Yuan Fang

Contact Information

Department of Pharmaceutical Sciences
School of Pharmacy and Pharmaceutical Sciences
Binghamton University
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EDUCATION

Doctor of Philosophy, Mathematical Sciences (concentration in Statistics)   August 2020
Binghamton University, Binghamton, NY
    Advisor: Dr. Sanjeena Subedi (Dang)
    Dissertation Title: "Model-based clustering approaches for non-Gaussian data"

Master of Arts, Mathematics
Binghamton University, Binghamton, NY   May 2016

Bachelor of Science, Mathematical Physics
University of Waterloo, Waterloo, ON, Canada   June 2014

EMPLOYMENT

Binghamton University
School of Pharmacy and Pharmaceutical Sciences   January 2023 - present
Department of Pharmaceutical Sciences
Assistant Professor

Binghamton University
Department of Mathematics and Statistics   January 2023 - present
Assistant Professor (by courtesy)

Boston University, School of Public Health   September 2020 - December 2022
Department of Biostatistics
Postdoctoral Associate, Supervisor: Dr. Kathryn Lunetta

PUBLICATIONS
† = corresponding author; ⋆ = student mentored

- Stanton J, Gionfriddo MR, Rattinger GB, **Fang Y**, Lussier ME. "Tools for clinical pharmacists to identify medications that can cause drug-induced cognitive impairment: A systematic review". *Journal of the American College of Clinical Pharmacy.* 2024 Dec 10. Published Online. [doi]
- Chen J, Ragab AAY, Doyle MF, Alosco ML, **Fang Y**, Mez J, Satizabal CL, Qiu WQ, Murabito JM, Lunetta KL. 2024. "Inflammatory protein associations with brain MRI measures: Framingham Offspring Cohort." *Alzheimer's & Dementia.* 2024 Sep 16. Online ahead of print.[PMID: 39282876]. [doi].
- Dai W⋆, **Fang Y**, Subedi S. "Mixtures of logistic normal multinomial regression models for microbiome data". *Journal of Applied Statistics.* 2024;1–32. [doi].
- Ragab AAY, Doyle MF, Chen J, **Fang Y**, Lunetta KL, Murabito JM. "Immune cell phenotypes and mortality in the Framingham Heart Study". *Immunity & Ageing.* 2024;21(1):37. [doi]. [PMID: 38867269].

- Chen J, Doyle MF, **Fang Y**, Mez J, Crane PK, Scollard P, ADSP Data Harmonization Consortium Cognitive Harmonization Core, Satizabal CL, Alosco ML, Qiu WQ, Murabito JM. "Peripheral inflammatory biomarkers are associated with cognitive function and dementia: Framingham Heart Study Offspring cohort". *Aging Cell.* 2023;22(10):e13955. [doi]. [PMID: 37584418].
- **Fang Y**, Subedi S. "Clustering microbiome data using mixtures of logistic normal multinomial models". *Scientific Reports.* 2023;13(1):14758. [doi]. [PMID: 37679485].
- **Fang Y**[†], Doyle MF, Chen J, Alosco ML, Mez J, Satizabal CL, Qiu WQ, Murabito JM, Lunetta KL. "Circulating Immune cell phenotypes are associated with age, sex, CMV, and smoking status in the Framingham Heart Study Offspring participants". *Aging (Albany NY).* 2023 Apr 27;15(10):3939-3966. [doi]. [PMID: 37116193].
- **Fang Y**, McDonald CM, Clemens PR, Gordish HD, Illei K, Hoffman EP, Dang UJ. "Modeling early heterogeneous rates of progression in Duchenne muscular dystrophy boys". *Journal of Neuromuscular Diseases.* 2023 Feb 14. Epub ahead of print. [doi]. [PMID: 36806514].
- **Fang Y**[†], Doyle MF, Chen J, Alosco ML, Mez J, Satizabal CL, Qiu WQ, Murabito JM, Lunetta KL. "Association between protein biomarkers and cognitive aging ". *PloS one.* 2022 Sep 9;17(9):e0274350. [doi]. [PMID: 36083988].
- **Fang Y**, Karlis D, Subedi S. "Infinite Mixtures of Multivariate Normal-Inverse Gaussian Distributions for Clustering of Skewed Data". *Journal of Classification.* 2022 Aug 23:1-43. [doi].
- **Fang Y**[†], Doyle MF, Alosco ML, Mez J, Satizabal CL, Qiu WQ, Lunetta KL, Murabito JM. "Cross-Sectional Association Between Blood Cell Phenotypes, Cognitive Function, and Brain Imaging Measures in the Community-Based Framingham Heart Study". *Journal of Alzheimer's Disease.* 2022;87(3):1291-1305. [doi]. [PMID: 35431244].

SUBMITTED

- Han J, **Fang Y**, Campbell N. "Real-World Safety Profile of Lecanemab: Disproportionality Analysis of Adverse Reactions in the FDA Adverse Event Reporting System (FAERS)". Under review at *Journal of the American Pharmacists Association.*
- Dai W[⋆], **Fang Y**[†], Subedi S. "Logistic t-multinomial Mixture Model for Clustering for Microbiome Data". Under review at *Statistical Methods & Applications.*
- **Fang Y**[†], Dang UJ, Illei K, Clemens PR, and Hoffman EP. "Association of *DMD* gene variant classes with motor outcomes in a drug registration clinical trial setting". Under review at *Neurology: Genetics.*
- **Fang Y**[†], Chen J, Doyle MF, Mez J, Alosco ML, Satizabal CL, Qiu WQ, Murabito JM, Lunetta KL. "Modeling heterogeneity in cognitive trajectories in the Framingham Heart Study". Under review at *Frontiers in Aging Neuroscience.*

IN PREPARATION

- **Fang Y**, Subedi S, Franczak B. "Bayesian parameter estimation for mixtures of shifted asymmetric Laplace distributions"
- **Fang Y**, Chen J, Murabito JM, Lunetta KL. "Evaluation of latent-class mixed-effect models for trajectory clustering in complex data sets through simulation studies"

PRESENTATIONS

ORAL PRESENTATIONS

- "Clustering microbiome data using mixtures of logistic normal multinomial models", 2024 Joint Statistical Meetings, Portland, OR (August 2024). ***Invited*** *to a topic contributed session.*
- "A robust logistic *t*-multinomial mixture model for clustering microbiome data", The Classification Society 2024 Annual Meeting, Kelowna, BC, Canada (June 2024).
- "Clustering microbiome data using mixture of logistic normal multinomial models", The Classification Society 2023 Annual Meeting, Rochester, NY, USA (June 2023).

- "Modeling heterogeneity in cognitive trajectories in the Framingham Heart Study", Monthly Scientific Progress in FHS-BAP, Pilot Grant Recipient (2022-2023) talk, Boston University, online (March 2023).
- "Clustering disease trajectories: statistical method applications and evaluation", Data Science Seminar, Department of Mathematics and Statistics, Binghamton University, Binghamton, NY (Feb 2023). ***Invited***.
- "Evaluation of latent-class mixed-effect models for trajectory clustering in complex data sets through simulation studies", Statistics Seminar, School of Mathematics and Statistics, Carleton University, online (Nov 2022). ***Invited***.
- "Mixtures of logistic-normal multinomial regression models for microbiome data", Statistics Seminar, Department of Mathematics & Statistics, Texas Tech University, online (Oct 2022). ***Invited***.
- "Evaluation of latent-class mixed-effect models for trajectory clustering in complex data sets through simulation studies", 2022 Joint Statistical Meetings, Washington, D.C. (Aug 2022).
- "Patterns of cognitive trajectories in the Framingham Offspring Study - some preliminary analysis", Biostatistics Seminar Series, Boston University, Department of Biostatistics (Sep 2021).
- "Bayesian infinite mixtures of multivariate normal-inverse Gaussian distributions for clustering of skewed data", Fields CQAM Focus Program on Data Science and Optimization, Conference on Data Science, Toronto, Canada (Nov 2019). ***Invited***.
- "Bayesian infinite mixtures of multivariate normal-inverse Gaussian distributions for clustering of skewed data", 2019 American Mathematical Society Fall Eastern Sectional Meeting, Binghamton, NY (Oct 2019). ***Invited***.
- "Bayesian approach to parameter estimation and clustering for the mixtures of multivariate normal-inverse Gaussian distributions", Statistics Seminar, Binghamton University Department of Mathematical Sciences (April 2018).
- "Bayesian estimation for the multivariate normal-inverse Gaussian model", 2017 Joint Statistical Meetings, Baltimore, MD (Aug 2017).

POSTERS
- "Impact of immigration timing on medication non-adherence and cognitive function in older adults", The Gerontology Society of America 2024 Annual Scientific Meeting, Seattle, WA (Nov 2024).
- "Modeling heterogeneity in cognitive trajectories in the Framingham Heart Study", The Gerontology Society of America 2023 Annual Scientific Meeting, Tampa, FL ([doi], Nov 2023).
- "Effect of DMD gene mutation classes on baseline and drug response motor outcomes: Studies in the vamorolone trials", 6th International Conference on Neuromuscular Disease and Biology, Ottawa, ON, Canada (September 2023)
- "Modeling early heterogeneity in progression in boys with Duchenne muscular dystrophy", 2023 Muscular Dystrophy Association Clinical & Scientific Conference, online March 2023).
- "Immune cell phenotypes in the Framingham Heart Study Offspring participants", The Gerontology Society of America 2022 Annual Scientific Meeting, Indianapolis, IN ([doi], Nov 2022).
- "Association of inflammatory proteins with cognitive aging, brain MRI markers, and incident dementia", 2022 Alzheimer's Association International Conference, online (Aug 2022).
- "Association of blood cell phenotypes of peripheral pnflammation with brain imaging measures", The Gerontology Society of America 2021 Annual Scientific Meeting, online ([doi], Nov 2021).
- "Cross-sectional asociation of blood cell phenotypes of peripheral inflammation with cognitive functioning ", 2021 Alzheimer's Association International Conference, online ([doi], July 2021).
- "A Bayesian approach to parameter estimation and clustering of skewed data using mixtures of multivariate normal-inverse Gaussian distributions", Binghamton University Research Days Poster Session (Poster presentation April 2019).

GRANTS AND AWARDS

<u>EXTRAMURAL</u>

Foundation to Eradicate Duchenne   01/01/25 - 12/31/25
Role: PI $29,500
"Understanding the molecular basis for corticosteroids efficacy in DMD: Identifying partial correlation network across lipidomic, proteomic, and motor function profiles using Vamorolone VBP15-004 clinical trial data."

Foundation to Eradicate Duchenne   01/01/23 - 12/31/23 (extended to 12/31/24)
Role: PI $27,500
"Multi-omics analyses of lipidomics, proteomics, and mRNA profiles in Duchenne Muscular Dystrophy"

<u>INTERNAL</u>

Binghamton University
Transdisciplinary Areas of Excellence Seed Grant: Data Sciences   06/01/24 - 05/31/25
Role: Co-I (PI: Emery) $14,996.65
"Rural Romans: Modeling the Mobility of Ancient Romans Using Biomolecular, Bioarcheological, and Machine Learning Techniques"

Binghamton University
Transdisciplinary Areas of Excellence Seed Grant: Health Sciences 06/01/23-05/31/24 (extended to 05/31/25)
Role: Co-I (PI: Lussier) $14,997
"Understanding How Clinicians Consider Medication Risks in Patients at Risk for Cognitive Decline"

2022 Boston University FHS-BAP pilot grant
NIA U19-AG068753 sub-project   04/01/22-03/31/23
Role: PI $25,000
"Modeling heterogeneity in cognitive trajectories in the Framingham Heart Study"

SOFTWARE AND PROGRAMMING SKILLS

<u>R Package</u>

- **LNMVGA**: Mixture of logistic-normal multinomial models for clustering microbiome data
  Github link: <https://github.com/yuanfang90/LNMVGA>

<u>Programing Skills</u>

R, Python, Linux, SAS, MATLAB.

TEACHING EXPERIENCE

Course Coordinator, Instructor   Spring 2023,2024
PHRM 511/PHSC 611: Biostatistics
    Institute: School of Pharmacy and Pharmaceutical Sciences, Binghamton University.
    Outlines: descriptive statistics, inferential statistics, hypothesis testing, non-parametric methods,
               simple and multivariable regression methods, and survival analyses.

Course Coordinator, Instructor	Fall 2023, 2024

PHRM 514: Pharmaceutical Calculations
    Institute: School of Pharmacy and Pharmaceutical Sciences, Binghamton University.

Instructor	Fall 2023, 2024

PHSC 680A: Advanced Genomics and Proteomic Approaches
    Institute: School of Pharmacy and Pharmaceutical Sciences, Binghamton University.

Co-organizer	Fall 2024

MATH 567: Seminar in Statistics
    Institute: Department of Mathematics and Statistics, Binghamton University.

Teaching Experience during PhD Training

Teaching Assistance	Spring 2019, 2020

PHRM 511: Biostatistics
PHRM 515: Pharmaceutics II: Dosage Forms and Drug Delivery
    Institute: School of Pharmacy and Pharmaceutical Sciences, Binghamton University.

Instructor (Online)	Summer 2019, Winter 2020

MATH 329: Introduction to Scientific Computing
    Institute: Department of Mathematics and Statistics, Binghamton University.

Teaching Assistance	Fall 2019

PHRM 501: Foundations I: Pharmaceutical Sciences
PHRM 514: Pharmaceutical Calculations
    Institute: School of Pharmacy and Pharmaceutical Sciences, Binghamton University.

Instructor	Spring 2017, Fall 2018

MATH 226: Integration Techniques(Calculus II)
MATH 227: Infinite Series (Calculus II)
    Institute: Department of Mathematics and Statistics, Binghamton University.

Instructor	Fall 2016, Spring 2017, Spring 2018

MATH 224: Differential Calculus (Calculus I)
MATH 225: Integral Calculus (Calculus I)
    Institute: Department of Mathematics and Statistics, Binghamton University.

Instructor	Fall 2017

MATH 220: Calculus for Business and Management
    Institute: Department of Mathematics and Statistics, Binghamton University.

Teaching Assistance	Fall 2015, Spring 2016

MATH 327: Probability with Statistical Methods
    Institute: Department of Mathematics and Statistics, Binghamton University.

Teaching Assistance	Spring 2015

MATH 130: Mathematics in Action
    Institute: Department of Mathematics and Statistics, Binghamton University.

MENTORSHIP EXPERIENCE

Binghamton University	January 2023 – Present

- Thesis committee chair of 1 Ph.D. student in Statistics [co-mentored with Dr. Sanjeena Subedi (Dang)]
- Thesis committee member of 3 Ph.D. students in Pharmaceutical Sciences

- Research capstone project mentor for 4 Pharm.D. students
- Academic advisor for 6 Pharm.D. students
- Research project mentor for 2 undergraduate students
- Research mentor of 1 PGY1 (Postgraduate Year 1) Pharm.D. resident [joint with the Hackensack Meridian Health (HMH)]

Boston University   September 2020 – December 2022
Assisted mentoring 1 Ph.D. student, 1 M.S. student.

PROFESSIONAL EXPERIENCE

Binghamton University / Carleton University   May 2020 - June 2022
Research Assistant / Collaboration, PI: Dr. Utkarsh Dang
- Model trajectories of motor performance in Duchenne Muscular Dystrophy using both natural history data and clinical trials data.

Binghamton University, Teaching Online Certification Program   January – May 2019
Online Course Developer
- Reorganize an existing course and extend it to fit online instructing structure.
- Record lecture videos, include engaging course content and activities, and design assessments for the course that are suitable online.

Binghamton University   January – May 2017
Statistical Consultant
- Provide statistical consultations on study designs, analysis methods, and results interpretations to faculty, research staff, and graduate students in all departments of Binghamton University.

ACADEMIC SERVICE OUTSIDE UNIVERSITY
Ad-hoc Editor

Associate Editor, Journal of Alzheimer's Disease   January 2023 – December 2023

Ad-hoc Journal and Conference Reviewers

Gerontological Society of America's 2024 Annual Scientific Meeting Abstracts	April 2024
Neurobiology of Aging	March 2024
Frontiers in Aging Neuroscience	November 2023
Scientific Reports	August 2023
Aging (Albany NY)	May 2023
Journal of Computational and Graphical Statistics	May 2023
PLOS Computational Biology	December 2022
Statistics and Computing	April 2022
Annals of the New York Academy of Sciences	April 2022

Professional Society Memberships

Eastern North American Region of the International Biometrics Society	August 2024 – Present
American Association of Colleges of Pharmacy	January 2023 – Present
Gerontological Society of America	November 2020 – Present
The Classification Society	September 2016 – Present