

# Marisa C. Eisenberg

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RESEARCH INTERESTS *mathematical epidemiology, parameter identifiability and estimation, infectious diseases, global health, cancer, networks, and algebraic approaches in biology*

EDUCATION & APPOINTMENTS **Associate Professor** Departments of Epidemiology and Mathematics, University of Michigan, Ann Arbor, 2018–present.

**Assistant Professor** Departments of Epidemiology and Mathematics, University of Michigan, Ann Arbor, 2012–2017. Part of the UM Interdisciplinary Cluster Hiring Program in *The Diversity and Complexity of Biological Networks*.

**Postdoctoral Fellow** Mathematical Biosciences Institute, Ohio State University, 2009–2012.

**PhD, MS Biomedical Engineering** (Biocybernetics) University of California, Los Angeles, 2009.

**BS Cybernetics** University of California, Los Angeles, 2003.

GRANTS & FUNDING

## Current Federal Grants

2014–2019 NIH Grant U01 CA182915-01A1 (Eisenberg/Meza), “From Mechanism to Population: Modeling HPV-related Oropharyngeal Carcinogenesis.”  
*Role: Principal Investigator (Multiple)*

2011–2017 NSF EEID Grant 1115881 (Tien/Eisenberg/Fisman), “Modeling the effects of heterogeneity in water quality on cholera disease dynamics.”  
*Role: Co-Principal Investigator*

2014–2019 NIH MIDAS Grant U01 GM110712-01 (J. Eisenberg), “Modeling the Effects of the Environment on Enteric Pathogen Dynamics.”  
*Role: Co-Investigator*

2014–2019 NIH MIDAS Grant U54 GM111274-01 (Halloran), “Center for Statistics and Quantitative Infectious Diseases.”  
*Role: Co-Investigator*

## Current Non-Federal Grants

2016–2017 UM Cancer Center Pilot Grant (Eisenberg), “Examining the connections between cervical and oral HPV infection patterns.”  
*Role: Principal Investigator*

2016–2018 GOJO Industries Grant (Aiello/Eisenberg), “Innovative Approaches to Healthy Hand Hygiene Behavior.”  
*Role: Principal Investigator (Multiple)*

**Previous Grants**

- 2015–2016 NIH Grant R56 AG048937 (Mendes de Leon), “Dynamic Social Network Structures in Aging: A Complex Systems Approach.”  
*Role: Co-Investigator*
- 2014–2016 WHO Grant 485861-01 (Koopman), “Strategies to Guide the Polio Eradication Endgame.”  
*Role: Co-Investigator*
- 2014–2016 Procter and Gamble Award (Rickard), “Exploring Dental Biofilm Community Architecture and Structure.”  
*Role: Co-Investigator*
- 2014–2015 University of Michigan Thai Studies Institute Grant (Eisenberg), “Understanding Climate and Vector Drivers of Dengue in Thailand.”  
*Role: Principal Investigator*
- 2013–2015 University of Michigan M-Cubed Award (Eisenberg/Meza/Carey), “Oral High-Risk HPV and the Risk of Oral and Pharyngeal Cancer.”  
*Role: Principal Investigator (Multiple)*
- 2013–2014 University of Michigan Global Public Health Institute Grant (Eisenberg), “Modeling Cholera Transmission and Vaccination in a Refugee Camp: Water, the Environment, and Social Structure.”  
*Role: Principal Investigator*
- 2013–2014 CDC Grant U01CK000185 Aiello, “A Randomized Study of Exclusion Criteria in a University Population.”  
*Role: Co-Investigator*

## PUBLICATIONS

**Submitted and In Revision** (Current and former students/mentees/advises marked in *italics*)

1. *Brouwer AF*, **Eisenberg MC**, Love NG, Eisenberg JNS. Persistence-infectivity trade-offs in environmentally transmitted pathogens change population-level disease dynamics. Submitted.
2. *Brouwer AF\** and **Eisenberg MC\***. The underlying connections between identifiability, active subspaces, and parameter space dimension reduction. Submitted. (\*co-corresponding)
3. *Brouwer AF*, **Eisenberg MC**, Carey TE, Meza R. Multisite HPV infections in the United States: concordance and trends by gender (NHANES 2003 – 2014). Submitted.
4. **Eisenberg MC\***, *Campredon LP*, *Brouwer AF*, Walline, HM, Marinelli BM, Lau YK, Thomas TB, *Sullivan TS*, *Yost ML*, Goudsmit CM, Carey TE, Meza R\*. Dynamics and Determinants of HPV Infection: The Michigan HPV and Oropharyngeal Cancer (M-HOC) Study. Submitted. (\*equal co-authorship)
5. *Brouwer AF*, **Eisenberg MC**, Eisenberg JNS. Beyond disease surveillance data: developing best practices for expanding infectious disease models. Submitted.

6. French DA, **Eisenberg MC**, Nance T, and Teymuroglu Z. Analytical and Computational Study of an Individual-Based Network Model for the Spread of Heavy Drinking. Submitted.
7. *Brouwer AF*, **Eisenberg MC**, Meza R. Connecting etiological agent prevalence to cancer incidence: Cases studies of gastric, lung, and oral cancer. Submitted.
8. Lopez VK, Man O, Berrocal VJ, Jones AD, Fleischer, NL, **Eisenberg MC**, Eisenberg JNS. The EcoSaN Study: A Child Cohort Examining Latrine Use Behavior and Its Influence on Child Health and Wellbeing. Submitted.
9. Luo TL, **Eisenberg MC**, Hayashi M, Gonzalez-Cabezas C, Foxman B, Marrs CF, Rickard AH. A Sensitive Thresholding Method for Confocal Laser Scanning Microscope Image Stacks of Microbial Biofilms. Submitted.
10. *Hayashi MAL* and **Eisenberg MC**. Changing Burial Practices Explain Temporal Trends in the 2014 Ebola Outbreak. Submitted.
11. **Eisenberg MC**, Eisenberg JNS, *D'Silva JP*, Wells EV, *Cherng S*, *Kao YH*, Meza R. Forecasting and Uncertainty in Modeling the 2014-2015 Ebola Epidemic in West Africa. Submitted.
12. *Kao YH* and **Eisenberg MC**. Practical Unidentifiability of a Widely Used Vector-borne Disease Model: Ramifications for Parameter Estimation and Intervention Assessment. In Revision.
13. *Gicquelais R*, Foxman B, Coyle J, and **Eisenberg MC**. Insights into Hepatitis C Transmission in Young Persons who Inject Drugs: Results From a Dynamic Modeling Approach Informed by State-Level Public Surveillance Data. In Revision.
14. *Hayashi MAL*, **Eisenberg MC**, and Eisenberg JNS. Usability, Compliance, and Household Water Treatment Effectiveness. In Revision.
15. *Blanco N*, Walk S, Malani AN, Rickard A, Benn M, **Eisenberg MC**, Zhang M, Foxman B. *Clostridium difficile* shows no trade-off between toxin and spore production within the human host. In Revision.

#### Published, Accepted, and In Press

16. Ryser MD, Gulati R, **Eisenberg MC**, Shen Y, Hwang ES, Etzioni R. 2018. Identification of the fraction of indolent tumors and associated overdiagnosis in breast cancer screening trials. *American Journal of Epidemiology*, Accepted.
17. Greene C, Hernandez Ceron N, **Eisenberg MC**, Koopman J, Xi C, and Eisenberg JNS. 2017. Measuring bi-directional bacterial transfer efficiencies: impact on model parameterization. *American Journal of Infection Control*, Accepted.
18. *Petrie JG*, **Eisenberg MC**, Ng S, Malosh RE, Lee KH, Ohmit SE, and Monto AS. 2017. Application of an Individual-Based Transmission Hazard Model for Estimation of Influenza Vaccine Effectiveness in a Household Cohort. *American Journal of Epidemiology*, In Press, <https://doi.org/10.1093/aje/kwx217>.
19. *Blanco N*, Foxman B, Malani AN, Zhang M, Walk S, Rickard A, and **Eisenberg MC**. 2017. An *in silico* evaluation of treatment regimens for recurrent *Clostridium difficile* infection. *PLOS ONE*, 12(8): e0182815.

20. **Eisenberg MC\*** and Jain HV\*. 2017. Data and Identifiability in Models of Cancer Chemotherapy: a Confidence Building Exercise. *Journal of Theoretical Biology*, 431: 63-78. (\*Equal contribution)
21. *D'Silva JP* and **Eisenberg MC**. 2017. Modeling spatial transmission of Ebola in West Africa. *Journal of Theoretical Biology*, 428:65-75.
22. Koopman JS, Henry CJ, Park JH, **Eisenberg MC**, Ionides EL, Eisenberg JNS. 2017. Dynamics Affecting the Risk of Silent Circulation When Oral Polio Vaccination Is Stopped. *Epidemics*, 20C: 21-36.
23. Pongsakul T, Sudsom N, *Foakes G*, *Bhatt K*, **Eisenberg MC**, Siriyasatien P. Molecular DNA identification of blood sources fed on, for Culicine mosquitoes (Diptera: Culicidae) collected in the Songkhla province, southern Thailand. *Songklanakarin Journal of Science and Technology*, 39 (6): 1-7.
24. *Brouwer AF*, Weir MH, **Eisenberg MC**, Meza R, and Eisenberg JNS. Dose-response Relationships for Environmentally Mediated Infectious Disease Transmission Models. *PLOS Computational Biology* 13(4): e1005481.
25. *Brouwer AF*, Meza R, and **Eisenberg MC**. 2017. Parameter estimation for multistage clonal expansion models from cancer incidence data: a practical identifiability analysis. *PLOS Computational Biology*, 13(3): e1005431.
26. *Brouwer AF*, **Eisenberg MC**, Remais JV, Collender PA, Meza R, Eisenberg JNS. 2017. Modeling biphasic environmental decay of pathogens and implications for risk analysis. *Environmental Science and Technology*, 51 (4), 2186 - 2196.
27. *Lee EC*, *Kelly MR*, *Ochocki BM*, *Akinwumi SM*, *Hamre KE*, Tien JH, and **Eisenberg MC**. 2017. Model distinguishability and inference robustness in mechanisms of cholera transmission and loss of immunity. *J. Theoretical Biology*, 420: 68-81.
28. Bell SA, Munro-Kramer M, **Eisenberg MC**, Lori J. 2017. "Ebola Kills Generations": Qualitative interviews with Liberian healthcare providers. *Midwifery* 45: 44-49.
29. *Brouwer AF*, Meza R, and **Eisenberg MC**. 2016. A systematic approach to determining the identifiability of multistage carcinogenesis models. *Risk Analysis*, doi:10.1111/risa.12684.
30. *Blanco-Herrera N*, **Eisenberg MC** (co-corresponding), Stillwell T, Foxman B. 2016. What Transmission Precautions Best Control Influenza Spread in a Hospital? *American Journal of Epidemiology* 183(11): 1045-1054.
31. *Walch OJ* and **Eisenberg MC**. 2016. Parameter identifiability and identifiable combinations in generalized Hodgkin-Huxley models. *Neurocomputing* 199:137-143.
32. *Han SX*, **Eisenberg MC**, Larsen PR, DiStefano JJ. 2016. THYROSIM App for Education and Research Predicts Potential Health Risks of Over-the-Counter (OTC) Thyroid Supplements. *Thyroid* 26(4): 489-498.
33. *Brouwer AF*, **Eisenberg MC**, Meza R. 2016. Age effects and temporal trends in HPV-related and HPV-unrelated oral cancer in the United States: A multistage carcinogenesis modeling analysis. *PLOS One* 11(3): e0151098.

34. Kelly M, Tien J, **Eisenberg MC**, Lenhart S. 2016. The impact of spatial arrangements on epidemic disease dynamics and intervention strategies. *Journal of Biological Dynamics* 10(1): 222-249.
35. Aiello AE, Simanek AM, **Eisenberg MC**, Walsh AR, Davis B, Volz E, Cheng C, Rainey JJ, Uzicanin A, Gao H, Osgood N, Knowles D, Stanley K, Tarter K, Monto AS. 2016. Design and Methods of a Social Network Isolation Study for Reducing Respiratory Infection Transmission: The eX-FLU Cluster Randomized Trial. *Epidemics* 15:38-55.
36. Hayashi MAL and **Eisenberg MC**. 2016. Effects of Adaptive Protective Behavior on the Dynamics of Sexually Transmitted Infections. *J. Theoretical Biology*, 388: 119-130.
37. Brouwer AF, **Eisenberg MC**, Carey TE, Meza RM. 2015. Trends in HPV cervical and seroprevalence and analysis of multisite (oral, genital, sero) concurrence and type-concordance in NHANES 2003 – 2010. *BMC Infectious Diseases*, 15:575.
38. Krishna N, Pennington H, Coppola C, **Eisenberg MC**, Schugart R. 2015. Connecting Local and Global Sensitivities for a Mathematical Model in Wound Healing. *Bulletin of Mathematical Biology*, 77(12): 2294-2324.
39. Meshkat N, Sullivant S, and **Eisenberg MC**. 2015. Identifiability results for several classes of linear compartment models. *Bulletin of Mathematical Biology*, 77 (8): 1620-1651.
40. Brouwer AF, Meza R, and **Eisenberg MC**. 2015. Transmission Heterogeneity and Autoinoculation in a Multisite Infection Model of HPV. *Mathematical Biosciences*, 270(A):115-125.
41. Fan K, **Eisenberg MC**, Walsh AR, Aiello AE, Heller K. 2015. Hierarchical Graph-Coupled HMMs on Heterogeneity and Personalized Health. KDD '15 Proceedings of the 21th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining, 239-248.
42. Greene C, Vadlamudi G, **Eisenberg MC**, Foxman B, Koopman J, and Xi C. 2015. Fomite-Fingerpad Transfer Efficiency (pick-up and deposit) of *Acinetobacter baumannii* With and Without a Latex Glove. *American Journal of Infection Control*, 43(9):928 – 934.
43. Alexander KA, Sanderson CE, Marathe M, Lewis BL, Rivers CM, Shaman J, Drake JM, Lofgren E, Dato VM, **Eisenberg MC**, Eubank S. 2015. What factors might have led to the emergence of Ebola in West Africa? *PLOS Neglected Tropical Diseases*, 9(6):e0003652.
44. Tien JH, Shuai Z, **Eisenberg MC**, van den Driessche P. 2015. Disease invasion on community networks with environmental pathogen movement. *J. Mathematical Biology* 70(5): 1065-1092.
45. Lofgren L, Halloran ME, Rivers CM, Drake JM, Porco TC, Lewis B, Yang W, Vespignani A, Shaman J, Eisenberg JNS, **Eisenberg MC**, Marathe M, Scarpino SV, Alexander KA, Meza R, Ferrari MJ, Hyman JM, Meyers LA, Eubank S. 2014. Opinion: Mathematical models: A key tool for outbreak response. *PNAS* 111(51): 18095-18096.

46. Halloran EM, Vespignani A, Bharti N, Feldstein LR, Alexander K, Ferrari M, Shaman J, Drake JM, Porco T, Eisenberg J, DeValle S, Lofgren E, Scarpino SV, **Eisenberg MC**, Gao D, Hyman JM, Eubank S, Longini IM. 2014. Ebola: Mobility Data. *Science* 346 (6208): 433.
47. **Eisenberg MC** and *Hayashi MAL*. 2014. Determining Structurally Identifiable Parameter Combinations Using Subset Profiling. *Mathematical Biosciences* 256: 116 – 126.
48. **Eisenberg MC**, Kujbida G, Tuite AR, Fisman DN, Tien JH. 2013. Examining rainfall and cholera dynamics in Haiti using statistical and dynamic modeling approaches. *Epidemics* 5(4): 197 – 207.
49. Robertson SL, **Eisenberg MC**, Tien JH. 2013. Heterogeneity in multiple transmission pathways: modeling the spread of waterborne disease in networks with a common water source. *J. Biological Dynamics* 7(1): 254-275.
50. **Eisenberg MC**, Shuai Z, Tien JH, van den Driessche P. 2013. A Cholera Model in a Patchy Environment with Water and Human Movement. *Math Biosciences* 246(1): 105-112.
51. **Eisenberg MC**, Robertson S, Tien J. 2013. Identifiability and estimation of multiple transmission pathways in cholera and waterborne disease. *J. Theoretical Biology* 324: 84-102.
52. *Ben-Shachar R*, **Eisenberg MC** (corresponding), Huang SA, DiStefano JJ. 2012. Simulation of post thyroidectomy treatment alternatives for T3 or T4 replacement in pediatric thyroid cancer patients. *Thyroid* 22(6):1-9.
53. **Eisenberg MC**, Kim Y, Li R, Ackerman WE, Kniss DA, Friedman A. 2011. Mechanistic modeling of the effects of myoferlin on tumor cell invasion. *Proceedings of the National Academy of Sciences (PNAS)* 108(50): 20078-20083.
54. **Eisenberg MC**, Ash JN, Siegal-Gaskins D. 2011. *In silico* synchronization of cellular populations through expression data deconvolution. *Proceedings of the ACM/IEEE Design Automation Conference (DAC)* 2011. (Reprint available at <http://arxiv.org/abs/1105.0955>)
55. Tuite RA, Tien J, **Eisenberg MC**, Earn JDJ, Ma J, Fisman DN. 2011. Cholera Epidemic in Haiti, 2010 – Using a Transmission Model to Explain Spatial Spread of Disease and Identify Optimal Control Interventions. *Annals of Int Med* 154(9): 593-601.
56. **Eisenberg MC**, Santini F, Marsili A, Pinchera A, DiStefano JJ. 2010. TSH Regulation Dynamics In Central & Extreme Primary Hypothyroidism. *Thyroid* 22(11): 1215-1228.
57. Meshkat NC, **Eisenberg MC**, DiStefano JJ. 2009. Algorithm for finding globally identifiable parameter combinations and reparameterizations of nonlinear ODE models using Gröbner Bases. *Math Biosciences*, 222:61-72.
58. **Eisenberg MC**, DiStefano JJ. 2009. TSH-based protocol, tablet instability, and absorption effects on L-T4 bioequivalence. *Thyroid* 19(2): 103-110.

59. **Eisenberg MC**, Samuels MH, DiStefano JJ. 2008. Extensions, Validation & Clinical Applications of a Feedback Control System Simulator of the Hypothalamic-Pituitary-Thyroid Axis. *Thyroid* 18(10): 1071-1085.
60. **Eisenberg MC**, Samuels MH, DiStefano JJ. 2006. L-T4 Bioequivalence and Hormone Replacement Studies Via Feedback Control Simulations. *Thyroid* 16(12): 1279-1292.

TEACHING  
EXPERIENCE

**Introduction to Mathematical Modeling in Epidemiology & Public Health (Epid 633)**, University of Michigan, Ann Arbor (2013 – present). An introduction to math modeling in epidemiology, with examples drawn broadly from infectious disease, chronic disease, and social epidemiology.

**Scientific Writing for Epidemiologists (Epid 530)**, University of Michigan, Ann Arbor (2014 – 2015). An introduction to scientific writing and communication, required course for Epidemiology MPH students.

**Systems Modeling of Social Processes, Behavior, and Chronic Disease (Epid 637)**, University of Michigan, Ann Arbor (Fall 2013). Complex systems modeling of chronic diseases and social behavior processes, using agent-based, network models, and differential equation models.

**NC State Tutorial Workshop: Parameter Estimation for Dynamic Biological Models** (Summer 2014, 2016). Lecturer for a tutorial workshop on parameter estimation at NC State.

**NIMBioS Tutorial Workshop: Parameter Estimation for Dynamic Biological Models** (Summer 2014). A three-day tutorial based at the National Institute for Mathematical and Biological Synthesis, University of Tennessee.

**NIMBioS Tutorial Workshop on Uncertainty Quantification** (Summer 2017). A three-day tutorial based at the National Institute for Mathematical and Biological Synthesis, University of Tennessee.

**MBI-NIMBioS-CAMBAM Summer Graduate Program: Connecting Models with Data in Mathematical Biology** (Summer 2013, 2017). A two-week summer graduate program in modeling methods.

**Michigan Math & Science Scholars Program** (Summer 2013). Guest lecturer for advanced high school program for students in mathematical biology.

**Foundations of Higher Mathematics (Math 345)**, The Ohio State University (Fall 2010). this course introduces students (primarily math majors) to basic proof techniques, logic, and set theory.

**Mathematical Ecology & Evolution, MBI Summer Graduate Workshop** (Summer 2011). Mentored graduate students on projects in mathematical epidemiology and patch models in waterborne disease for the MBI-NIMBioS-CAMBAM Graduate Summer School (together with Joe Tien).

**MBI Bootcamp on Cancer Modeling** (Fall 2010). Developed and lead labs on VEGF receptor binding and apoptosis for the signaling pathways tutorial (together with Harsh Jain).

**Nonlinear Dynamics in Biological Networks, McGill University** (Summer 2010). Developed and taught a series of labs and research projects on symmetry and networks for the joint CAMBAM/MBI Graduate Summer School (together with Marty Golubitsky and Yunjiao Wang).

**Project Leader, Calculus for Life Sciences (Math 150)**, The Ohio State University (Fall 2009, Fall 2010). Mentored a small group of students in a calculus project on enzyme-substrate dynamics.

**Lead Instructor, UCLA Junior Math Circle** (2008-2009). Lead instructor for the new UCLA Junior Math Circle (grades K-3); also instructor and mentor for advanced high school, junior high, and elementary school students at the weekly UCLA Math Circle.

**Teaching Assistant/Fellow and Guest Lecturer at UCLA** (2004-2009)

Physical Biochemistry (Chemistry 156)	3 quarters
Intro. to Computational & Systems Biology (CS 186A)	1 quarter
Modeling and Simulation of Biological Systems (CS 186B)	4 quarters
Comp. & Systems Biology Research Lab (CS 186L)	4 quarters
Advanced Modeling Methodology (CS 296A)	1 quarter

**Julia Robinson Mathematics Festival, UCLA** (2009). activity leader for chess-board tilings table. The festival is a one-day annual mathematical event for students grades 6-12.

## PRESENTATIONS & SEMINARS

### Recent Seminars and Invited Presentations (2016 – present)

- ICMA VI: Sixth International Conference on Mathematical Modeling and Analysis of Populations in Biological Systems, 2017 – Identifiability and Uncertainty in Modeling Disease Dynamics (**Invited talk**)
- Fields Institute Conference on Big Data and Information Analytics, 2017 – Identifiability and Parameter Estimation in Modeling Epidemic Dynamics (**Invited talk**)
- Society for Industrial and Applied Mathematics (SIAM) Conference on Applied Algebraic Geometry, 2017 – Structural and Practical Identifiability in Multistage Clonal Expansion Models of Cancer (**Invited talk**)
- Society for Mathematical Biology Annual Meeting, 2017 – Identifiability and Uncertainty in Modeling Disease Dynamics (**Invited talk**)
- Mathematical Biosciences Institute - Research Experience for Undergraduates Seminar, 2017 – Identifiability and Parameter Estimation in Modeling Disease Dynamics (**Invited talk**)
- Society for Industrial and Applied Mathematics (SIAM) Conference on Applications of Dynamical Systems, 2017 – Identifiability and Parameter Estimation in Modeling Biological Dynamics



- Association for Women in Mathematics Annual Meeting, 2017 – Identifiability and Parameter Estimation in Modeling Disease Dynamics (**Invited talk**)
- Symposium on Parameter Estimation and Uncertainty Quantification for Dynamical Systems, University of Pittsburgh, 2017 – Identifiability and Parameter Estimation in Modeling Disease Dynamics (**Invited talk**)
- Fifth Midwest Women in Mathematics Symposium, 2017 – Identifiability and Parameter Estimation in Modeling Disease Dynamics (**Invited talk**)
- Arizona State University Mathematics Department Colloquium, 2017 – Comparing structural and practical identifiability in multistage models of cancer (**Invited talk**)
- Mathematical Biosciences Institute, Workshop on Population Models in the 21st Century, 2016 – Connecting models with data: identifiability and parameter estimation of multiple transmission pathways
- Santa Clara University Mathematics Department Colloquium, 2016 – Identifiability of Hodgkin-Huxley Models (**Invited talk**)
- UM DCMB Seminar, 2016 – Identifiability and Parameter Estimation in Modeling Disease Dynamics
- Arizona State University Mathematical Biology Seminar, 2016 – Math in the time of cholera: forecasting and uncertainty in modeling cholera dynamics (**Invited talk**)
- Arizona State University Mathematics Department Colloquium, 2016 – Identifiability and Parameter Estimation in Modeling Disease Dynamics (**Invited talk**)
- NIH Cancer Systems Biology Consortium and Physical Sciences Oncology Network Annual Meeting, 2016 – From Mechanism to Population: Modeling HPV-Related Oropharyngeal Carcinogenesis
- 11th AIMS Conference on Dynamical Systems, Differential Equations and Applications, 2016 – Interacting Scales in Modeling HPV and Oropharyngeal Cancer (**Invited talk**)
- 11th AIMS Conference on Dynamical Systems, Differential Equations and Applications, 2016 – Identifiability of Multistage Clonal Expansion Models in Cancer (**Invited talk**)
- 10th European Conference on Mathematical and Theoretical Biology and Society for Mathematical Biology Annual Meeting, 2016 – Connecting models with data: identifiability and parameter estimation of multiple transmission pathways
- Math Bio Symposium, St. Olaf’s College, 2016 – Math in the Time of Cholera: Mathematical Modeling in Public Health (**Invited keynote**)
- Math Bio Seminar, Duke University, 2016 – Forecasting and Uncertainty in Modeling Disease Dynamics (**Invited talk**)
- University of North Carolina, Chapel Hill, 2016 – Introduction to the Opo Sensor
- Timmy Global Health/M-HEAL Symposium, University of Michigan, 2016 – Math in the Time of Cholera: Using Models to Understand and Predict Disease Spread (**Invited keynote**)

PROFESSIONAL  
MEMBERSHIPS

Center for the Study of Complex Systems, University of Michigan (CSCS)  
 UM Comprehensive Cancer Center, Cancer Epidemiology and Prevention Section  
 Center for Systems Biology, University of Michigan  
 Michigan Institute for Computational Discovery and Engineering  
 Michigan Institute for Data Science  
 Professional Societies: Society for Industrial and Applied Mathematics, Society for  
 Mathematical Biology, Association for Women in Mathematics

REVIEWING,  
ORGANIZATION,  
SERVICE, &  
PROFESSIONAL  
DEVELOPMENT**Minisymposia and Workshop Organization**

- Organizer & Lecturer for the NIMBioS Tutorial Workshop on Uncertainty Quantification, National Institute for Mathematical and Biological Synthesis, University of Tennessee, 2017.
- Co-Organizer, Workshop on Population Models in the 21st Century, Mathematical Biosciences Institute, The Ohio State University, 2016.
- Co-Organizer, Advancing Precision Medicine through Complex Systems Biology Symposium, University of Michigan, 2016.
- Organizer & Lecturer for the NIMBioS Tutorial Workshop: Parameter Estimation for Dynamic Biological Models, National Institute for Mathematical and Biological Synthesis, University of Tennessee, 2014.
- Discussion leader for Mathematical Biosciences Institute Workshop on Sustainable Management of Living Natural Resources, Ohio State University 2013.
- Organizer & Lecturer for the 2013 NIMBioS-MBI-CAMBAM Summer Graduate Program: Connecting Models with Data in Mathematical Biology.
- Organizer for the 2011 Workshop for Young Researchers in Mathematical Biology, held at the Mathematical Biosciences Institute
- Organizer for minisymposium entitled, “Bridging the Divide: Cancer Models in Clinical Practice,” for the 8th European Conference on Mathematical and Theoretical Biology (2011)

**Advisory Panels and Reviewing**

- Member of the Steering Committee for the NIH Models of Infectious Disease Agent Systems (MIDAS) Network (2014-present)
- Advisory Panel Member for the Malaria Host-Pathogen Interaction Center (Malaria Host Pathogen Working Group), based at Emory University, Georgia Tech, and University of Georgia (2013-2017)
- Reviewer, Proc. Royal Society Series B, Journal of Mathematical Biosciences, Mathematical Medicine & Biology, American Naturalist, Health Education & Behavior, Frontiers in Molecular & Cellular Oncology, Thyroid, Journal of Pharmacy & Pharmacology, PLOS One, etc.
- Grant Reviewer for NSF/NIH, the US-Israel Science Foundation, and the University of Missouri