Jana L. Gevertz

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PROFESSIONAL APPOINTMENTS

ASSOCIATE PROFESSOR — August 2014 - present
The College of New Jersey (TCNJ)
Department of Mathematics & Statistics

VISITING RESEARCHER — July 2015 - August 2017
Rutgers University
Department of Mathematics

ASSISTANT PROFESSOR — August 2009 - July 2014
The College of New Jersey (TCNJ)
Department of Mathematics & Statistics

RESEARCH ASSISTANT — September 2004 - June 2009
Princeton University
Program in Applied and Computational Mathematics

RESEARCH INTERN — Summer 2007
Merck & Co., Inc.
Applied Computer Science and Mathematics Division

EDUCATION

PH.D. IN APPLIED AND COMPUTATIONAL MATHEMATICS — June 2009
Princeton University
Dissertation: Growing Heterogeneous Tumors in Silico
Advisor: Dr. Salvatore Torquato

M.A. IN APPLIED AND COMPUTATIONAL MATHEMATICS — October 2006
Princeton University

B.A. IN MATHEMATICS — May 2004
Rutgers University, Honors Program
Minor in Biology; Graduation with Highest Honors

RESEARCH INTERESTS

I broadly work in the field of mathematical biology, aiming to use tools from applied and computational mathematics to untangle the complexities of biological systems. The majority of my research pursuits focus on studying how tumor behavior arises from the many complex and interconnected components that contribute to cancer, and to better understand tumor response to anti-cancer therapeutics.

I also have a strong interest in deeply engaging undergraduate mathematical biology experiences, both in the classroom and in intensive research experiences.

AWARDS AND HONORS

- Henry L. Alder Award for Distinguished Teaching by a Beginning College or University Mathematics Faculty Member, Conferred by the Mathematical Association of America, 2016

- Distinguished College or University Teaching of Mathematics Award, Conferred by the New Jersey Section of the Mathematical Association of America, 2016
- Project NExT (New Experiences in Teaching) Fellow, 2009 - 2010
- McGraw Center for Teaching and Learning (of Princeton University) Graduate Fellow, 2008
- NSF Graduate Research Fellow, 2005 - 2009
- Burroughs Wellcome Fellow for Graduate Training in Biological Dynamics, 2004 - 2009
- Phi Beta Kappa, 2003
- Golden Key International Honors Society, 2002
- National Society of Collegiate Scholars, 2001

PUBLICATIONS

*Indicates undergraduate co-author

Mathematical/Computational Biology (Refereed)

- S. Barish*, M.F. Ochs, E.S. Sontag and **J.L. Gevertz**, 2017. Evaluating optimal therapy robustness by virtual expansion of a sample population, with a case study in cancer immunotherapy. *Proceedings of the National Academy of Sciences* **114**(31): E6277-E6286.
- A.B. Shah*, K.A. Rejniak and **J.L. Gevertz**, 2016. Limiting the development of anti-cancer drug resistance in a spatial model of micrometastases. *Mathematical Biosciences and Engineering* **13**(6): 1185-1206.
- **J.L. Gevertz** and C. Wang, 2016. Finding causative genes from high-dimensional data: an appraisal of statistical and machine learning approaches. *Statistical Applications in Genetics and Molecular Biology* **15**(4): 321-347.
- J.R. Wares, J.J. Crivelli, C.O. Yun, I.K. Choi, **J.L. Gevertz** and P.S. Kim, 2015. Treatment strategies for combining immunostimulatory oncolytic virus therapeutics with dendritic cell injections. *Mathematical Biosciences and Engineering* **12**(6): 1237-1256.
- **J.L. Gevertz**, Z. Aminzare, K. Norton, J. Pérez-Velázquez, A. Volkening and K.A. Rejniak, 2015. Emergence of anti-cancer drug resistance: Exploring the importance of the microenvironmental niche and tumor heterogeneity through a spatial model. In "Applications of Dynamical Systems in Biology and Medicine", *IMA Volumes in Mathematics and its Applications*, vol 158, Springer-Verlag, A. Radunskaya and T. Jackson (Eds).
- **J.L. Gevertz**, 2012. Optimization of vascular-targeting drugs in a computational model of tumor growth. *Physical Review E* **85**: 041914.
- **J.L. Gevertz**, 2011. Computational modeling of tumor response to vascular-targeting therapies - Part I: Validation. *Computational and Mathematical Methods in Medicine* **2011**: 830515.
- **J.L. Gevertz** and S. Torquato, 2009. Growing heterogeneous tumors in silico. *Physical Review E* **80**: 051910.
- **J.L. Gevertz**, G. Gillies and S. Torquato, 2008. Simulating tumor growth in confined heterogeneous environments. *Physical Biology* **5**: 036010.
- **J.L. Gevertz** and S. Torquato, 2008. A novel three-phase model of brain tissue microstructure. *PLoS Computational Biology* **4**(8): e1000152.
- **J.L. Gevertz** and S. Torquato, 2006. Modeling the effects of vasculature evolution on early brain tumor growth. *Journal of Theoretical Biology* **243**(4): 517-531.

- **J.L. Gevertz**, S. Dunn and C.M. Roth, 2005. Mathematical model of real-time PCR kinetics. *Biotechnology and Bioengineering* **92**(3): 346-355.
- **J. Gevertz**, H.H. Gan and T. Schlick, 2005. In vitro RNA random pools are not structurally diverse: A computational analysis. *RNA* **11**(6): 853-863.

Mathematics Pedagogy (Refereed)

- **J.L. Gevertz**, P.S. Kim and J.R. Wares, 2017. Mentoring undergraduate interdisciplinary mathematics research students: junior faculty experiences. *Problems, Resources, and Issues in Mathematics Undergraduate Studies* **27**: 352-369.
- J.C. Beier, **J.L. Gevertz** and K.E. Howard, 2015. Building context with tumor growth modeling projects in differential equations. *Problems, Resources, and Issues in Mathematics Undergraduate Studies* **25**: 297-325.

Other Computational Work (Refereed)

- **J.L. Gevertz** and S. Torquato, 2009. Mean survival time of absorbing triply periodic minimal surfaces. *Physical Review E* **80**: 011102.

Invited Book Chapters

- J. Perez-Velazquez, **J.L. Gevertz**, A. Karolak and K.A. Rejniak, 2016. Microenvironmental Niches and Sanctuaries: A Route to Acquired Resistance. *Advances in Experimental Medicine and Biology* **936**: 149-164.
- **J.L. Gevertz**, 2016. Microenvironment-Mediated Modeling of Tumor Response to Vascular-Targeting Drugs. *Advances in Experimental Medicine and Biology* **936**: 191-208.

Under Review and In Progress

- J.M. Greene, **J.L. Gevertz** and E.D. Sontag. A mathematical approach to differentiate spontaneous and induced evolution to drug resistance during cancer treatment. *Under review* (submitted April 2018). bioRxiv 235150; doi: https://doi.org/10.1101/235150.
- **J.L. Gevertz** and J.R. Wares. Developing a minimally-structured mathematical model: immuno-enhanced oncolytic viruses with dendritic cell vaccines. *Under review* (submitted May 2018).

TEACHING EXPERIENCE

The College of New Jersey Fall 2009 - present

- Differential Equations
- Seminar in Applied Mathematics: Dynamical Systems
- Applied Mathematics Senior Capstone
- Mathematical Biology
- Business Calculus (taught face-to-face and blended)
- Calculus B
- Numerical Methods
- Calculus A
- Linear Programming

Rutgers University Fall 2003 - Summer 2009

- Calculus 2
- Precalculus (Teaching Assistant)

Princeton University Spring 2007 - Fall 2008

- New Math Teacher Training Course (Co-Teacher)
- Advanced Physical Chemistry (Assistant in Instruction)

UNDERGRADUATE MENTORING EXPERIENCE

- Christopher Kouba (Applied Mathematics) and Abhin Shah (Mathematics), *Mathematical Simplifications of a Hybrid Spatial Model of Cancer Drug Resistance*, Fall 2017 - Spring 2018
- Rebecca Santorella (Applied Mathematics), *Multiscale Modeling of Macroscopic-Level Tumor Response to Stochastic Intracellular Signaling*, Fall 2015 - Spring 2017
- Syndi Barish (Applied Mathematics and Biology), *Treatment Strategies for Combining Immunostimulatory Oncolytic Virus Therapeutics with Dendritic Cell Injections*, Spring 2015 - Spring 2016
- Ami Shah (Biology), *Optimizing Solid Tumor Treatment with a DNA Damaging Drug in the Face of Pre-Existing or Acquired Resistance*, Fall 2014 - Spring 2015
- Daniel Chawla (Biology), *A Computational Model of Tumor Growth and Microenvironment-Driven Invasion*, Spring 2014 - Spring 2015
- Tyler Higgins (Applied Mathematics and Chemistry), *Predicting Ternary Equilibria: A Comparison between Algebraic and Kinetic Models*, Fall 2013 - Spring 2014
- Archana Patel (Mathematics), *Pharmacokinetic/Pharmacodynamic Model of Tumor Response to a Cytotoxic Drug*, Fall 2013 - Spring 2014
- Jessica Perez (Applied Mathematics), *Continuous and Discrete Modeling of Tumor Growth and Invasion*, Summer 2013
- Sarah Hirsh (Biology), *A Computational Model of Vasculogenesis*, Spring - Summer 2013
- Warren Jagger (Applied Mathematics), *Mathematical Model of Tumor-Immune System Interactions*, Summer 2012
- Kayla Spector (Physics), *A Mathematical Model of Tumor Growth in Variable-Density Environments*, Summer 2012, Spring 2013

SELECTED PRESENTATIONS

Invited Talks at Conferences and Workshops

- Workshop on Mathematical Models in Cancer, Wolfgang Pauli Institute, Vienna Austria, July 2018 (forthcoming)
- Workshop for Women in Mathematical Biology, Institute for Mathematics and its Applications, Minneapolis MN, May 2018
- 32nd Annual Moravian Student Mathematics Conference (keynote speaker), Bethlehem PA, February 2018
- Society for Mathematical Biology Conference, Salt Lake City UT, July 2017
- SIAM Conference on the Life Sciences, Boston MA, July 2016
- Workshop on Mathematical Oncology VI – The Interplay of Theory, Experiment and Clinical Practice, Fields Institute, Toronto Canada, April 2016
- Mathematical Association of America – NJ Meeting, Union NJ, November 2015
- Mathematical Methods in Systems Biology, Dublin Ireland, June 2015

- 9th European Conference on Theoretical & Mathematical Biology, Gothenburg Sweden, June 2014
- 6th International Symposium on Biomathematics and Ecology: Education and Research (BEER-2013), Arlington VA, October 2013
- Society for Mathematical Biology Conference, Tempe AZ, June 2013
- MathFest, Pittsburgh PA, August 2010

Colloquium/Seminar Talks

- Sidney Kimmel Comprehensive Cancer Center at Johns Hopkins University, Research Program in Quantitative Sciences Seminar, September 2018 (forthcoming)
- Sanofi (Bridgewater, NJ), Interdisciplinary Pharmacometrics Program Seminar, May 2017
- The Cancer Institute of New Jersey, Center for Systems and Computational Biology Seminar, June 2016
- New York University, Biomathematics/Computational Biology Colloquium, April 2016
- University of Richmond, Department of Mathematics Seminar, March 2016
- Moffitt Cancer Center, Integrative Mathematical Oncology Seminar, September 2015
- Helmholtz Zentrum München, Institute of Computational Biology Seminar, July 2014
- New Jersey Institute of Technology, Mathematical Biology Seminar, April 2014
- Rutgers University, Computational and Applied Mathematics Seminar, April 2014
- University of Texas at Austin, Association for Women in Mathematics Seminar, November 2013
- Virginia Commonwealth University, Biomathematics Seminar, February 2013
- The College of New Jersey, School of Science Colloquium, February 2013
- The College of New Jersey, Department of Mathematics & Statistics Colloquium, February 2012
- The College of New Jersey, Department of Mathematics & Statistics Colloquium, February 2011
- Seton Hall University, Department of Mathematics Colloquium, October 2010
- Princeton University, Physics & Mathematics of Cancer Seminar, April 2010
- University of British Columbia, Mathematical Biology Seminar, October 2008

Contributed Talks or Posters at Conferences and Workshops

- Joint Mathematics Meetings, Seattle WA, January 2016
- Association for Women in Mathematics Research Symposium, Santa Clara CA, March 2013
- SIAM Conference on the Life Sciences, San Diego CA, August 2012
- Joint Mathematics Meetings, Boston MA, January 2012 (Joint with Dr. Julie Beier)
- International Congress on Industrial and Applied Mathematics, Vancouver Canada, July 2011
- AWM Workshop for Women Graduate Students and Recent PhDs at the Joint Mathematics Meetings, New Orleans LA, January 2011
- International Conference on Mathematical Biology, Vancouver Canada, July 2009
- Society for Mathematical Biology Conference, Toronto Canada, July 2008
- SIAM Conference on Mathematics for Industry, Philadelphia PA, October 2007
- Workshop for Young Researchers in Mathematical Biology, Columbus OH, March 2007
- DIMACS Workshop on Computational Tumor Modeling, Piscataway NJ, August 2006
- Biomedical Engineering Society Annual Fall Meeting, Philadelphia PA, October 2004

RESEARCH SUPPORT

External

- Funded speaker for the Women in Mathematical Biology Workshop at the Institute for Mathematics and its Applications, University of Minnesota, May 2018
- Travel Grant Recipient for the American Institute of Mathematics workshop on Tumor-Immune Dynamics, January 2015
- Travel Grant Recipient for the Mathematical Biosciences Institute workshop on Cancer and the Immune System, The Ohio State University, November 2014
- AWM-NSF Travel Grant Recipient for the 9th European Conference on Mathematical and Theoretical Biology, June 2014
- Travel Grant Recipient for the 6th International Symposium on Biomathematics and Ecology: Education and Research, October 2013
- Funded Research Group Co-Leader at the WhAM! Workshop at the Institute for Mathematics and its Applications, University of Minnesota, September 2013
- Travel Grant Recipient for the Mathematical BioSciences Problem-Solving Workshop, The Ohio State University, July 2012
- Travel Grant Recipient for the Association for Women in Mathematics Workshop for Women Graduate Students and Recent PhDs, January 2011
- Rutgers Mathematics REU, Summer 2004
- New York University School of Medicine Summer Undergraduate Research Fellow, Summer 2003

Internal (TCNJ-Specific)

- Support of Scholarly Activity (SOSA) Award, August 2018 - June 2020
- Support of Scholarly Activity (SOSA) Award, August 2016 - June 2018
- School of Science Mini-Grant, November 2015
- Gitenstein-Hart Sabbatical Prize, August 2015 - August 2016
- Support of Scholarly Activity (SOSA) Award, August 2014 - June 2015
- Mentored Undergraduate Summer Experience (MUSE) Award, Summer 2012 and 2013
- TCNJ Advancement Program (TAP) Travel Grant Recipient from the National Science Foundation ADVANCE Program, March and June 2013
- TCNJ Advancement Program (TAP) Mentoring Grant Recipient from the National Science Foundation ADVANCE Program, 2012 - 2013
- Support of Scholarly Activity (SOSA) Award, August 2012 - June 2014
- Support of Scholarly Activity (SOSA) Award, August 2010 - June 2012

ACADEMIC SERVICE

Service to Profession and the Community

- Reviewed articles for: *Journal of Theoretical Biology, Physical Biology, Physica A, Physiological Genomics*, *Physics in Medicine and Biology* (4 papers), *Chemistry Central Journal*, *Journal of Physics: Condensed Matter*, *Mathematical Medicine & Biology, AIP Advances, International Journal of Mathematics and Mathematical Sciences, Trends in Biotechnology, Mathematical Biosciences, BMC Bioinformatics, Journal of Physics D: Applied Physics, Computational and Mathematical Methods in Medicine, PLOS One, Problems, Resources, and Issues in Mathematics Undergraduate*

Studies, , Biomedical Physics & Engineering Express, PLoS Computational Biology, Bulletin of Mathematical Biology, Viruses, Understanding Complex Biological Systems (Springer), Scientific Reports, Mathematical Biosciences

- Associate Editor, *SIAM Undergraduate Research Online* (*SIURO*), January 2018 - present
- Speaker at Math League International Summer Tournament, July of 2016-2018
- Grant reviewer for Medical Research Council (UK medical funding agency), May 2017
- Co-organizer (with Karen Clark and Christina Lee): Minisymposium entitled "Varying Perspectives on a Mathematics Modeling Course" for the SIAM Conference on Applied Mathematics Education, Philadelphia PA, October 2016
- Co-organizer (with Jill Gallaher): Minisymposium entitled "Predicting Therapeutic Outcomes using Mathematical Models of Cancer" for the SIAM Conference on the Life Sciences, Boston MA, July 2016
- Doctoral thesis defense committee member for Zahra Aminzare, Department of Mathematics, Rutgers University, April 2014
- Co-organizer (with Jasmine Foo, Kevin Leder, Marc Ryser): Minisymposium entitled "Spatial Models in Cancer Biology" for the 9th European Conference on Mathematical and Theoretical Biology, Gothenburg Sweden, June 2014
- Co-Director (with Kaaren Finberg through 2016, and Rosemarie Gorini starting 2018): NJ-NExT (New Experiences in Teaching program sponsored by the Mathematical Association of America – NJ Section), March 2014 - present
- Triage Round Judge: Moody's Mega Math (M^3) Challenge, March of 2013 - 2015
- Book chapter reviewer for *Calculus: Early Transcendentals* by Jon Rogawski (W. H. Freeman/Macmillan), September 2013
- Organizing Committee: The College of New Jersey's Sonya Kovalevsky Day, March 2012
- Judge: Undergraduate Poster Session at the Joint Mathematics Meetings, January of 2010 - 2012
- Judge: Student Poster Session at the MAA-NJ Meeting, April 2011
- Co-organizer (with Leona Harris): Mathematical Biology Workshop at The College of New Jersey's Sonya Kovalevsky High School Day, March 2011
- Speaker: Bridge to Employment Summer Institute Program for Trenton High School Students, The College of New Jersey, July 2010
- Judge: Undergraduate Paper Presentations at MathFest, August 2010
- Judge: Association for Women in Mathematics Essay-Writing Contest on "Biographies of Contemporary Women in Mathematics", March 2010

Service at The College of New Jersey

- Undergraduate Honors Thesis Committee Member: Alina Kuvelkar (TCNJ), Spring 2018
- Member: Presidential Search Committee, August 2017 - March 2018
- Faculty Representative to the Board of Trustees, August 2016 - present
- Member: Faculty Senate, (elected): May 2014 - May 2015; May 2016 - May 2017
  (ex officio): May 2017 - present
  Member: Faculty Senate Executive Board, August 2016 - present
- Member: Committee on Faculty Affairs (CFA), August 2014 - June 2015; August 2016 - June 2017
  Chair: Disciplinary Standards Subcommittee of CFA, January 2015 - June 2015
- Member: Applied Mathematics Committee, August 2010 - May 2013, August 2016 - present

Chair from August 2016 - June 2017

- Member: Applied Mathematics Search Committee, Fall 2016
- Member: Mathematics Committee, August 2016 - present
- Member: Department of Mathematics & Statistics Promotions and Reappointment Committee, September 2014 – May 2015, September 2016 - present
- Member: Mathematics & Statistics Program Review Committee, September 2014 - June 2015
- Member: Mathematics & Statistics Recruitment Committee, September 2014 - June 2015
- Member: Celebration of Women in Science Organizational Committee, Fall 2014
- Department Liaison: Mathematical Association of America and Association for Women in Mathematics, 2011 - present
- Academic Advisor: For 14-22 mathematics majors or minors per year, 2010 - present
- Co-Chair (with Danielle Guarracino): School of Science Colloquium Committee, 2011 - 2014
- Member: Teaching and Learning Program Council (TLPC), 2011 - 2014
  Chair: Learning Communities Subcommittee of TLPC, 2012 - 2013
- Member: Mathematics & Statistics Curriculum Committee, 2013 - 2014
- Member: Mathematics Faculty Search Committee, 2013
- Member: Biomedical Engineering Faculty Search Committee, 2012 - 2013
- Undergraduate Honors Thesis Committee Member: Edward Lee (TCNJ), Spring 2012
- Member: Department of Mathematics & Statistics Honors Committee, Spring 2012
- Student Application Reviewer: Phi Beta Kappa, February of 2010 - 2015
- Advisor: TCNJ Mathematics & Statistics Club, 2011 - 2013
- Vice Chair: Honors and Scholars Program Council, 2010 - 2011
- Member: Biomedical Engineering Faculty Search Committee, 2009 - 2010
- Member: Mathematics Committee, 2009 - 2010