

Kathryn G. Link

Krener Assistant Professor
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RESEARCH INTERESTS *Applied mathematics, mathematical biology, dynamical systems, fluid dynamics, porous media, undulatory motion, flagellar dynamics, blood clotting, innate immunity*

EDUCATION University of Utah, Salt Lake City, UT
Ph.D., Mathematics 2020
Advisor: Aaron L. Fogelson, Ph.D.
Bryn Mawr College, Bryn Mawr, PA
B.A., Mathematics 2012
Advisors: Victor Donnay, Ph.D. and Sean Lavery, Ph.D.

- PUBLICATIONS & PREPRINTS**
10. C.K. Buhler, R.S. Terry, [K.G. Link](#), and F.R. Adler. “When does adaptive therapy work? Comparing cancer treatment strategies across mathematical models and outcome objectives.” *Mathematical Biosciences and Engineering*, 18.5 (2021): 6305-6327. <https://doi.org/10.3934/mbe.2021315>.
 9. [K.G. Link](#), N.A. Danes, M.G. Sorrells, K. Leiderman, K.B. Neeves, A.L. Fogelson. “A mathematical model of platelet aggregation in an extravascular injury under flow.” *Multiscale Model. Simul.*, 2020;18(4), 1489–1524. <https://doi.org/10.1137/20M1317785>.
 8. [K.G. Link](#), M. T. Stobb, D. M. Monroe, A. L. Fogelson, K.B. Neeves, S.S. Sindi, and K. Leiderman. “Computationally Driven Discovery in Coagulation.” *Arterioscler Thromb Vasc Biol.* 2020;40:00–00. <https://doi.org/10.1161/ATVBAHA.120.314648>.
 7. [K.G. Link](#), M.T. Stobb, M.G. Sorrells, M. Bortot, K. Ruegg, M. J. Manco-Johnson, J.A. Di Paola, S.S. Sindi, A.L. Fogelson, K. Leiderman, K.B. Neeves, “A mathematical model of coagulation under flow identifies factor V as a modifier of thrombin generation in hemophilia A. *J Thromb Haemost.* 2020;18(2):306-317. <https://doi:10.1111/jth.14653>.
 6. [K.G. Link](#), M.T. Stobb, J.A. Di Paola, K.B. Neeves, A.L. Fogelson, S.S. Sindi, K. Leiderman, “A local and global sensitivity analysis of a mathematical model of coagulation and platelet deposition under flow.” *PLOS ONE* (2018), 13(7): e0200917. <https://doi.org/10.1371/journal.pone.0200917>.
 5. H.T. Banks, S. Hu, [K. Link](#), E.S. Rosenberg, S. Mitsuma, and L. Rosario, “Modeling Immune Response to BK Virus Infection and Donor Kidney in Renal Transplant Recipients.” *Inverse Problems in Science & Engineering* (2016), 24(1): 127-152. <https://doi.org/10.1080/17415977.2015.1017484>.
 4. H.T. Banks, B.E. Banks, [K. Link](#), J.A. Rosenheim, C. Ross, and K.A. Tillman, “Model Comparison Tests to Determine Data Information Content.” *Applied Mathematical Letters* (2015), 43, 10-18, <https://doi.org/10.1016/j.aml.2014.11.002>.
 3. H.T. Banks, D.F. Kapraun, [K.G. Link](#), W.C. Thompson, C. Peligero, J. Argilaguuet, A. Meyerhans, “Analysis of Variability in Estimates of Cell Proliferation Parameters for Cyton-Based Models Using CFSE-Based Flow Cytometry Data.” *Journal of Inverse and Ill-posed Problems* (2014), 23(2) 135-171, <https://doi.org/10.1515/jiip-2013-0065>.

2. T. Huffman, [K. Link](#), J. Nardini, L. Poag, K. Flores, H.T. Banks, B. Blasco, J. Jungfleisch, J. Diez, “A Mathematical Model of RNA3 Recruitment in the Replication Cycle of Brome Mosaic Virus.” *International Journal of Pure and Applied Mathematics* (2013), 89(2) 251-274, <https://doi.org/10.12732/ijpam.v92i1.3>.
1. H.T. Banks, S. Hu, M. Joyner, A. Broido, B. Canter, K. Gayvert, [K. Link](#), “A comparison of computational efficiencies of stochastic algorithms in terms of two infection models.” *Mathematical Biosciences & Engineering* (2011), 9(3) 487-526. <https://doi.org/10.3934/mbe.2012.9.487>.

FELLOWSHIPS AND AWARDS

Mathematical Sciences Postdoctoral Research Fellowship: Multiscale Modeling and Simulation of Flagellar Movement (PI)

- Sponsor: National Science Foundation (DMS 1502851)
- Duration: 7/1/2021–6/30/2024
- Award amount: \$150,000

AWM Dissertation Award, \$500 2020

NSF RTG Fellow (RTG-1148230), University of Utah 2014-2015, 2019

Travel Awards:

NSF-RTG Travel Grant for SIAM Northern States Session 2019

ISTH Early Career Travel Grant 2019

IMA Workshop for Women in Mathematical Biology Travel Grant 2018

SELECTED TALKS & POSTERS

Invited Talks:

Flagellar Waveforms in Viscoelastic Fluids and their Emergent Properties.

Joint Mathematics Meetings (JMM) January 2022

AWM Special Session on Women in Mathematical Biology

Emergent Properties of Flagellar Waveforms in Viscoelastic Fluids

SMB MS09-MFBM July 2021

Emergent behavior across scales: locomotion, mixing, and collective motion in active swimmers

Platelet plug formation in flow-mediated extravascular blood clotting.

SIAM Life Sciences MS81 June 2020

Selected Contributed Talks & Posters:

A Mathematical Model of Platelet Accumulation in an Extravascular Injury with Force-Mediated Bond Formation and Breaking.

SIAM Annual Meeting July 2020

AWM Workshop Poster Session

Platelet Plug This Hole: A mathematical model of flow-mediated platelet accumulation in an extravascular injury.

JMM AMS Contributed Paper Session January 2020

A reduced order mathematical model of platelet aggregation in an extravascular injury and the effects of soluble agonist-dependent platelet activation.

SIAM Northern States Annual Meeting September 2019

A mathematical model of flow-mediated coagulation identifies FV as a modifier of thrombin generation in hemophilia A.

ISTH 2019 Congress July 2019

A Model of Flow-Mediated Platelet Accumulation in an Extravascular Injury.

GRS/GRC Hemostasis July 2018

Waterville Valley, NH

RESEARCH MENTORSHIP

Undergraduate Research Mentorship

2018-present

- *Project Title: Mathematical Modeling of Swimming.* UC Davis Summer REU 2021. Students developed computational methods that solve the equations that describe the coupled mechanics of active swimmers with the surrounding fluids. The project resulted in a manuscript in preparation.
- *Project Title: Mathematical modeling of the rumen and enteric fermentation.* Katarina Merk is scheduled to graduate with a B.S. in Mathematics from the University of California, Davis and is planning on an honors thesis submission.
- *Project Title: The role of tissue-factor pathway inhibitor (TFPI) isoforms in blood clotting models.* Belle Barnes completed her honors thesis and graduated in December 2020 with a B.S. in Mathematics from the University of Utah.
- *Project Title: Mathematical Modeling of Adaptive Therapy in Prostate Cancer.* Cassie Buhler graduated in May 2019 with a B.S. in Mathematics from the University of Utah. She is currently a graduate student in Business Analytics at Drexel University. This work resulted in a recent publication.

TEACHING

Taught a range of undergraduate math courses as **instructor of record**.

- Spring 2021: [Ordinary Diff Equations](#), [MAT 119B, UC Davis, 40 students]
- Winter 2021: [Applied Linear Algebra](#), [MAT 167, UC Davis, 70 students]
- Summer 2019: [Online Trigonometry](#), [Math 1060, U. Utah, 40 students]
- 2015 - 2016: [Business Algebra](#) [Math 1090, U. Utah, 60 students]

SERVICE

Symposium Organizer

- Special Session: Recent advances in mathematical biology.
2022 AWM Research Symposium July 2022
- Mini-Symposium: The versatility of mathematical modeling in biology: from proposing mechanism to validating hypotheses.
SIAM Northern States Annual Meeting September 2019

UC Davis Departmental Activities

2020-present

- Mathematical Biology Seminar Organizer/Moderator, AWM Mentor

Journal Referee

2019-present

- Int J Numer Method Biomed Eng, Bull. Math. Biol, Curr. Opin. Biomed. Eng.

WORKSHOPS

WPI STEM Faculty Launch

October 2019

Invited Participant

Worcester Polytechnic Institute, Worcester, MA

IMA Workshop for Women in Mathematical Biology

March 2018

Presenter and Participant

COMPUTER SKILLS

Languages & Software: [Python](#), [Fortran](#), [Matlab](#), [R](#), [XPP](#), [Jupyter Notebook](#), [Mathematica](#), [Maple](#), [LaTeX](#).

Operating Systems: macOS, Linux.