

**Education:**

- B.S. Mathematics: University of Texas at Arlington (1999)
- M.S. Biostatistics: University of Washington (2002)
- Ph.D. Biostatistics: University of Washington (2006)
  - Advisor: [John Storey](#)

**Employment:**

- Associate Department Head for Teaching Excellence: Texas A&M University, Department of Statistics (2020-present)
- Associate Professor: Texas A&M University, Department of Statistics (2011-present)
- Assistant Professor: Texas A&M University, Department of Statistics (2006-2011)
- Visiting Scientist: Pacific National Laboratory (2009)
- Intern: Los Alamos National Laboratory (2004)
- Graduate Assistant: University of Washington, Department of Biostatistics (1999-2006)

**Research:**

- *Overview:* My research program is a mix of bioinformatics methods development, statistics education, and high-impact collaborations with scientists from other fields. I was most active in methods development in the earlier portion of my career, after which I transitioned to participation in bioinformatics projects involving non-statistician collaborators, and more recently have included statistics education. My bioinformatics methods work has had substantial impact, with citations in journals including *Science*, *Nature*, *Cell*, *Proceedings of the National Academy of Sciences* and premier statistics journals including *Journal of the American Statistical Association*, *Journal of the Royal Statistical Society-Series B*, *Biometrika*, *Annals of Applied Statistics*, *Biostatistics*, and *Biometrics*. I continue to be active on all three fronts, although my current interests lie mostly with the latter two categories. I find it extremely satisfying to contribute to, in particular, collaborative high-impact research that benefits public health. I make important contributions to such projects, often involving experimental design and the analysis of high-dimensional epigenomic data. Because of my passion and skill as a teacher, I also am excited to further develop my burgeoning program of education research. I am well-prepared to substantially grow my contributions in this area due to newly-formed collaborations and plans to incorporate more student assistants.
- See my [Google Scholar](#) page or CV for a list of publications.
- Interests:
  - *Education:* This is a relatively new area for me but something I have been building toward for several years. I am primarily interested in developing methods and tools to (a) help other instructors succeed in teaching by e.g. publishing interesting real-world case studies using contemporary (and not easily-obtained) data, (b) provide diagnostic tools for predicting student success in an introductory statistics class, (c) suggest interventions for students who are struggling, and (d) train instructors of multiple sections of the same course to collaborate and deliver consistency across sections. I have published three education-focused papers

since 2020 and one in 2014. In addition, a Ph.D. student of mine is graduating this year with a dissertation involving statistics education. We have one paper in press and two papers in preparation.

- *Biostatistics and Bioinformatics*: This is where I began my career, and I am still active in this area, although my more recent work in this area has involved applications with non-statisticians. My methodological work has focused on normalization, classification, and differential expression analysis for high-dimensional -omics data (especially data from mass spectrometry-based proteomics). Almost all of my most highly cited papers are bioinformatics methods papers. I have been lead statistician on five large federal grants and was granted a large subcontract from the Pacific Northwest National Laboratory as P.I. for proteomics methods development.
- *Applications*: I have collaborated as statistician with faculty and graduate students in, for example, the National Laboratories, the TAMU Health Science Center, and the TAMU Departments of Neuroscience and Experimental Therapeutics, Genetics, Chemistry, Electrical Engineering, Biology, Entomology, Mathematics, Nutrition and Food Science, and Veterinary Pathology. Currently, I collaborate closely with faculty in the TAMU Department of Neuroscience and Experimental Therapeutics on problems aimed at understanding relationships between stroke and traumatic brain injury with Alzheimer's disease. I serve as lead statistician, and my role typically involves the analysis of high-dimensional epigenomic data. I am on active grants with faculty from this group as well as a large pending one. In addition, I am on the Scientific Advisory Board as lead statistician for a large multi-center study of stroke and the effects of stroke, involving epigenomic data.
- Collaborations:
  - Present:
    - Kentucky Neuroscience Institute
    - Klingenstein Clinical Center
    - Penumbra, Inc.
    - At TAMU:
      - Departments of Neuroscience and Experimental Therapeutics, Cell Biology and Genetics, Chemistry
      - Health Science Center
  - Past:
    - Advanta Seeds, Inc.
    - NASA
    - Pacific Northwest National Laboratory
    - University of Seychelles
    - University of Tasmania
    - At TAMU:
      - Departments of Biology, Computer Science and Engineering, Ecology and Conservation Biology, Electrical Engineering, Entomology, Health Policy and Management, Mathematics,

**Teaching:**

- *Overview:* My approach to conveying understanding to my students in the classroom is to emphasize core concepts and discuss examples that illustrate those concepts. I then expect the students to fill in details that I do not have time to cover in lectures through referencing the textbook or course notes and working through problems. It is my belief that, if a student understands the main idea of an application or method well, learning at least some of the details of its implementation through self-study and practice with real problems will develop mastery. In lectures, I try to keep students engaged by asking questions regularly, at times having them discuss topics together in small groups, and requiring them to provide information to fill in blanks in my lecture notes during lectures. I typically survey my students mid-semester to obtain feedback about how they feel the course is going and try to make adjustments accordingly. I frequently review the overall goals of the class, what we have learned so far, and how everything fits together into the overall “story.” It is also very important to me that I treat students with respect, answer all questions as well as I can without making students feel “dumb,” and show compassion and support when students experience hardship. It has been my experience that treating students this way tends to result in affected students happily working harder, perhaps because they do not want to disappoint their instructor. I have ended up being primary advisor or committee member for at least 50 students who took my classes (at each of the undergraduate, M.S., and Ph.D. levels).
- Have taught 11 courses at the undergraduate, M.S., and Ph.D. levels.
  - Student evaluations have consistently been exceptional.
- Developed 4 Statistics courses:
  - [STAT 182](#): First course for B.S. Statistics majors. Intended to give a survey of the breadth of applications for professional statisticians. Features guest speakers. Writing-intensive. Required course for B.S. Statistics students.
  - [STAT 645](#): Biostatistics course for M.S. program. I developed this course as an elective for our new Distance Learning M.S. program.
  - [STAT 646](#): Statistical Bioinformatics course for M.S. program. I developed this course as an elective for our new Distance Learning M.S. program.
  - [STAT 649](#): Professional communication for statisticians course for Ph.D. program. Required course for Ph.D. Statistics students.
- Developed a special topics course called Rational Learning through the College of Liberal Arts in 2017. The objective of this class was to use scientific and rational evidence to argue for an inclusive and compassionate worldview, with guest faculty speakers from other departments on campus, including Physics & Astronomy, Biology, Philosophy, and Psychology. I taught this above my required teaching load.
- Wrote (with a cartoonist) [The Cartoon Introduction to Statistics](#) in 2013, published by Hill and Wang. See more about this book in section **Other Scholarly Work / Media** below.
- Have won 5 TAMU teaching awards:

- [Presidential Professor for Teaching Excellence](#) (2021):
  - Two awards given each year
  - Recipients bear title for the rest of their career
- [Distinguished Achievement University-Level Award in Teaching from the Association of Former Students](#) (2017):
  - Ten awards given each year
- [Eppright Professorship in Undergraduate Teaching Excellence](#) (2016):
  - Five University Professorship for Undergraduate Teaching (UPUTE) awards given each year, but only one Eppright
  - Recipients bear title for three years
- [Distinguished Achievement College-Level Award in Teaching from the Association of Former Students](#) (2011)
  - Approximately four awards given per college each year (varies from year to year)
- [Montague-Center for Teaching Excellence Scholar](#) (2009):
  - One award given per college each year

**Service:**

- *Overview:* I have provided extraordinary service to my department. It is important to me to contribute what I can to the inner workings of the department, as I know that this is not usually the top priority of tenure-track faculty who are primarily focused on research. I strive to maintain a relatively even balance between the roles of research, teaching, and service, although I acknowledge that my contributions skew somewhat toward teaching and service. I have been encouraged that my service efforts have been supported by my department heads over the years. Through the creation of an undergraduate major, course development, mentorship of junior instructors and Teaching Assistants, and now my role as Associate Department Head for Teaching Excellence, I believe I have had an important impact on the growth of our department.
- Associate Department Head for Teaching Excellence:
  - Provide mentorship and assist with the development of junior faculty, postdoc, and graduate student instructors:
    - I visit their classrooms to observe their teaching, review their course materials, and read their course evaluations. I discuss my assessments and make suggestions for improvement.
  - Make TA assignments, train and manage the TAs, and mediate conflicts between students, TAs, and instructors.
  - Provide leadership to instructors of multi-section service courses in an effort to ensure consistency across sections.
  - Lead efforts to incorporate open-access course materials as well as data science materials.
- Development and direction of new B.S. degree in Statistics:
  - I led (together with colleague Tom Wehrly) the creation of our first undergraduate major. This included the development of a degree plan and working through the labyrinth of paperwork and bureaucracy of creating a new major. I also created a

required course for our freshman majors. I then was co-Director of the program before being promoted to Associated Department Head for Teaching Excellence. The program has grown from an initial cohort of 50 to 260. Many of our graduates have gone on to graduate programs at prestigious universities, including Stanford, Duke, UC-Berkeley, Cornell, Univ. of Washington, and Univ. of Michigan.

- Incorporation of open-access course materials:
  - Led the incorporation of open-access textbooks and homework systems for three of our large undergraduate service classes. These efforts led to savings of about \$500,000 for students in these classes per year.
- Have served on many committees:
  - Some recent examples:
    - Scientific Advisory Board, INSIGHT Study Led by Penumbra, Inc.:
      - Multi-institution study to collect data on stroke patients and evaluate the efficacy of a proprietary aspiration pump. I am lead statistician, responsible for all data analysis including epigenomic data (genotype data using SNPs, expression data using RNASeq, and proteomics data using mass spectrometry).
    - At TAMU:
      - 2023-current: Member, Committee for Approval of an American Association of Colleges and Universities Institute on Open Educational Resources
      - 2020-current: Chair, Committee for Academic and Professional Track Hiring, Department of Statistics
      - 2022-current: Member, Committee for Biomedical Informatics and Behavioral Sciences (BIBS) Program, Public Health Sciences
      - 2022-current: Member, Committee for Creation of B.S. Degree in Bioinformatics, Departments of Biology and Statistics
      - 2020-current: Chair, Committee for Teaching Excellence, Department of Statistics
      - 2020-current: Member, Executive Committee, Department of Statistics
      - 2019-current: Member, Committee for Academics, TAMU Institute for Data Science (TAMIDS)
      - 2015-current: Member, Undergraduate Program Committee, Department of Statistics

#### **Grants / Contracts:**

- [Pending] Lead statistician on a large NIH P01 grant composed of three R01-sized components and a total budget of over \$10,000,000. PI: Farida Sohrabji. Preparing for re-submission.
- DOD-Army-Medical Research Acquisition Activity: Role of B Cells and Adaptive Immunity in Exacerbated Alzheimer's Disease After Traumatic Brain Injury. PI: Lee Shapiro. Role: Co-I. Percent effort: 5%. Period of award: 2022-2025. Total award = \$756,359. The purpose

of this project is to determine the extent to which traumatic brain injury-mediated expansion of B cells leads to worsened Alzheimer's disease symptoms. My contribution is experimental design, power analysis, exploratory data analysis, and significance analysis using mixed models.

- DOD-Army-Medical Research and Materiel Command: Contribution of Thrombin Signaling to Alzheimer's Disease Pathology Following Traumatic Brain Injury. PI: Jackie Iannucci. Role: Co-I. Percent effort: unfunded. Period of award: 2022-2024. Total award = \$340,069. The purpose of this project is to determine if inhibiting thrombin activation of PAR-1 following traumatic brain injury will reduce Alzheimer's disease symptoms and cerebrovascular integrity. My contribution is experimental design, power analysis, exploratory analysis, and significance testing of a list of hypotheses using robust methods.
- TAMU Diversity Seed Grant: Enhancing Resilience and Retention: A Scalable Flipped Classroom Model for Underrepresented Undergraduates. PI: Mary Meagher. Role: Other Personnel. The purpose of this project was to evaluate the effectiveness of a 1 credit hour flipped course designed to enhance the resilience and retention of underrepresented students in Psychological & Brain Sciences. Percent effort: unfunded. Period of award: 2018-2019. My contribution was to assist with study design, analyze the collected data, and create a point-and-click tool for others to use the methods we created.
- TAMU College of Science Diversity and Equity Innovation Grant: Symposium for Junior Faculty, Graduate Students and Post Docs in the Sciences: Insights and Strategies for Professional Success, Personal Well-Being, and Getting Along with Others. PI: Derya Akleman. Role: Co-PI. Percent effort: unfunded. Period of award: 2017. Total award = \$10,000. The purpose of this project was to offer a symposium for scientists early in their career for balancing professional success with personal well-being. The team included faculty members from Biology, Mathematics and Statistics. My contribution was to help design the symposium, recruit speakers, and deliver a speech of my own.
- DHHS-NIH-National Institute on Aging: Epigenetics of the Aging Astrocyte: Implications for Stroke. PI: Farida Sohrabji. Role: Other Personnel. Awarded subcontract for which I was Principal Investigator. Percent effort: 5%. Period of award: 2012-2017. Total award = \$1,555,177 (\$42,458 for my subcontract). The purpose of this project was to test whether estrogen deficiency causes rearrangement of the epigenome and whether associated miRNAs can be manipulated as therapeutic targets for Alzheimer's disease. My contribution was to identify miRNAs that are associated with estrogen deficiency and discover involved gene networks and signaling pathways.
- USDA-National Institute of Food and Agriculture: Integrated Program for Reducing Bovine Respiratory Disease Complex in Beef and Dairy Cattle. PI: James Womack. Role: Co-PI. Percent effort: 10% in years 2 and 3. Period of award: 2011-2017. Total award = \$9,750,000. The purpose of this project was to use recent advances in genomics to reduce the prevalence of BRD in beef and dairy cattle. My contribution was to lead the analysis of gene set enrichment SNP data.
- American Cancer Society: Effects of Estrogen on Sporadic and Inflammation-Associated Colon Cancer. PI: Clinton Allred. Role: Co-I. Percent effort: 5%. Period of award: 2011-2016. Total award = \$718,000. The purpose of this project was to determine the role of

estrogen in colonic inflammation and subsequent tumor formation. My contribution was to help with experimental design, power analysis, and exploratory and inferential analysis.

- NASA-Washington: Increasing Electrocardiography (ECG) Predictive Power by Using the Random Forest. Role: PI. Percent effort: 20%. Period of award: 2011-2012. Total award = \$30,000. The purpose of this project was to develop methods for using electrocardiography to estimate the effective age of a heart. My contribution was to use health data on astronauts to develop a predictive model using random forests.
- NSF UBM Institutional: Integrated Undergraduate Research Experiences in Biological and Mathematical Sciences. PI: Jay Walton. Role: Senior Personnel. Percent effort: unpaid. Period of award: 2010-2015. Total award = \$498,895. The purpose of this project was to provide research experiences to math students using biological applications. My contribution was to advise students in the program on projects that involved statistical analysis of biology data.
- Subcontract from Pacific National Laboratory. Role: PI. Percent effort: 30%. Period of award: 2008-2010. Total award = \$350,000. The purpose of this project was to create statistical methods and tools for the analysis of mass spectrometry proteomics data. My work resulted in eight publications.

#### **Other Scholarly Work / Media:**

- [Interviewed](#) on the local College Station, TX news station KBTX to talk about the state lottery in 2017
- Featured in series of [36 professionally-produced statistics videos](#) with W.H. Freeman Publishing in 2015
- Authored (with a cartoonist) the book [Cartoon Introduction to Statistics](#) in 2013:
  - Positive reviews from *The Economist*, *Scientific American*, and *Publishers Weekly*
  - 4.5 average star review (out of 5) based on 203 reviews at Amazon
  - Featured as being on [Bill Gates's current reading list](#) in a 2013 article in *Wired Magazine*
- Led the initial development of the [qvalue R package](#) that has received a total of 1,000 citations (over several versions)

#### **Students:**

- Statistics PhD:
  - Will Boyles (2023):
    - Accepted position at Whitman College
    - Research area: Statistics Education
  - Robyn Ball (2013):
    - Computational Scientist at The Jackson Laboratory
    - Research area: Biostatistics
  - Xuan Wang (2011):
    - Statistician II at Baylor Scott & White Health
    - Research area: Bioinformatics

- Statistics Postdocs:
  - Carmen Tekwe (2011-2013):
    - Associate Professor, Indiana University Bloomington, Department of Biostatistics
    - Research area: Bioinformatics
  - Yuliya Karpievitch (2007-2010):
    - Computational Biologist, Biostatistician & AI Specialist at Telethon Kids Institute
    - Research area: Bioinformatics
- Statistics MS:
  - Have advised dozens
- Statistics UG:
  - Have advised dozens
- Non-Statistics PhD:
  - Committee member for about 30 students
- Other:
  - Mentored UG Math majors through a UBM program
  - Advised 4 UG students through the TAMU [First Year Eats program](#)
  - Mentored 5 UG students through the TAMU [College of Science mentoring program](#)

#### **Invited Talks:**

- 2023: Invited speaker at the Transformational Teaching and Learning Conference, TAMU (unable to attend)
- 2018: Invited speaker at the University of California at Irvine, Department of Statistics, Irvine, CA
- 2018: Keynote speaker at Annual Symposium of Texas Taiwanese Biotechnology Association, TAMU
- 2017: Invited speaker at Oregon State University, Department of Statistics, Corvallis, OR
- 2015, 2016 and 2017: Invited talk to high school teachers of statistics at the AP Statistics Summer Institute, TAMU, Department of Statistics
- 2016: Panelist at Pedagogy Project event for disciplines related to mathematics and the physical sciences, TAMU
- 2016: Keynote speaker at the Genetic Association of Hainan Province Life Sciences Conference, Haikou, China
- 2015: Invited talk at the Pennsylvania Conference of State Trial Judges, Hershey, PA
- 2014: Invited talk at the Joint Statistical Meetings, NISS-SAMSI Affiliate Dinner, Boston, MA
- 2010: Invited speaker at the Joint Statistical Meetings, Vancouver, British Columbia (unable to attend)
- 2009: Invited keynote speaker at the International Workshop on Statistical-Mechanical Informatics, Kyoto, Japan (unable to attend)



- 2009: Invited talk at the Summer Research Conference of the Southern Regional Council in Statistics (SRCOS), Jekyll Island, GA
- 2009: Invited talk at Department of Physics and Astronomy, TAMU
- 2009: Invited talk at the Physics of Quantum Electronics Workshop, TAMU
- 2007: Invited talk at the Pacific Northwest National Laboratory
- 2007: Invited talk at the University of California at San Francisco, Department of Biostatistics
- 2006: Invited talk at Houston ASA (HACASA) Meeting
- 2006: Invited talk at the University of Texas at Arlington, Department of Mathematics
- 2006: Job talks at:
  - Dartmouth College, Department of Statistics
  - Emory University, Department of Biostatistics
  - MD Anderson, Department of Biostatistics
  - Rice University, Department of Statistics
  - Southern Methodist University, Department of Statistics
  - Texas A&M University, Department of Statistics
  - University of Kentucky, Department of Statistics