Arnold Stromberg) – Defended Fall 2017
Current Position: Research Scientist, Center for Biostatistics, The Ohio State University

Doctoral Committee Member – Current

- Justin Barhite (Mathematics)
- Jungjun Bae (Pharmaceutical Sciences)
- Aviv Brokman (Statistics)
- Courtney George (Mathematics)
- Margaret Gurtcheff (Doctorate of Musical Arts)
- Derek Hanely (Mathematics)
- Angela Hanson (Mathematics)
- Kathryn Hechtel (Mathematics)

- Aida Maraj (Mathematics)
- Changrui Liu (Statistics)
- Ya Qi (Statistics)
- Carissa Slone (Mathematics)
- Menghan Wang (Statistics)

Doctoral Committee Member – Past

- Grady Weyenberg (Statistics) – Defended Summer 2015
- Rebecca Crouch (Statistics) – Defended Fall 2016
- Hongyuan Wang (Statistics) – Defended Fall 2016
- Hong Wang (Statistics) – Defended Fall 2016
- Isaiah Harney (Mathematics) – Defended Spring 2017
- Woodrow Burchett (Statistics) – Defended Spring 2017
- Amanda Ellis (Statistics) – Defended Fall 2017
- Caihong Li (Quantitative and Psychometric Methods) – Defended Fall 2018
- Jin Xie (Statistics) – Defended Fall 2018
- Qiwen Kang (Statistics) – Defended Spring 2019
- Zaid Al-Khaledi (Statistics) – Defended Spring 2019
- Alejandro Villasante Tezano (Statistics) – Defended Summer 2019
- Yue Cui (Statistics) – Defended Spring 2020
- Yuntong Li (Statistics) – Defended Spring 2020
- Tingting Zhai (Statistics) – Defended Spring 2020
- Xu Zhang (Statistics) – Defended Spring 2020
- Yan Xu (Statistics) – Defended Fall 2020
- Aisaku Nakamura (Statistics) – Defended Fall 2020
- Christine Williamitis (Nursing) – Defended Spring 2021
- Pei Wang (Statistics) – Defended Summer 2021

Masters Committee Member

- Brittany Camenisch (College of Dentistry) – Defended Spring 2018

Outside Examiner

- Sema Gunturkun (Mathematics) – Defended Spring 2014
- Carolyn Troha (Mathematics) – Defended Spring 2015
- Nicholas Armenoff (Mathematics) – Defended Spring 2015
- Yan Jin (Chemical and Materials Engineering) – Defended Spring 2016
- Jiaqi Liu (Mathematics) – Defended Summer 2017
- Nathan Pauly (Pharmaceutical Sciences) – Defended Spring 2018
- Zhengyan Huang (Epidemiology & Biostatistics) – Defended Spring 2019

Conference Leadership

- 2021 Director, Statistics Undergraduate Research Experience (SURE), Southern Regional Council on Statistics, Summer Research Conference, Villas by the Sea Resort and Conference Center, Jekyll Island, Georgia (33 participants)
- 2019 Program Co-Chair, Southern Regional Council on Statistics, Summer Research Conference, General Butler State Park Resort, Carrollton, Kentucky
- 2019 Director, Statistics Undergraduate Research Experience (SURE), Southern Regional Council on Statistics, Summer Research Conference, General Butler State Park Resort, Carrollton, Kentucky (37 participants)

Workshop Leadership

- 2021 Instructor, Data Analytics Workshop, Statistics Undergraduate Research Experience, Southern Regional Council on Statistics Summer Research Conference, Jekyll Island, Georgia (33 participants)
- 2020 Instructor, Data Analytics Workshop, University of South Carolina Pi Mu Epsilon and Gamecock Math Club, Columbia, South Carolina
- 2020 Instructor, Data Analytics Workshop, University of Tennessee Math Club, Knoxville, Tennessee
- 2019 Instructor, Data Analytics Workshop, Statistics Undergraduate Research Experience, Southern Regional Council on Statistics Summer Research Conference, Carrollton, Kentucky (37 participants)
- 2017 Co-Instructor, Introduction to R Workshop, UT-KBRIN Bioinformatics Summit, Montgomery Bell State Park (over 60 participants)
- 2016 Instructor, Introduction to R for Biologists Workshop, College of Agriculture, Food, and Environment, University of Kentucky (over 50 participants)
- 2016 Instructor, Introduction to R and R Graphics Workshops, Quantitative Initiative for Policy and Social Research, University of Kentucky (approximately 20 participants)
- 2016 Team Leader, SNP Network Team, National Institutes of Health Genomics Hackathon, Bethesda, Maryland
- 2013 Instructor, R for Biologists Workshop, Department of Biology, University of Kentucky (approximately 25 participants)

Service

- 2014-Present Peer Reviewer:
Journal of Biometrics & Biostatistics,
Journal of Molecular Evolution,
Journal of Statistical Software,
Statistical Analysis and Data Mining,
Systematic Biology,
Springer Statistics,
Journal of the Royal Society Interface,
American Heart Association
- 2021-Present Member, Strategic Outcomes Subcommittee, American Heart Association
- 2020-Present Secretary, Southern Regional Council on Statistics
- 2019-Present Chair, Department of Statistics Graduate Studies and Master of Applied
Statistics Committees, University of Kentucky
- 2018-2020 Secretary, Kentucky Chapter of the American Statistical Association
- 2019-2021 Early Career Representative, Bioethics Subcommittee,
American Heart Association
- 2018-2019 Member, Digital Studies Bachelor of Arts Proposal Committee,
College of Arts & Sciences, University of Kentucky
- 2018-2019 Co-chair, Department of Statistics Textbook Committee,
University of Kentucky
- 2018 Session Chair, Joint Statistical Meetings,
Vancouver, Canada
- 2017 Session Chair, KBRIN Retreat, Shaker Village, Kentucky
Charlotte, North Carolina
- 2017 Session Chair, Joint Statistical Meetings,
Baltimore, Maryland
- 2016 Session Chair, Women in Statistics and Data Science Conference,
Charlotte, North Carolina
- 2016 Guest Speaker, Henry Clay High School Women in STEM Club,
Lexington, Kentucky
- 2016 Session Chair, Southern Regional Council on Statistics Summer Research
Conference, Bentonville, Arkansas
- 2015-2019 Chair, Department of Statistics Computations and Technology Committee,
University of Kentucky
- 2015-2019 Member, Department of Statistics Undergraduate Studies Committee,
University of Kentucky
- 2015 Session Chair, Joint Statistical Meetings, Seattle, Washington
- 2013-2015 Member, Department of Statistics Computing, Minutes, and Picnic Committees,
University of Kentucky
- 2012 Panelist, "Learning Technology: A Student Perspective on Education," Innovate
Conference, The Ohio State University
- 2011-2012 Co-President, Statistics Department Graduate Students, The Ohio State University
- 2011-2012 Member, Department of Statistics Communication Committee,
The Ohio State University
- 2010-2013 Volunteer, Graduate Student/Faculty Candidate Meetings, The Ohio State University
- 2009-2013 Volunteer, Graduate Student Recruitment Activities, The Ohio State University

Honors and Awards

- 2019-2020 Inclusion Fellow, College of Arts & Sciences, University of Kentucky
2018-2019 Inclusion Fellow, College of Arts & Sciences, University of Kentucky
2018 Mike Kutner Faculty Poster Session Winner, Summer Research Conference of
the Southern Regional Council on Statistics, Virginia Beach, Virginia
2018 Junior Faculty/Isolated Statistician Travel grant, Summer Research Conference of
the Southern Regional Council on Statistics, Virginia Beach, Virginia
2014 Travel Award, Women in Statistics Conference, Cary, North Carolina
2013 Craig Cooley Memorial Prize, Department of Statistics, The Ohio State University
2012-2013 Graduate Associate Teaching Award Recipient (university-wide award),
The Ohio State University
2011 Koch Travel Award, Department of Statistics, The Ohio State University
2009-2010 Thomas and Jean Powers Teaching Award for Best Teaching Associate,
Department of Statistics, The Ohio State University
2008-2009 University Fellowship Recipient, The Ohio State University
2008-2009 Battelle Fellowship Recipient, The Ohio State University
2006-2007 Gertrude Flora Ribble Research Scholar, University of Kentucky

Professional Affiliations

- 2018-Present Member, American Heart Association
2017-Present Member, Caucus for Women in Statistics
2010-Present Member, American Statistical Association