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Education:

2001-2005: B.S., Chemical Engineering, University of Oklahoma, OK
2005-2012: Ph.D., Chemical Engineering, University of Illinois at Urbana-Champaign, IL
2012-2014: Postdoctorate, Chemical Engineering, Massachusetts Institute of Technology, MA

Academic Appointments:

2005-2012: Research Assistant, University of Illinois at Urbana-Champaign
2007: Visiting Scientist, Computational Science Center, Brookhaven National Laboratory
2012-2014: Postdoctoral Associate, Massachusetts Institute of Technology
2012-present: Assistant Professor, School of Chemical Engineering, Oklahoma State University (OSU)
2014-present: Investigator, OSU Interdisciplinary Toxicology Program
2014-present: Member, Harold Hamm Diabetes Center, University of Oklahoma Health Sciences Center
2015-present: Investigator, Oklahoma Center for Respiratory and Infectious Diseases

Honors and Awards:

2019: NSF CAREER Award

2017: AIChE 35 Under 35
2017: College of Engineering, Architecture, and Technology Excellent Teacher Award
2017: ASEE Chemical Engineering Summer School Poster Award
2016: Outstanding Poster Presentation, New York Academy of Sciences Symposium on Chronic Kidney Disease
2015: Outstanding Mentor, College of Engineering, Architecture and Technology Student Council, Oklahoma State University
2014: Joseph J. Martin Award for best paper in Chemical Engineering Division at American Society for Engineering Education Annual Meeting 2013
2013: Frederick A. Howes Scholar in Computational Science
2006-2010: Department of Energy Computational Science Graduate Fellowship
2006: National Science Foundation Graduate Research Fellowship (declined)
2005: Outstanding Chemical Engineering Senior, College of Engineering, University of Oklahoma
2004: Tau Beta Pi Engineering Honor Society
2001-2005: Oklahoma Regents Scholar, Oklahoma State Regents for Higher Education, University of Oklahoma

Research Support:

Current

- 2019-2024: NIH R35 NIGMS MIRA, "Quantitative Systems Biomedicine and Pharmacology for Multiscale Tissue Damage", Awarded: $1,834,680, Role: PI

- 2019-2024: National Science Foundation CAREER Award, "CAREER: Multiscale Modeling of a Virtual Kidney during the Onset and Progression of Diabetic Kidney Disease", Awarded: $550,000, Role: PI
- 2017-2020: Oklahoma Center for the Advancement of Science and Technology (OCAST), "Computational Modeling of the Onset of Diabetic Kidney Disease," Awarded: $135,000, Role: PI

Previous

- 2016-2017: OCRID Pilot Project, "Computational Modeling of Tuberculosis Granuloma Activation," Awarded: $50,000, Role: PI
- 2015-2016: Harold Hamm Diabetes Center, "Mathematical Modeling of Podocytes in Diabetic Kidney Disease," Awarded: $45,000, Role: PI

Selected Publications:

1. Y. T. Nguyen Edalgo, A. L. Zornes, and A. N. Ford Versypt, "A Hybrid Discrete-Continuous Model of Metastatic Cancer Cell Migration through a Remodeling Extracellular Matrix," AIChE Journal, 65(9):e16671, 2019. DOI: 10.1002/aic.16671.
2. A. N. Ford Versypt, "Self-Evaluation and Reflection for Professional Development of Chemical Engineering Students," Chemical Engineering Education, 53(3), 157–161, 2019.
3. M. R. Pilvankar, H. L. Yong, and A. N. Ford Versypt, "A Glucose-Dependent Pharmacokinetic/Pharmacodynamic Model of ACE Inhibition in Kidney Cells," Processes, 7(3), 131, 2019. DOI: 10.3390/pr7030131 Cover article:https://www.mdpi.com/2227-9717/7/3.
4. J. D. Crall*, B. L. de Bivort, B. Dey*, and A. N. Ford Versypt*, "Social Buffering of Pesticides in Bumblebees: Agent-Based Modeling of the Effects of Colony Size and Neonicotinoid Exposure on Behavior within Nests," Frontiers in Ecology and Evolution, 7, 51, 2019. DOI: 10.3389/fevo.2019.00051.
5. C. V. Eastep, G. K. Harrell, A. N. McPeak, and A. N. Ford Versypt, "A MATLAB App to Introduce Chemical Engineering Design Concepts to Engineering Freshmen through a Pharmaceutical Dosing Case Study," Chemical Engineering Education, 53(2), 85–90, 2019.
6. J. D. Crall, C. M. Switzer, R. L. Oppenheimer, A. N. Ford Versypt, B. Dey, A. Brown, M. Eyster, C. Guerin, N. E. Pierce, S. A. Combes, and B. L. de Bivort, "Neonicotinoid Exposure Disrupts Bumblebee Nest Behavior, Social Networks, and Thermoregulation," Science, 362(6415), 683–686, 2018. DOI: 10.1126/science.aat1598 Highlighted in perspective article: N. E. Raine, "Pesticide Affects Social Behavior of Bees," Science, 362, 643–644, 2018. DOI: 10.1126/science.aav5273. Mentioned in 73 news stories in 69 news outlets including NPR and C&EN.
7. A. N. Ford Versypt, J. D. Crall, and B. Dey, "BeeNestABM: An Open-Source Agent-based Model of Spatiotemporal Distribution of Bumblebees in Nests," Journal of Open Source Software, 3(27), 718, 2018. DOI: 10.21105/joss.00718.
8. Y. T. Nguyen Edalgo and A. N. Ford Versypt, "Mathematical Modeling of the Metastatic Cancer Migration through a Remodeling Extracellular Matrix," Processes, 6(5), 58, 2018. DOI: 10.3390/pr6050058 Cover article:https://www.mdpi.com/2227-9717/6/5.
9. S. M. Ruggiero*, J. Zhao*, and A. N. Ford Versypt, "Building a MATLAB Graphical User Interface to Solve Ordinary Differential Equations as a Final Project for an Interdisciplinary Elective Course on Numerical Computing," Journal of Computational Science Education, 9(1), 19–28, 2018. DOI: 10.22369/issn.2153-4136/9/1/3.
10. M. R. Pilvankar, M. A. Higgins, and A. N. Ford Versypt, "Mathematical Model for Glucose Dependence of the Local Renin-Angiotensin System in Podocytes," Bulletin of Mathematical Biology, 80(4), 880–905, 2018. DOI: 10.1007/s11538-018-0408-4.
11. S. A. Irfan, R. Razali, K. KuShaari, N. Mansor, B. Azeem, and A. N. Ford Versypt, "A Review of Mathematical Modeling and Simulation of Controlled-Release Fertilizers," Journal of Controlled Release, 271, 45–54, 2018. DOI: 10.1016/j.jconrel.2017.12.017.
12. A. N. Ford Versypt, "Choose Your Own Kinetics Adventure: Student-Designed Case Studies for Chemical Reaction Engineering Course Projects," Transactions on Techniques for STEM Education, 3, 48–56, 2017.
13. S. M. Ruggiero*, M. R. Pilvankar*, and A. N. Ford Versypt, "Computational Modeling of Tuberculosis Granuloma Activation," Processes, 5(4), 79, 2017. DOI: 10.3390/pr5040079.
14. A. N. Ford Versypt, G. K. Harrell, and A. N. McPeak, "A Pharmacokinetic/Pharmacodynamic Model of ACE Inhibition of the Renin-Angiotensin System for Normal and Impaired Renal Function," Computers & Chemical Engineering, 104, 311–322, 2017 https://doi.org/10.1016/j.compchemeng.2017.03.027.
15. G. K. Harrell, A. N. McPeak, and A. N. Ford Versypt, "A Pharmacokinetic Simulation-Based Module to Introduce Mass Balances and Chemical Engineering Design Concepts to Engineering Freshmen," Proceedings of the ASEE Annual Conference, Columbus, OH, 2017.

16. A. N. Ford Versypt, "Self-Reflection Assignments for Evaluating Non-Technical Skills and Setting Goals for Professional Development," Proceedings of the ASEE Annual Conference, Columbus, OH, 2017.
17. A. E. Lu, J. A. Paulson, N. J. Mozdzierz, A. Stockdale, A. N. Ford Versypt, K. J. Love, J. C. Love, and R. D. Braatz, "Control Systems Technology in the Advanced Manufacturing of Biologic Drugs," Proceedings of the IEEE Conference on Control Applications, Sydney, Australia, 1505–1515, 2015. DOI: 10.1109/CCA.2015.7320824.
18. A. N. Ford Versypt, P. D. Arendt, D. W. Pack, and R. D. Braatz, "Derivation of an Analytical Solution to a Reaction-Diffusion Model for Autocatalytic Degradation and Erosion in Polymer Microspheres," PLoS ONE, 10, e01035506, 2015. DOI: 10.1371/journal.pone.0135506.
19. J. C. Arciero, L. Ellwein, A. N. Ford Versypt, E. Makrides, and A. T. Layton, "Modeling Blood Flow Control in the Kidney," T. Jackson, A. Radunskaya (eds.), Applications of Dynamical Systems in Biology and Medicine, The IMA Volumes in Mathematics and its Applications 158, Springer, New York, 55–74, 2015. DOI: 10.1007/978-1-4939-2782-1_3.
20. A. N. Ford Versypt, E. Makrides, J. C. Arciero, L. Ellwein, and A. T. Layton, "Bifurcation Study of Blood Flow Control in the Kidney," Mathematical Biosciences, 263, 169–179, 2015. DOI: 10.1016/j.mbs.2015.02.015.
21. A. N. Ford Versypt and R. D. Braatz, "Analysis of Finite Difference Discretization Schemes for Diffusion in Spheres with Variable Diffusivity," Computers and Chemical Engineering, 71, 241–252, 2014. DOI: 10.1016/j.compchemeng.2014.05.022.
22. A. Mesbah, A. N. Ford Versypt, X. Zhu, and R. D. Braatz, "Nonlinear Model-Based Control of a Thin-Film Dryer for Continuous Pharmaceutical Manufacturing," Industrial and Engineering Chemistry Research, 53, 7447– 7460, 2014. DOI: 10.1021/ie402837c.
23. J. J. Versypt and A. N. Ford Versypt, "Mapping Rural Students' STEM Involvement: Case Studies of Chemical Engineering Undergraduate Enrollment in the States of Illinois and Kansas," Proceedings of the ASEE Annual Conference, Atlanta, GA, 2013. http://www.asee.org/public/conferences/20/papers/7257/view. Recognized as outstanding paper by the ASEE Chemical Engineering Division Joseph J. Martin Award.
24. A. N. Ford Versypt, D. W. Pack, and R. D. Braatz, "Mathematical Modeling of Drug Delivery from Autocatalytically Degradable PLGA Microspheres—A Review," Journal of Controlled Release, 165, 29–37, 2013. DOI: 10.1016/j.jconrel.2012.10.015.
25. M. Kishida, A. N. Ford Versypt, D. W. Pack, and R. D. Braatz, "Optimal Control of 1D Cellular Uptake in Tissue Engineering," Optimal Control Applications and Methods, 34, 680–695, 2013. DOI: 10.1002/oca.2047.
26. M. Jiang, M. H. Wong, Z. Zhu, J. Zhang, L. Zhou, K. Wang, A. N. Ford Versypt, T. Si, L. Hasenberg, Y. E. Li, and R. D. Braatz, "Towards Achieving a Flattop Crystal Size Distribution by Continuous Seeding and Controlled Growth," Chemical Engineering Science, 77, 2–9, 2012. DOI: 10.1016/j.ces.2011.12.033.
27. A. N. Ford, D. W. Pack, and R. D. Braatz, "Multi-Scale Modeling of PLGA Microparticle Drug Delivery Systems," Proceedings of the 21st European Symposium on Computer Aided Process Engineering (ESCAPE-21), Chalkidiki, Greece, 1475–1479, 2011.
28. M. Kishida, A. N. Ford, D. W. Pack, and R. D. Braatz, "Optimal Control of Cellular Uptake in Tissue Engineering," Proceedings of the American Control Conference, Seattle, WA, 2118–2123, 2008. 10.1109/ACC.2008.4586805.
29. A. N. Ford and D. V. Papavassiliou, "Flow around Surface-Attached Carbon Nanotubes," Industrial and Engineering Chemistry Research, 45, 1797–1804, 2006. DOI: 10.1021/ie050932h.