Kathleen M. Storey

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Education

University of Minnesota, Minneapolis, MN

Ph.D. in Mathematics, June 2018
Advisor: Jasmine Foo

M.S. in Mathematics, January 2016

Carleton College, Northfield, MN

B.A. *magna cum laude*, Mathematics, Distinction in Major, June 2012

Employment

Lafayette College, Easton, PA

Assistant Professor (July 2021 - present)

University of Michigan, Ann Arbor, MI

Post-doctoral Assistant Professor (August 2018 - June 2021)

Research Interests

Applications of mathematics to biology and medicine (evolutionary cancer modeling, applied probability and stochastic processes, dynamical systems, topological data analysis)

Publications

1. E.J. Amézquita, F. Nasrin, **K.M. Storey**, M. Yoshizawa, 'Genomics Data Analysis via Spectral Shape and Topology,' *submitted*.

2. H. Cho*, A.L. Lewis*, **K.M. Storey***, H.M. Byrne, 'Designing experimental conditions to use the Lotka-Volterra model to infer tumor cell line interaction types,' *in revision*.
* indicates equal contribution

3. J. Foo, E.B. Gunnarsson, K. Leder, **K.M. Storey**. 'Spread of premalignant mutant clones and cancer initiation in multilayered tissue,' *accepted*, to appear in Annals of Applied Probability (2022).

4. J. Alvarez, **K.M. Storey**, P. Kannan, H. Cho. 'Effective dose fractionation schemes of radiotherapy for prostate cancer,' *Spora: A Journal of Biomathematics* (2022) 8: p. 16–30.

5. **K.M. Storey**, T.L. Jackson. 'An agent-based model of combination oncolytic viral therapy and anti-PD-1 immunotherapy reveals the importance of spatial location when treating glioblastoma,' *Cancers* (2021) 13(21), 5314, https://doi.org/10.3390/cancers13215314.

6. H. Cho*, A.L. Lewis*, **K.M. Storey***, R. Jennings, B. Shtylla, A.M. Reynolds, H. Byrne. 'A Framework for Performing Data-Driven Modeling of Tumor Growth with Radiotherapy Treatment,' *Springer Special Issue: Using Mathematics to Understand Biological Complexity, Association for Women in Mathematics Series 22* (2021).
   * indicates equal contribution

7. H. Cho*, A.L. Lewis*, **K.M. Storey***. 'Bayesian information-theoretic calibration of radiotherapy sensitivity parameters for informing effective scanning protocols in cancer,' *Journal of Clinical Medicine* (2020) 9(10), 3208, https://doi.org/10.3390/jcm9103208.
   * indicates equal contribution

8. **K.M. Storey**, S.E. Lawler, T.L. Jackson. 'Modeling oncolytic viral therapy, immune checkpoint inhibition, and the complex dynamics of innate and adaptive immunity in glioblastoma treatment,' *Frontiers in Physiology* (2020) 11: 151. doi: 10.3389/fphys.2020.00151.

9. D. Bhaskar, A. Manhart, J. Milzman, J.T. Nardini, **K.M. Storey**, C.M. Topaz, L. Ziegelmeier. 'Analyzing Collective Motion with Machine Learning and Topology,' *Chaos: An Interdisciplinary Journal of Nonlinear Science* (2019) 29(12): 123125, https://doi.org/10.1063/1.5125493.

10. **K. Storey**, A. Hawkins-Daarud, K. Leder, K. Swanson, A. Ahmed, R. Rockne, J. Foo. 'Glioblastoma recurrence and the role of O^6-Methylguanine-DNA Methyltranferase promoter methylation,' *JCO Clinical Cancer Informatics* (2019) 3: p. 1–12.

11. **K. Storey**, M. Ryser, K. Leder, J. Foo. 'Spatial measures of genetic heterogeneity during carcinogenesis,' *Bulletin of Mathematical Biology* (2017) 79(2): p. 237-276.

12. X. Wang, J.R. Walton, R.D. Parshad, **K. Storey**, M. Boggess. 'Analysis of the Trojan Y-Chromosome eradication strategy for an invasive species,' *Journal of Mathematical Biology* (2014) 68(7): p. 1731-1756.

Honors and Awards

- Completion of the Lafayette Inclusive Instructors Academy (Spring 2022)
- Project NExT Fellow (Gold '21 Cohort)
- AWM Funding for WIMB workshop: Funding for a virtual follow-up meeting for our research group (June 2021)
- The B. Alan Taylor Outstanding Postdoctoral Teaching Award, University of Michigan Department of Mathematics (2019–2020)
- Travel support for a short-term visit to NIMBioS: follow-up collaboration after participation in the 2019 ICERM Workshop of Applied Mathematical Modeling with Topological Techniques, Knoxville TN (August 2020)*
  *postponed, due to COVID-19
- "AMS MRC Collaboration Travel Support," MRC Grant from the NSF under Grant Number DMS 1641020: Support for a follow-up collaboration after participation in the 2018 MRC conference on Agent-Based Modeling (June 2019)
- Honored Instructor, University of Michigan (2018–2019)

- Travel support from the NSF and IMA to attend the *Conference on Multiscale Modeling in Mathematical Biology*, University of Minnesota (May 2019)
- SIAM Travel Award to attend the SIAM Annual Meeting, Pittsburgh, PA (July 2017)
- Travel support from the NSA to attend the AWM Research Symposium, UCLA (April 2017)
- Semester Research Assistantship, University of Minnesota (Fall 2014–Fall 2015, Spring 2017)
- Summer Research Assistantship, University of Minnesota (Summer 2015, 2016)
- NSF Travel Support used to attend the *Workshop in Stochastic Dynamical Systems in Biology* at the Newton Institute, Cambridge, UK (January 2016)
- Ella Thorpe Fellowship, University of Minnesota School of Mathematics (2012–2015)
- MBI Travel grant to attend the Ecology and Evolution of Cancer Workshop (2014)
- Honorable Mention, NSF Graduate Research Fellowship (2012)

Selected Talks

- MAA MathFest 2022, Invited Paper Session: Trends in Mathematical and Computational Biology, Philadelphia, PA (August 2022)
- SIAM Conference on the Life Sciences, Minisymposium: Modeling Immune-Checkpoint Inhibition to Improve Immuno-Oncology, Pittsburgh, PA (July 2022)
- University of Pennsylvania Mathematical Biology Seminar (April 2022)
- Texas Tech Biomathematics Seminar, virtual (March 2022)
- Villanova University Mathematics Colloquium, Villanova, PA (February 2022)
- SMB 2021 Annual Meeting, Minisymposium: WiMB: Mathematical Modeling and its Application (June 2021).
- Center for Computational Oncology Seminar Series, University of Texas at Austin (April 2021)
- AMS/MAA Joint Math Meetings, Special Session: Women Advancing Mathematical Biology Through Computational and Analytical Techniques (January 2021)
- SIAM Conference on the Life Sciences, Minisymposium: Model calibration and uncertainty quantification of cancer treatment models, Garden Grove, CA (June 2020)*
  *canceled due to COVID-19
- AMS/MAA Joint Math Meetings, Special Session: Utilizing Mathematical Models to Understand Tumor Heterogeneity and Drug Resistance, Denver, CO (January 2020)
- Michigan Math and Science Scholars Summer Course, Ann Arbor, MI (July 2019)
- SIAM Great Lakes Section Meeting, Special Session: Mathematical Biology, Ann Arbor, MI (April 2019)
- AMS/MAA Joint Math Meetings, Baltimore, MD (January 2019)
- UM Applied and Interdisciplinary Mathematics Seminar, Ann Arbor, MI (November 2018)

- 2018 SIAM Conference on the Life Sciences, Minneapolis, MN (August 2018)
- IMA Workshop for Women in Mathematical Biology, Minneapolis, MN (May 2018)
- Probability Seminar, University of Minnesota (April 2018)
- Women in Math Intro to Research Seminar, University of Minnesota (December 2017)
- 2017 SIAM Annual Meeting, Minisymposium, Pittsburgh, PA (July 2017)
- SMP-GEM Workshop, AMS/MAA Joint Math Meetings, Atlanta, GA (January 2017)
- Math Biology Seminar, University of Minnesota (July 2016)
- AMS/MAA Joint Math Meetings, Boston, MA (January 2012)

Teaching Experience

Instructor, Lafayette College, 2021-present
Math 162: Calculus II, Math 263: Calculus III, Math 282: Techniques of Mathematical Modeling, Math 301: Case Studies in Mathematical Modeling

Instructor, University of Michigan, 2018-2021
Math 216: Differential Equations, Math 404: Intermediate Differential Equations and Dynamics, Math 463: Mathematical Modeling in Biology

Instructor, University of Minnesota, 2014-2016
Math 1271: Calculus I, Math 1272: Calculus II

Teaching Assistant, University of Minnesota, 2012-2016
Math 1271: Calculus I, Math 1272: Calculus II, Math 2243: Linear Algebra and Differential Equations, Math 3283: Sequences, Series, and Foundations (Introductory proof-writing)

Research Advising

- Advisor for two Independent Study students, Lafayette College (Fall 2022)
- Faculty advisor for a group project in the Lab of Geometry at Michigan, LoG(M) (Winter semester 2021)
- Research Group Facilitator: ICERM Workshop on Applied Mathematical Modeling with Topological Techniques, (Summer 2019), and continued follow-up work.
- Mentor for Haoyue Feng, Undergraduate Research Opportunities Program, University of Minnesota (Summer 2018)

Posters

- *A Framework for Performing Data-Driven Modeling of Tumor Growth with Radiotherapy Treatment*, SIAM Conference on Computational Science and Engineering, Minisymposterium: Verification, Validation, and Uncertainty Quantification in the Medical Sciences (March 2021).

- *The dynamics of innate and adaptive immunity in response to oncolytic viral therapy*, Multiscale Modeling in Biology Conference, University of Minnesota (May 2019)
- *Glioblastoma recurrence and the role of MGMT promoter methylation*, 2018 Neuro-Oncology Symposium, University of Minnesota (May 2018)
- *Spatial measures of genetic heterogeneity during carcinogenesis*, AWM Research Symposium, UCLA (April 2017)
- *Spatial heterogeneity during epithelial carcinogenesis*, Stochastic Dynamical Systems in Biology: Opening Workshop, Newton Institute, Cambridge, UK (January 2016)

Recent Service Activities

- Co-director of the Kovalevsky Society, a mentoring program for female and non-binary students in the Mathematics Department at Lafayette College (2022–present)
- AMS Notices Early Career Section Intern (August 2021–present)
- Triage Judge for the COMAP Mathematical Contest in Modeling (2022)
- Reviewer for *Mathematical Biosciences and Engineering*, *PLOS Computational Biology*, *Cancers*, *Scientific Reports*.
- Minisymposium co-organizer, "Women in Mathematical Biology: Mathematical Modeling and its Application," SMB 2021 Annual Meeting (June 2021)
- Special Session Organizer, "Women Advancing Mathematical Biology Through Computational and Analytical Techniques," Joint Math Meetings, (upcoming, January 2021)
- Minisymposium co-organizer, "Women in Mathematical Biology: Recent advances in the field," SIAM Conference on the Life Sciences (June 2020)*
  *virtual due to COVID-19
- Graduate student mentor, Postdoc-Grad Mentorship Program, University of Michigan (2019–2020)
- Research Group Facilitator, ICERM Workshop of Applied Mathematical Modeling with Topological Techniques (August 2019)
- Session Leader, Michigan Math Circle for middle school students, Ann Arbor MI (Spring 2019)
- Poster Judge, MAA Undergraduate Poster Symposium, Joint Math Meetings (January 2019)
- PhD admissions reviewer, University of Michigan (2018–2019)
- Volunteer teaching assistant in Middle School Mathematics, Math Mondays in Ypsilanti, Ypsilanti MI (2018–2020)
- Undergraduate mentor, AWM Student Chapter, University of Minnesota (2017–2018)
- Peer mentor for incoming graduate students, University of Minnesota (2017–2018)
- Co-organizer, Seminar in Undergraduate Mathematics Education (2014–2015, 2017–2018)
- Volunteer Teaching Assistant, STEM summer camp for high school girls: *Mathematics in Biology*

and Medicine, University of Minnesota (Summer 2016, 2017)

- Vice President, AMS Student Chapter, University of Minnesota (2014–2015)

Other Employment

- Teaching workshop leader: Mathematics Department Graduate Student Orientation, University of Minnesota (Summer 2017)
- Homework grader, Math 8651 Theory of Probability, University of Minnesota (Fall 2015)
- Workshop leader, IMA-MathCEP math modeling camp for high school students (Summer 2015)
- REU participant, Mathematical Biology/Ecology/Physiology at Texas A&M University (Summer 2011)
- Summer Mathematics Program for Women participant, Carleton College (Summer 2010)

Professional Memberships

American Mathematical Society

Association for Women in Mathematics

Society for Industrial and Applied Mathematics

Society for Mathematical Biology

Mathematical Association of America

Technical skills

Programming languages: MATLAB, R, Python, C/C++